CITY OF MORGAN HILL

Regular Meeting Agenda

Planning Commission

LIAM DOWNEY	-	*CHAIR*
PAUL LAKE	-	*VICE-CHAIR*
MOHAMMAD HABIB	-	*PLANNING COMMISSIONER*
MALISHA KUMAR	-	*PLANNING COMMISSIONER*
JAMES WILSON	-	*PLANNING COMMISSIONER*
JOSEPH MUELLER	-	*PLANNING COMMISSIONER*
WAYNE TANDA	-	*PLANNING COMMISSIONER*

Tuesday, January 14, 2025 7:00 PM

Council Chamber Building
17555 Peak Avenue, Morgan Hill, CA 95037

MEETING PARTICIPATION

Morgan Hill Planning Commission meetings are held in person. The community may attend in person or via Zoom (video/teleconference). The meetings are also live-streamed on the City's website, Facebook page, and Channel 17.

Those wishing to participate in the meetings remotely must register in advance at https://bit.ly/PlanningCommissionMtg. Additionally, Zoom participants must be running the latest version or will be required to update to the latest version before being able to join the meeting remotely.

Remote participation is also available by calling (669) 900-9128 and entering webinar id: 862 0324 6251#. Dial *9 to raise your hand, and be called upon to speak for up to 3 minutes. Dial *6 to unmute.

As a courtesy, and technology permitting, for members who attend online, the City cannot guarantee that the public's access to online technology will be uninterrupted, and technical difficulties may occur from time to time. Unless required by the Ralph M. Brown Act, the meeting will continue despite technical difficulties for participants using the online option.

PUBLIC COMMENT

Public comment may be offered verbally at the meeting or in writing before the meeting.

Those attending remotely may only offer public comment for items on the agenda in any of these three categories:

- Consent Calendar
- Other Business
- Public Hearings

Public comment will be heard from those attending in person first with the submission of a speaker card. Once that is complete, we will move to those on Zoom that have their hand raised. Following public comment from Zoom, we will close the public comment period for that item.

Remote public comment for items not on the agenda will not be accepted.

Written public comment may be submitted to the Planning Office:

- In person at the Planning Commission Meeting;
- Via email to pcpubliccomment@morganhill.ca.gov; or
- Hand delivered or mailed to the Planning Division at 17575 Peak Avenue, Morgan Hill, CA 95037

Please email your comments to the Planning Office no later than 3:00 p.m. on Monday (the day before the Planning Commission meeting) so that your comments can be submitted to the members of the Planning Commission with sufficient time to review them. You may continue to provide written comments up to noon on Tuesday (the day of the meeting), although Planning Commissioners may not have sufficient time to review them before the meeting. Public comments submitted to the Planning Division after noon (12:00 p.m.) the day of the meeting will be provided to the Planning Commission as time allows.

Written comments WILL NOT be read aloud during the Planning Commission Meeting. Please note that written comments are posted on the City's website. It is recommended that you do not include any personal information that you do not want to be posted on the web. Please be advised that communications directed to the Planning Commission are public records and are subject to disclosure pursuant to the California Public Records Act and Brown Act unless exempt from disclosure under the applicable law. Communications will NOT be edited for redactions and will be printed/posted as submitted.

AMERICANS WITH DISABILITIES ACT (ADA)

In compliance with the Americans with Disabilities Act, if you are a disabled person and you need a disability-related modification or accommodation to participate in this meeting, please contact the Planning Office at (408) 310-4709 or by email at planning@morganhill.ca.gov. Requests must be made as early as possible and at least two full business days before the start of the meeting.

CALL TO ORDER

ROLL CALL ATTENDANCE

DECLARATION Of POSTING

Pursuant to Government Code Section 54954.2

PLEDGE OF ALLEGIANCE

PUBLIC COMMENT

Members of the public are entitled to address the Planning Commission concerning any item within the Morgan Hill Planning Commission's subject matter jurisdiction. Public comments are limited to no more than three minutes. Except for certain specific exceptions, the Commission is prohibited from discussing or taking action on any item not appearing on the posted agenda. (See additional noticing at the end of this agenda)

ORDERS OF THE DAY

PUBLIC HEARINGS

1. **SD2022-0002/EA2022-0009: Watsonville - Blackrock (Quail Meadows): Request for a Tentative Subdivision Map of an existing 18.54-acre site for the development of 14 single-family detached residential lots with the completion of Secretariat Way (public street) to Watsonville Road and other associated site improvements.**

   Recommendation:

   1. Open/Close the public hearing;
   2. Adopt a Resolution approving a Mitigated Negative Declaration with Mitigation Monitoring Report Program; and
   3. Adopt a Resolution approving the Tentative Subdivision Map for the future development of a single-family detached residential project consisting of 14 custom lots.

DIRECTOR'S REPORT/ANNOUNCEMENTS

ADJOURNMENT

NOTICE

Any documents produced by the City and distributed to the majority of the Planning Commission less than 72 hours prior to an open meeting, will be made available for public inspection at the front counter at City Hall located at 17575 Peak Avenue, Morgan Hill, CA, 95037 and at the Morgan Hill Public Library located at 660 West Main Avenue, Morgan Hill, California, 95037 during normal business hours. (Pursuant to Government Code 54957.5)

PUBLIC COMMENT

Members of the Public are entitled to directly address the Planning Commission concerning any item that is described in the notice of this meeting, before or during consideration of that item. If you wish to address the Planning Commission on any issue that is on this agenda, please complete a speaker request card located in the foyer of the Council Chambers and deliver it to the Minutes Clerk prior to discussion of the item. You are not required to give your name on the speaker card in order to speak to the Planning Commission, but it is very helpful. When you are called, proceed to the podium and the Chair will recognize you. If you wish to address the Planning Commission on any other item of interest to the public, you may do so during the public comment portion of the meeting following the same procedure described above. Please limit your comments to three (3) minutes or less.

Please submit written correspondence to the Minutes Clerk, who will distribute correspondence to the Planning Commission.

Persons interested in proposing an item for the Planning Commission agenda should contact a member of the Commission who may plan an item on the agenda for a future Commission meeting. Should your comments require Planning's action, your request may be placed on the next appropriate agenda. Planning Commission discussion or action may not be taken until your item appears on an agenda. This procedure is in compliance with the California Public Meeting Law (Brown Act) Government Code §54950.

City Council Policies and Procedures (CP 03-01) outlines the procedure for the conduct of public hearings. Notice is given, pursuant to Government Code Section 65009, that any challenge of Public Hearing Agenda items in court, may be limited to raising only those issues raised by you or on your behalf at the Public Hearing described in this notice, or in written correspondence delivered to the Commission at, or prior to the Public Hearing on these matters.

The time within which judicial review must be sought of the action by the Commission, which acted upon any matter appearing on this agenda is governed by the provisions of Section 1094.6 of the California Code of Civil Procedure.

For a copy of Commission Policies and Procedures CP 97-01, please contact the City Clerk's office (408) 779-7259, (408) 779-3117 (fax) or by email cityclerk@morganhill.ca.gov.

CITY OF MORGAN HILL

PLANNING COMMISSION STAFF REPORT
MEETING DATE: January 14, 2025

PREPARED BY:
Tiffany Brown, Associate Planner
APPROVED BY: Jennifer Carman

SD2022-0002/EA2022-0009: WATSONVILLE - BLACKROCK (QUAIL MEADOWS): REQUEST FOR A TENTATIVE SUBDIVISION MAP OF AN EXISTING 18.54-ACRE SITE FOR THE DEVELOPMENT OF 14 SINGLE-FAMILY DETACHED RESIDENTIAL LOTS WITH THE COMPLETION OF SECRETARIAT WAY (PUBLIC STREET) TO WATSONVILLE ROAD AND OTHER ASSOCIATED SITE IMPROVEMENTS.

RECOMMENDATION(S)

1. Open/Close the public hearing;
2. Adopt a Resolution approving a Mitigated Negative Declaration with Mitigation Monitoring Report Program; and
3. Adopt a Resolution approving the Tentative Subdivision Map for the future development of a single-family detached residential project consisting of 14 custom lots.

LOCATION MAP/PROJECT INFORMATION:

1.	Location:	Located on the southwest corner of Watsonville Road and Santa Teresa Boulevard at 14905 Santa Teresa Boulevard (APN: 779-02-023)
2.	Site Area:	18.54-Acres
3.	General Plan:	Residential Estate
4.	Zoning:	Residential Estate 1-acre lots (RE-1)
5.	Request:	Tentative Subdivision Map for 14 - costume home lots

BACKGROUND:

On June 6, 2018, the City Council adopted Ordinance No. 2277, approving a comprehensive update to Title 18 (Zoning), including an amendment to the City's Official Zoning Map. The update re-designated the project site from Residential Estate 40,00 square foot lots to Residential Estate one-acre minimum lots, which provides consistency with the General Plan designation.

California Senate Bill 330 (SB330) established the "Housing Crisis Act of 2019", effective January 1, 2020, making changes to the local approval process. The law supersedes City requirements/standards and suspended the City's Residential Development Control System (RDCS). RDCS was the housing development tool the City utilized for nearly 40 years prior to the new legislation. This Bill allows the project to move forward without RDCS approval.

On July 8, 2022, an application was submitted for a Tentative Subdivision Map to establish a 14-lot custom home development that includes the completion of Secretariat Way and associated on-site and off-site improvements.

PROJECT DESCRIPTION:

The project site is approximately 18.54-acres located on the southwest corner of Watsonville Road and Santa Teresa Boulevard. The topography of the site is relatively flat with Llagas Creek located along the southwest corner of the site. The site is currently developed with a single-family residence constructed circa 1966, a detached garage constructed circa 1955, and the Barney Machado Barn constructed circa 1883. The Barney Machado Barn is part of the Santa Clara County Heritage Resource Inventory list and the Morgan Hill Local registry. A Historic Resources Evaluation with Archaeological Study was completed by Evan & De Shazo, Inc. for the proposed subdivision and how that relates to the Barn and property. The evaluation concluded that the Barney Machado Barn and property do not meet the standards required to stay on the historical resources lists. However, the applicant proposed the Barney Machado Barn remain and reside within Lot 5 of the proposed Tentative Subdivision Map. The remaining structures and pool will be demolished to accommodate for the future 14-lot subdivision with single-family detached units for each residential lot. The proposed residences would be clustered around Secretariat Way and a new cul-de-sac (Court A). The project would maintain a setback of at least 100-feet from top of bank of Llagas Creek. The extension of Secretariat Way and Court A would be within a 48-foot public right-of-way and would provide 18-feet of travel lane, six feet of landscaping, and five-foot-wide sidewalks in accordance with City standards. New curbs, gutters, and sidewalks would be included along the internal roadways. As part of the proposed project, the 46-foot Watsonville Road public right-of-way within the project boundaries would be repaved and reconfigured and include a 12-foot-wide travel lane, 18-foot-wide buffer, six-foot-wide bicycle lane, curbs, and continuous with-foot-wide meandering sidewalks.

Prior to the development of the property, the applicant will be required to file a Final Map with on/off-site Improvement Agreement, an administrative Design Permit for the 14 new homes, and obtain the required building and encroachment permits.

Surrounding Uses

	General Plan Land Use	Zoning	Existing Use
North	Unincorporated, Rural County	Unincorporated, Rural County	Single Family Residences
South	Unincorporated County Land	Unincorporated County Land	Llagas Creek and Single-Family Residences
East	Residential Detached Medium / Residential Estate (1-acre)	Residential Detached Medium (7,000) / Residential Estate (1-acre)	Single Family Residences
West	Unincorporated, Rural County	Unincorporated, Rural County	Single Family Residences

PROJECT ANALYSIS AND FINDINGS:

ANALYSIS

The proposed project was analyzed with respect to conformance with: 1) Morgan Hill 2035 General Plan; 2) Zoning Ordinance with Subdivision Findings and 3) California Environmental Quality Act:

1. General Plan Land Use Consistency

The Residential Estate General Plan Landuse Designation is intended to promote and encourage a suitable environment for families living on relatively large parcels of land (minimum one-acre lots) allowing single-family homes, accessory dwellings, appropriate agricultural uses. The project as proposed is requesting 14 new lots with a minimum of one acre per lot. Each lot intended to be developed with a single-family home. The proposal is consistent with the following General Plan policies:

Policy CNF -9.1, Density Feathering from High to Low Densities. Encourages feathering from higher urban densities to lower rural densities to occur within the City limits. Feathering should begin as development nears the Urban Growth Boundary.

The project site is located in between Residential Detached Medium to the east with Residential Estate to the southeast and Unincorporated Rural County to the north, west, and south. The proposal provides a feathered transition by developing Residential Estate minimum one acre lots consistent with the General Plan landuse designation.

Policy CNF-10.4, Single-Family Housing Supply. Support actions to maintain an adequate supply of single-family housing throughout the community, including provisions of affordable single-family housing to those persons who work within the community.

The proposed subdivision would allow for the future development of 14 single family housing units and will be consistent with the City's Inclusionary Housing Ordinance by paying the affordable housing in-lieu fee to support the future production of affordable housing.

Policy CNF-11.3, Appropriate Residential Transitions. Provide for an acceptable transition in lot size and density between adjacent residential areas.

The project proposes consistency with the Residential Estate one-acre lot land use designation and proposes the appropriate transitional land use between the adjacent residential Detached Medium, Residential Estate, and Unincorporated Rural County land.

2. Zoning and Subdivision Ordinance Consistency

The proposed map meets the development standard lot width, length, and square footage minimums for the Residential Estate minimum one-acre lot zoning designation. The purpose of the Subdivision Ordinance is to ensure consistency with the Subdivision Map Act, the Morgan Hill General Plan, and Morgan Hill Zoning Standards. In approving or conditionally approving a Tentative Subdivision Map, the Planning Commission shall find the following:

Finding:

That the proposed subdivision, together with its provisions for its design and improvements, is consistent with applicable general or specific plans adopted by the city.

The Subdivision as proposed is consistent with the General Plan and meets all development standards for the zoning designation. The General Plan anticipated this type of growth at this location and shows that the city has adequate infrastructure to support the new development.

CONCLUSION:

The project as proposed was found to be consistent with the General Plan and Zoning Ordinance. The project site has previously been anticipated for the development of single-family homes. The increase in water demand, wastewater generation, and stormwater drainage associated with the project will be adequately accommodated by the existing facilities and will not require major expansion or extension of existing water, wastewater, electrical, or telecommunications facilities in the project area.

CEQA (California Environmental Quality Act):

An initial study was completed, consistent with the CEQA and a Mitigated Negative Declaration (MND) was prepared with the associated Mitigation Monitoring Report Program (MMRP). The study and MND conclude that with mitigation the project with all components will not individually or cumulatively substantially degrade the quality of the environment, reduce habitat of fish or wildlife species, threaten to eliminate plant or animal community including rare or endangered species. Nor would the project have substantial adverse effects on human beings, directly or indirectly. For more information about each mitigation refer to the attached Mitigation Monitoring Report Program.

COMMUNITY ENGAGEMENT:

The proposed project was publicly noticed (mailing to property owners within 600-feet of the project site and newspaper legal noticing) for the minimum 10-day period and a sign was posted on the project site pursuant to the Plannng Division requirements.

ATTACHMENTS:

1. Resolution, MND and MMRP
2. Quail Vineyards Erratum
3. Quail Vineyards Initial Study / Mitigated Negative Declaration
4. Quail Vineyards Mitigation Monitoring Report Program
5. Resolution, Tentative Subdivision Map
6. Tentative Subdivision Map

RESOLUTION NO. 25-01

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORGAN HILL APPROVING THE MITIGATED NEGATIVE DECLARATION AND THE MITIGATION MONITORING AND REPORTING PROGRAM PREPARED IN ACCORDANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT FOR THE QUAIL VINEYARDS (ALSO KNOW AS QUAIL MEADOWS AND WATSONVILLE – BLACKROCK) PROJECT (EA2022-0009)

WHEREAS, prior to the adoption of this Resolution, the Planning Division of the City of Morgan Hill prepared an Initial Study and a Mitigated Negative Declaration for the Quail Vineyards Project (SD2022-0002/EA2022-0009) in accordance with the requirements of the California Environmental Quality Act of 1970, as amended ("CEQA"), and state and local guidelines implementing CEQA; and

WHEREAS, the Quail Vineyards Project analyzed under the Initial Study/Mitigated Negative Declaration consists of the request for a 14-lot residential tentative map subdivision for a custom lot single family homes on an 18.54-Acre site located on the southwest corner of Watsonville Road and Santa Teresa Boulevard at 14905 Santa Teresa Boulevard (APN:779-02-023), and

WHEREAS, in connection with the approval of the project involving the preparation of an Initial Study/Mitigated Negative Declaration that identifies one or more significant environmental effects, CEQA requires the decision-making body of the lead agency to incorporate feasible mitigation measures that would reduce those significant environmental effects to a less-than-significant level; and

WHEREAS, whenever a lead agency approves a project requiring the implementation of measures to mitigate or avoid significant effects on the environment, CEQA also requires a lead agency to adopt a Mitigation Monitoring and Reporting Program to ensure compliance with the mitigation measures during project implementation; and

WHEREAS, the City of Morgan Hill is the lead agency on the Project, the Planning Commission is the decision-making body for the proposed Project; and

WHEREAS, the Planning Commission has reviewed, considered, and recommended approval of the Initial Study/Mitigated Negative Declaration and related Mitigation Monitoring and Reporting Program for the Project at their January 14, 2025 meeting; and

WHEREAS, the Initial Study/Mitigated Negative Declaration and the Mitigation Monitoring and Reporting Program for the project are, by this reference, incorporated into this Resolution as if fully set forth herein and the MMRP attached as Exhibit A; and

WHEREAS, the Project will not individually or cumulatively have an adverse effect on wildlife resources, as defined in Section 89.5 of the California Department of Fish and Game Code.

NOW, THEREFORE BE IT RESOLVED BY THE PLANNING COMMISSIONOF THE CITY OF MORGAN HILL AS FOLLOWS:

SECTION 1: THAT THE PLANNING COMMISSION does hereby make the following findings**:**

(1) It has independently reviewed and analyzed the Initial Study/Mitigated Negative Declaration and other information in the record and has considered the information contained therein, prior to acting upon the Project;

(2) The Initial Study/Mitigated Negative Declaration prepared for the Project has been completed in compliance with CEQA and consistent with state and local guidelines implementing CEQA; and

(3) The Initial Study/Mitigated Negative Declaration represents the independent judgment and analysis of the City as lead agency for the Project. The Development Services Director of the Development Services Department at 17575 Peak Avenue, Morgan Hill, California 95037, is the custodian of documents and records of proceedings on which this decision is based.

(4) On the basis of the whole record before it (including the initial study and any comments received), there is no substantial evidence that the project will have a significant effect on the environment with the application of mitigation measures.

SECTION 2: THAT THE PLANNING COMMISSION does hereby adopt the Mitigation Monitoring and Reporting Program prepared for the Project. The Initial Study/Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program are: (1) on file in the Development Services Department, Planning Division, located at 17575 Peak Avenue, Morgan Hill CA 95037 and (2) available for inspection by any interested person.

PASSED AND ADOPTED THIS 14TH DAY OF JANUARY 2025, AT A REGULAR MEETING OF THE PLANNING COMMISSION BY THE FOLLOWING VOTE:

AYES: COMMISSIONERS:

NOES: COMMISSIONERS:

ABSTAIN: COMMISSIONERS:

ABSENT: COMMISSIONERS:

ATTEST:

_____

JENNA LUNA, Deputy City Clerk

APPROVED:

_____

LIAM DOWNEY , Chair

EXHIBIT "A"

MITIGATION MONITORING AND REPORTING PROGRAM

Quail Vineyards Project

File Numbers: EA2022-0009, SD2022-0002

January 14, 2025

CITY OF MORGAN HILL

The City of Morgan Hill, as Lead Agency under the California Environmental Quality Act (CEQA) and State CEQA Guidelines, has prepared the Final Mitigated Negative Declaration (MND) for the Quail Vineyards (also known as Quail Meadows and Watsonville – Blackrock) Project (proposed project). When a lead agency makes findings on significant effects identified in an MND, it must also adopt a program for reporting or monitoring mitigation measures that were adopted or made conditions of project approval (Public Resources Code [PRC] Section 21081.6[a]; State CEQA Guidelines Sections 15091[d], 15097).

This document represents the mitigation monitoring and reporting program (MMRP) prepared by the City of Morgan Hill for the proposed project. This MMRP includes all measures required to reduce potentially significant environmental impacts to a less-than-significant level. In addition, the MMRP identifies the timing of implementation; the agency responsible for implementing the mitigation; and the agency responsible for monitoring the mitigation. The mitigation measures, timing, and responsibility are summarized in Table 1. The implementation and monitoring of the mitigation measures, in conjunction with the implementation of the City's Standard Measures required for such projects, will ensure the reduction of potentially significant environmental effects to less-than-significant levels.

This MMRP has been prepared by the City of Morgan Hill, with technical assistance from Raney Planning & Management, Inc., an environmental consulting firm. Questions should be directed to Tiffany Brown, Senior Planner, at the City of Morgan Hill.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
Prior to Construction			
BIO-1 (IV-1): A southwestern pond turtle survey shall be conducted by a qualified biologist no more than 48 hours prior to construction in the portion of the project site where construction activities overlap within 100 feet of Llagas Creek. The results of the survey shall be submitted to the City of Morgan Hill Development Services Department. If southwestern pond turtles or nests are not found, further mitigation is not necessary. If a southwestern pond turtle is observed within the proposed impact area, a qualified biologist shall relocate the individual to habitat of equivalent or greater value (e.g., riparian wetlands or riparian woodlands adjacent to a perennial creek or intermittent drainage) outside of the proposed impact area prior to construction. If a southwestern pond turtle nest is observed within the proposed impact area, the nest shall be fenced off and avoided until the eggs hatch. The exclusion fencing shall be placed no less than 25 feet from the nest. A qualified biologist shall monitor the nest daily during construction to ensure that	Project Applicant with a Qualified Biologist	City of Morgan Hill Development Services Department	No more than 48 hours prior to construction in the portion of the project site where construction activities overlap within 100 feet of Llagas Creek.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
hatchlings do not disperse into the construction area. Relocation of hatchlings shall occur as stipulated above, if necessary.			
BIO-2 (IV-2): Initial ground-disturbing activities associated with development of the project site (e.g., grading, vegetation removal, staging) should take place between September 1 and March 31 (i.e., outside the colony active period) to avoid potential impacts on special-status bumblebees. If initial ground-disturbing activities does not occur between September 1 and March 31, then at a maximum of 14 days prior to the commencement of construction activities, a qualified biologist with 10 or more years of experience conducting biological resource surveys within California shall conduct a preconstruction survey for special-status bumblebees in the area(s) proposed for impact. The survey shall occur during the period from one hour after sunrise to two hours before sunset, with temperatures between 65 degrees Fahrenheit and 90 degrees Fahrenheit, with low wind and	Project Applicant with a Qualified Biologist	City of Morgan Hill Development Services Department	If initial ground-disturbing activities occur outside of September 1 through March 31, then a maximum of 14 days prior to commencement of construction activities, a preconstruction survey for special-status bumblebees shall be conducted.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
zero rain. If the timing of the start of construction makes the survey infeasible due to the temperature requirements, the surveying biologist shall select the most appropriate days based on the National Weather Service seven-day forecast and shall survey at a time of day that is closest to the temperature range stated above. The survey duration shall be commensurate with the physical extent of suitable floral resources (which represent foraging habitat) present within the area proposed for impact, and the level of effort shall be based on the metric of a minimum of one person-hour of searching per three acres of suitable floral resources/foraging habitat. A meandering pedestrian survey shall be conducted throughout the area proposed for impact in order to identify patches of suitable floral resources. Suitable floral resources for Crotch's bumblebee include species in the following families: Apocynaceae, Asteraceae, Boraginaceae, Fabaceae, and Lamiaceae. Suitable floral resources for western bumblebee include species in the following families: Asteraceae, Fabaceae, Rhamnaceae, and Rosaceae,			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
as well as plants in the genera Eriogonum and Penstemon. At a minimum, preconstruction survey methods shall include the following: • Search areas with floral resources for foraging bumblebees. Observed foraging activity may indicate a nest is nearby, and therefore, the survey duration shall be increased when foraging bumblebees are present; • If special-status bumblebees are observed, watch any special-status bumblebees present and observe their flight patterns. Attempt to track their movements between foraging areas and the nest; • Visually look for nest entrances. Observe burrows, any other underground cavities, logs, or other possible nesting habitat; • If floral resources or other vegetation preclude observance of the nest, small areas of vegetation may be removed via hand removal, line trimming, or mowing to a			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
height of a minimum of four inches to assist with locating the nest; • Look for concentrated special-status bumblebee activity; • Listen for the humming of a nest colony; and • If bumblebees are observed, attempt to photograph the individual and identify it to species. The biologist conducting the survey shall record when the survey was conducted, a general description of any suitable foraging habitat/floral resources present, a description of observed bumblebee activity, a list of bumblebee species observed, a description of any vegetation removed to facilitate the survey, and their determination of if survey observations suggest a special-status bumblebee nest(s) may be present or if construction activities could result in take of special-status bumblebees. The report shall be submitted to the Morgan Hill Development Services Department prior to the commencement of construction activities.			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
If bumblebees are not located during the preconstruction survey or the bumblebees located are definitively identified as a common species (i.e., not special-status species), then further mitigation or coordination with the California Department of Fish and Wildlife (CDFW) is not required. If any sign(s) of a bumblebee nest is observed, and if the species present cannot be established as a common bumblebee, then construction shall not commence until either (1) the bumblebees present are positively identified as common (i.e., not a special-status species), or (2) the completion of coordination with CDFW to identify appropriate mitigation measures, which may include, but not be limited to, waiting until the colony active season ends, establishment of nest buffers, or obtaining an Incidental Take Permit (ITP) from CDFW.			
BIO-3 (IV-3): Construction activities shall be scheduled to avoid the nesting season for most birds in Santa Clara County (February 1 through August 31). If	Project Applicant with a Qualified Biologist	City of Morgan Hill Development Services Department	If construction activities are scheduled to take place outside the nesting season (February 1 through August

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
construction activities are scheduled to take place outside the nesting season, all impacts to nesting birds protected under the MBTA and California Fish and Game Code would be avoided. If construction activities and/or tree removal are proposed during nesting season (February 1 to August 31), a preconstruction survey for nesting birds and other protected migratory birds shall be conducted by a qualified ornithologist, consistent with conditions set forth by the SCVHP to ensure that nests are not disturbed during project implementation. The survey shall be submitted to the City of Morgan Hill Development Services Department for review no more than seven days prior to the start of construction. The survey shall be conducted no more than seven days prior to the initiation of demolition or construction activities, including tree removal and pruning. During this survey, the ornithologist shall inspect all trees and other potential nesting habitats (e.g., trees, shrubs, ruderal grasslands, buildings) in and immediately adjacent to the impact areas			31), a preconstruction survey for nesting birds shall be conducted.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
for nests. If an active nest is observed during the survey, the ornithologist shall determine the extent of a construction-free buffer zone to be established around the nest (typically 300 feet for raptors and 100 feet for other species), to ensure that no nests of species protected by the MBTA and California Fish and Game Code shall be disturbed during project implementation.			
BIO-4 (IV-4): The project applicant shall obtain a Tree Removal Permit prior to the removal of any Ordinance Sized Trees as defined by the City. The project applicant shall mitigate for the removal of the Ordinance Sized Trees located within the project site, as identified in the Arborist Report prepared by Monk Smith Tree Specialists, Inc. for the proposed project, by providing an on-site replacement planting at a minimum 1:1 ratio with 15-gallon minimum size trees. For the Ordinance Sized Trees to be preserved as part of the project, the project applicant shall implement Tree Preservation Recommendations, including, but not limited to, the following	Project Applicant	City of Morgan Hill Development Services Department	The measures shall be included in the notes on construction drawings, prior to initiation of construction.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
• Include tree identification numbers, protection fence locations, and preservation and guidelines on all the project plans, or alternatively create a separate plan sheet that includes all tree protection measures labeled “T-1 Tree Protection Plan;” • Place a protection fence around the trees to be retained at a radius of eight times the diameter at breast height (DBH); • Install temporary irrigation or soaker hoses in the Tree Protection Zones (TPZs); • Monitor watering times or amounts to ensure adequate soil saturation; • All tree maintenance and care shall be performed by a qualified arborist with a C-61/D-49 California Contractors License. Tree maintenance and care shall be specified in writing according to American National Standard for Tree Care Operations: Tree, Shrub and Other Woody Plant Management: Standard Practices parts 1 through 10 and adhere to			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
ANSI Z133.1 safety standards and local regulations. All maintenance is to be performed according to ISA Best Management Practices; • Implement general tree protection guidelines including recommendations for arborist assistance while working under trees, trenching, or excavation within a tree's drip line or designated TPZ/Critical Root Zone (CRZ); • Provide a copy of the Arborist Report to all contractors and project managers, including the architect, civil engineer, and landscape designer or architect; and • Arrange a pre-construction meeting with the project arborist or landscape architect to verify tree protection is in place, with the correct materials, and at the proper distances. The above measures shall be included in the notes on construction drawings, subject to review and approval by the			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
City of Morgan Hill Development Services Department, prior to initiation of construction.			
BIO-5 (IV-5): Prior to issuance of a grading permit for the proposed project, the owner or designee shall pay the Santa Clara Valley Habitat Plan per-acre fee in effect for the appropriate fee zone of the project site, as determined by the Santa Clara Valley Habitat Agency, in compliance with Section 18.132.050 of the Morgan Hill Municipal Code.	Project Applicant	City of Morgan Hill Development Services Department	Prior to issuance of a grading permit.
GEO-1 (VII-1): Prior to approval of any grading permits, the project Civil Engineer shall show on the project plans that the project design adheres to all engineering recommendations provided in the site-specific Geologic Hazard Evaluation and Soil Engineering Study prepared for the proposed project by Earth Systems Pacific. Proof of compliance with all recommendations specified in the Geologic Hazard Evaluation and Soil Engineering Study shall be subject to review and approval by the City Engineer. The project plans shall include, but not be limited to, engineering recommendations	Project Applicant with a Civil Engineer	City of Morgan Hill Development Services Department City Engineer Qualified Geotechnical Engineer	Prior to approval of any grading permits.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
related to site preparation and grading, utility trench excavation, backfill, foundations, concrete slab-on-grade floors, exterior concrete flatwork, pavement areas, and project review and construction monitoring. The site demolition activities shall also specify that any trees; aboveground structures; and underground structures, such as abandoned utility and/or irrigation lines, septic tanks, and leach fields, encountered during demolition and construction shall be properly removed, all excavations left open for backfilling, and loose material created by the demolition of existing structures should be excavated and replaced as engineered fill.			
HAZ-1 (IX-1): Prior to issuance of a grading permit, the project applicant shall hire a licensed contractor to obtain the applicable abandonment permit from Santa Clara County Department of Environmental Health (SCCDEH) and the City of Morgan Hill, and properly abandon the on-site septic system for review and	Project Applicant and Licensed Contractor	Morgan Hill Building Division Santa Clara County Department of Environmental Health	Prior to issuance of a grading permit.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
approval by the SCCDEH and the City of Morgan Hill Building Division.			
HAZ-2 (IX-2): Prior to the issuance of a grading permit, a well permit shall be obtained from the Santa Clara Valley Water District (SCVWD) for the removal of the existing cistern-type water supply well. Following approval of the well permit, the well removal must be in accordance with County and State regulations and in cooperation with the SCVWD. Proof of compliance shall be submitted to the City of Morgan Hill Building Division.	Project Applicant and Licensed Contractor	Morgan Hill Building Division Santa Clara County Department of Environmental Health	Prior to issuance of a grading permit.
HAZ-3 (IX-3): Prior to issuance of a demolition permit for any on-site structure, the Developer shall consult with certified Asbestos and/or Lead Risk Assessors to complete a visual inspection/pre-demolition survey, and possible sampling, to determine whether any structures to be demolished contain lead-based paint (LBP), asbestos, mercury, or polychlorinated biphenyl caulk. Sampling shall be conducted in accordance with the California Department of Toxic Substances Control's 2006 Interim Guidance Evaluation of School Sites with Potential Contamination from Lead based Paint,	Project Applicant and Certified Asbestos and/or Lead Risk Assessor	Morgan Hill Building Division	Prior to issuance of a demolition permit.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
Termiticides, and Electrical Transformers. The report shall be submitted for review to the Building Department. If asbestos-containing materials or lead-containing materials are not discovered during the survey, further mitigation related to asbestos-containing materials or lead-containing materials shall not be required. If asbestos-containing materials and/or lead-containing materials are discovered by the survey, the project applicant shall prepare a work plan to demonstrate how all building materials containing LBP, asbestos, mercury, or polychlorinated biphenyl caulk shall be removed in accordance with current California Occupational Health and Safety Administration (Cal/OSHA) regulations and disposed of in accordance with all CalEPA regulations, prior to the demolition and/or removal of the on-site structures. The plan shall include the requirement that work shall be conducted by a Cal/OSHA registered asbestos and lead abatement contractor in accordance with Cal/OSHA Lead in Construction Standard Title 8, CCR 1529			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
and Title 8, CCR 1532.1 including employee training, employee air monitoring, and dust control. If asbestos is found, all construction activities shall comply with all requirements and regulations promulgated through the National Emission Standards for Hazardous Air Pollutants (NESHAP). The demolition contractor shall be informed that all paint on the buildings shall be considered as containing lead and/or asbestos. The contractor shall follow all work practice standards set forth in the Asbestos National Emission Standards for Hazardous Air Pollutants (Asbestos NESHAP, 40 CFR, Part 61, Subpart M) regulations, as well as Section V, Chapter 3 of the OSHA Technical Manual. All potentially friable asbestos-containing materials shall be removed in accordance with NESHAP guidelines prior to any building demolition or renovation that may disturb the materials. A registered asbestos abatement contractor shall be retained to remove and dispose of asbestos-containing materials identified in the asbestos survey performed for the site in			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
accordance with the standards stated above. The applicant shall submit the work plan to the City for review and approval. The City has the right to defer the work plan to the Santa Clara County Department of Environmental Health for additional review. Materials containing more than one (1) percent asbestos that is friable are also subject to BAAQMD regulations. Removal of materials containing more than one (1) percent friable asbestos shall be completed in accordance with BAAQMD Section 11-2-303.			
Prior to Issuance of a Building Permit			
TRA-1 (XVII-1): The project applicant shall implement the following CAPCOA VMT reduction strategies to reduce the number of vehicle trips that would be generated by future residents, subject to review and approval by the City Engineer. The timing for each strategy is set forth below: ***1) Community-based travel***	Project Applicant	City of Morgan Hill Development Services Department City Engineer	Prior to resident occupancy (#1). Prior to issuance of a building permit (#2).

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
planning (CAPCOA Handbook Strategy T-23) Prior to resident occupancy, the project applicant shall partner with a CBTP service provider such as the Santa Clara Valley Transportation Authority (VTA) or the City of Morgan Hill and ensure that CBTP services are available to project residents. According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.28 percent. ***2) Extend Transit Network Coverage or Hours (CAPCOA Handbook Strategy T-25)***			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
Prior to issuance of a building permit, the project applicant shall pay a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200), which would support the City's current MoGo or future rideshare service for current and future use up to 20 years. The project applicant would be required to fund the construction of a 0.711-mile expansion of a rideshare service through the new completed road with up to two rideshare stops (one located near Watsonville Road, and one near Secretariate Way and Santa Teresa intersection to be reviewed by the City Civil Engineer). The rideshare stop(s) shall be installed and operational prior to certificate of occupancy of the first residence. According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.71 percent.			
During Construction			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
NOI-1 (XIII-1): Noise-generating construction activities associated with the proposed project shall only occur within the hours identified in Municipal Code Section 8.28.040(D). The above language shall be included on final project improvement plans prior to issuance of a grading permit by the City of Morgan Hill Development Services Department.	Project Applicant with Construction Contractor	City of Morgan Hill Development Services Department	Included on final project improvement plans prior to issuance of grading permits, and implemented during construction.
NOI-2 (XIII-2): The following measures shall be implemented during project construction: • All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition; • All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, State, or local agency shall comply with such regulations while in the course of project construction;	Project Applicant with Construction Contractor	City of Morgan Hill Development Services Department	These requirements shall be included via notation on project grading plans, subject to review and approval by the Development Services Department prior to issuance of a grading permit.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
• Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible; • Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors; • Project area and site access road speed limits shall be established and enforced during the construction period; and • Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels. The above requirements shall be included via notation on project grading plans, subject to review and approval by the Development Services Department prior to issuance of a grading permit.			

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
TRA-2 (XVII-2): Prior to issuance of demolition or grading permits, the project applicant shall prepare and submit a Traffic Control Plan to the City for review and approval. The Traffic Control Plan shall include, but not necessarily be limited to, the following items, to the satisfaction of the City Engineer: • Truck drivers shall be notified of and required to use the most direct route between the site and U.S. Route (US) 101, as determined by the City Engineering Department; • All site ingress and egress shall occur only at the main driveways to the project site and construction activities may require installation of temporary (or ultimate) traffic signals as determined by the City Engineer; • Specifically-designated travel routes for large vehicles shall be monitored and controlled by flaggers for large construction vehicle ingress and egress; • Warning signs indicating frequent truck entry and exit shall be posted	Project Applicant with Construction Contractor	City of Morgan Hill Development Services Department City Engineer	Prior to issuance of demolition or grading permits.

Table 1. Mitigation Monitoring and Reporting Program – Summary of Mitigation Measures			
Mitigation Measure	**Implementation Responsibility**	**Monitoring Responsibility[1]**	**Timing of Implementation**
on Watsonville Road and Santa Teresa Boulevard; • Any debris and mud on nearby streets caused by trucks shall be monitored daily and may require instituting a street cleaning program; • Construction employee parking shall be provided on the project site to eliminate conflicts with nearby areas. Construction of the project shall be staggered so that employee parking demand is met primarily by using on-site parking; and • If importation and exportation of material becomes a traffic nuisance, the City Engineer shall limit the hours the activities can take place.			
[1] The City of Morgan Hill may hire a qualified contractor to conduct mitigation monitoring.			

QUAIL VINEYARDS PROJECT

RESPONSES TO PUBLIC COMMENTS AND ERRATA CONCERNING THE INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

This Responses to Comments and Errata document contains responses to comments received during the public review period for the Quail Vineyards Project (proposed project) Initial Study/Mitigated Negative Declaration (IS/MND). The City of Morgan Hill, as lead agency, released the IS/MND for public review beginning on November 4, 2024 and ending on December 4, 2024, pursuant to CEQA Guidelines Section 15105.

According to CEQA Guidelines Sections 15073 and 15074, the lead agency must consider the comments received during consultation and review periods together with the IS/MND. However, unlike with an Environmental Impact Report (EIR), comments received on an IS/MND are not required to be attached to the negative declaration, nor must the lead agency make specific written responses to public agencies. Nonetheless, the lead agency has chosen to provide responses to those specific public comments that are related to the environmental analysis contained in the IS/MND.

COMMENTS AND RESPONSES

The City of Morgan Hill received one comment letter from Liam Downey, President, Quail Meadows Homeowner's Association, during the open comment period on the IS/MND for the proposed project. The following section includes responses to the letter, and where revisions to the IS/MND text are required in response to a comment, new text is double underlined and deleted text is ~~struck through~~.

Comments that are not related to the environmental analysis contained in the IS/MND, but rather are focused on other topics such as project design, will be addressed separately by City staff.

Page 2 – Section A10 – Status of Native American Consultation
In accordance with the California Environmental Quality Act (CEQA), AB52 (Gatto 2014), formal notification and notification of consultation opportunity, pursuant to Public Resources Code § 21080.3.1 (hereafter PRC) was sent to the following:

- Native America Heritage Commission
- Santa Clara Valley Audubon Society
- Mah Mutsun Tribal Band
- Mah Mutsun Tribal Band of Mission San Juan Bautista
- Indian Canyon Mutsum Band of Costanoan
- Muwekma Ohlone Indian Tribe of San Francisco Bay Area
- North Valley YUokuts Tirbe
- The Ohlone Indian Tribe Rumsen Am:Atur:ataj Ohlone
- Tamien Nation
- Tribal Cultural Resources Office

Page 32 – Special Status Wildlife Species

The California Environmental Quality Act (CEQA), Appendix G, does not require consideration of a proposed project's potential impacts to common wildlife species. The question (Question 'a') in Section IV, Biological Resources, of Appendix G, asks:

Would the project:

Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The wildlife species mentioned by the commenter (e.g., coyotes, owls, hawks, egrets, and herons) are not identified by the California Department of Fish and Wildlife (CDFW) or the U.S. Fish and Wildlife Service (USFWS) as candidate, sensitive, or special status. As a result, there is no requirement to analyze these species within the IS/MND. Notwithstanding, certain common bird species are protected by the federal Migratory Bird Treaty Act, as noted on page 35 of the IS/MND. These include the general bird species mentioned by the commenter. Mitigation Measure IV-3 requires a qualified biologist to conduct a preconstruction nesting bird survey should construction occur during the nesting season (February 1 to August 31). If nesting birds are detected on-site, Mitigation Measure IV-3 ensures protection of nesting birds and their young.

Page 99 – Transportation – Pedestrian, Bicycle, and Transit Facilities

Regarding the comment about the intersection of Santa Teresa and Watsonville Road, the City of Morgan Hill Transportation Master Plan (Table 16, Tier 1 Intersection Projects, page 101) states the following regarding this intersection:

- Install signal. Consider 1-lane roundabout with right-turn channelization if ROW can be acquired.

In recognition that the City is considering both a traffic signal and roundabout at the intersection of Santa Teresa and Watsonville Road, the following clarification is made to page 99 of the IS/MND:

> It should also be noted that although not a part of the proposed project, the City of Morgan Hill plans to install a traffic signal or roundabout ~~and eastbound turn lane~~ with right-turn channelization at the intersection of Sunnyside Avenue/Santa Teresa Boulevard and Watsonville Road as outlined in the City's ~~Community-Based Transportation Plan (CBTP) Report~~ Transportation Master Plan.

Regarding the comment about the IS/MND's reference to bike lanes on Santa Teresa Boulevard, the following correction is made to page 100 of the IS/MND:

> In the project vicinity, bike lanes are located along the length of Sunnyside Avenue. While bike lanes are not currently located along ~~and~~ Santa Teresa Boulevard, Class II bike lanes are recommended on it from Watsonville Road to California Avenue in the City's Bikeways, Trails, Parks and Recreation Master Plan. The proposed

project would provide a new six-foot-wide bicycle lane along the project frontage of Watsonville Road. Due to the relatively small size of the proposed project, the project is not expected to generate a significant amount of bicycle trips. Therefore, the demand generated by the proposed project could be accommodated by the existing bicycle facilities in the vicinity of the project site. Thus, the proposed project would not conflict with a program, plan, ordinance, or policy related to the City's bicycle facilities.

Regarding the comment about MoGo, the following revisions have been made to Section XVII, Transportation, Question 'a', of the IS/MND (the bottom paragraph on page 100):

> Furthermore, Mitigation Measure XVII-1 requires implementation of CAPCOA VMT reduction strategies T-23 and T-25. Specifically, the project applicant would be required to extend transit network coverage or hours (CAPCOA Handbook Strategy T-25) for the City's current MoGo or future rideshare service by paying a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200), which would support the City's current MoGo or future rideshare service for current and future use up to 20 years. The City of Morgan Hill calculated the MoGo fees using a rate of two persons per household. Under the existing zoning designations for the site (RE-1 and RPD), each single-family property is allowed at least one dwelling unit; therefore, the City conservatively estimated an average of two dwelling units per lot with an average of four persons per lot or two persons per unit. A MoGo one-way trip costs $2.50 for one rider and MoGo service is provided six days a week. The City assumed that each person would take two round trips MoGo trips per day, six days a week, which totals to $60 a week per person. As such, the City determined that the weekly MoGo cost per lot would be $240 ($60 x 4 persons). The City then multiplied the average cost per lot ($240) by 20 years and determined that the cost associated with adding miles of services and added stop(s) for the proposed development would be $4,800 per unit. Therefore, with 14 residential units, the applicant would be required to pay a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200). Mitigation Measure XVII-1 also requires the applicant to fund the construction of a 0.711-mile expansion of ~~MoGo~~ a rideshare service with up to two rideshare stops within the City of Morgan Hill.

For Question 'b', additional revisions are required for the MoGo discussion on pages 102 through 104 of the IS/MND, as follows:

> The CAPCOA strategies that are applicable to and feasible for the proposed project are described below. CAPCOA VMT reduction strategies T-18 and T-20 are incorporated into the project design, while implementation of CAPCOA VMT reduction strategies T-23 and T-25 would be required through implementation of Mitigation Measures XVII-1.
>
> - **T-18. Provide Pedestrian Network Improvement** – This measure will increase the sidewalk coverage to improve pedestrian access. Providing sidewalks and an enhanced pedestrian network encourages people to walk instead of drive. This mode shift results in a reduction in VMT and GHG emissions; and
> - **T-20. Expand Bikeway Network** – This measure will increase the length of a city or community bikeway network. A bicycle network is an

interconnected system of bike lanes, bike paths, bike routes, and cycle tracks. Providing bicycle infrastructure with markings and signage on appropriately sized roads with vehicle traffic traveling at safe speeds helps to improve biking conditions (e.g., safety and convenience). In addition, expanded bikeway networks can increase access to and from transit hubs, thereby expanding the "catchment area" of the transit stop or station and increasing ridership. This encourages a mode shift from vehicles to bicycles, displacing VMT and thus reducing GHG emissions.

- **T-23. Community-Based Travel Planning** – This measure would target residences in the project area with community-based travel planning (CBTP). CBTP is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT.
- **T-25. Extend Transit Network Coverage or Hours** – This measure would expand the local transit network by either adding or modifying existing transit service or extending the operation hours to enhance the service near the project site. Starting services earlier in the morning and/or extending services to late-night hours can accommodate the commuting times of alternative-shift workers. This encourages the use of transit and therefore reduce VMT and associated GHG emissions.

CAPCOA VMT reduction strategies T-18 and T-20 would be implemented through the proposed project's design. For example, the proposed project would include the construction of sidewalks and bicycle lanes in the project vicinity, which are consistent with CAPCOA VMT reduction strategies T-18 and T-20, respectively, and thus, would result in a reduction in VMT for the proposed project. The CAPCOA Handbook's GHG Reduction Formulas for T-18 and T-20 were relied upon to determine the reduction in VMT for the proposed project. Based on the CAPCOA Handbook's GHG Reduction Formulas, the addition of approximately 0.73 mile of sidewalks and approximately 0.15 mile of bicycle lanes in the project area would result in a 0.62 percent reduction from the home-based VMT per resident associated with the proposed project. With the 0.62 percent reduction, home-based VMT per resident associated with the proposed project would be reduced to 21.9, which is still above the OPR's recommended impact threshold of 20.94 VMT per capita. Therefore, implementation of additional CAPCOA VMT reduction strategies, such as T-23 Provide CBTP and T-25 Extend Transit Network Coverage or Hours would be required to further reduce the project's VMT per capita to a less-than-significant level.

Because implementation of CAPCOA VMT reduction strategies T-23 and T-25 are not already incorporated into the proposed project, implementation of such strategies would be required by Mitigation Measure XVII-1. Consistent with CAPCOA VMT reduction strategy T-23, implementation of Mitigation Measure XVII-1 would require the project applicant to partner with a CBTP service provider such as the Santa Clara VTA or the City of Morgan Hill and ensure that CBTP services are available to project residents, and renewed on an annual basis. In compliance with CAPCOA VMT reduction strategy T-25, Mitigation Measure XVII-1 would also require the project applicant to pay fees, which would support the current City~~'s~~ MoGo or future rideshare service for current and future use up to 20 years. Furthermore, Mitigation Measure XVII-1 would require the applicant to fund

the construction of a 0.711-mile expansion of ~~MoGo~~ a rideshare service through the new completed road with up to two rideshare stops (one located near Watsonville Road, and one near Secretariate Way and Santa Teresa intersection to be reviewed by the City Civil Engineer) ~~within the City of Morgan Hill~~. Based on the CAPCOA Handbook's GHG Reduction Formulas for T-23 and T-25, implementation of CAPCOA VMT reduction strategies T-23 and T-25 would result in a VMT reduction of 2.28 and 2.71 percent, respectively. Therefore, with implementation of Mitigation Measure XVII-1, the home-based VMT per resident associated with the proposed project would be reduced by an additional 4.99 percent.

Based on the above, implementation of CAPCOA reduction strategies T-18, T-20, T-23, and T-25 would result in a total VMT reduction of approximately 5.61 percent and the home-based VMT per resident associated with the proposed project would be reduced from 22.04 to 20.79, which is below the OPR's recommended impact threshold of 20.94 VMT per capita.

Without implementation of Mitigation Measure XVII-1, the proposed project would result in a home-based VMT per resident that would exceed the applicable threshold of 20.94. As a result, the proposed project would conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

XVII-1. *The project applicant shall implement the following CAPCOA VMT reduction strategies to reduce the number of vehicle trips that would be generated by future residents, subject to review and approval by the City Engineer. The timing for each strategy is set forth below:*

1) Community-based travel planning (CAPCOA Handbook Strategy T-23)

Prior to resident occupancy, the project applicant shall partner with a CBTP service provider such as the Santa Clara Valley Transportation Authority (VTA) or the City of Morgan Hill and ensure that CBTP services are available to project residents.

According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.28 percent.

2) Extend Transit Network Coverage or Hours (CAPCOA Handbook Strategy T-25)

Prior to issuance of a building permit, the project applicant shall pay a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200), which would support the City's current MoGo or future rideshare service for current and future use up to 20 years. ~~A total of 0.554 miles of MoGo service is located within~~

> *~~the 0.25-mile buffer surrounding the project site.~~ The project applicant would be required to fund the construction of a 0.711-mile expansion of ~~MoGo~~ a rideshare service through the new completed road with up to two rideshare stops (one located near Watsonville Road, and one near Secretariate Way and Santa Teresa intersection to be reviewed by the City Civil Engineer) ~~within the City of Morgan Hill, the location and design of which shall be determined by the City of Morgan Hill Development Services Department~~. The rideshare stop(s) shall be installed and operational prior to certificate of occupancy of the first residence.*
>
> *According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.71 percent.*

The above revisions to the IS/MND reflect the expectation that MoGo, the City's on-demand rideshare service, will be ending in early 2025. Mitigation Measure XVII-1 has been revised to require the applicant to fund an alternative rideshare service should MoGo cease to operate. Thus, the effectiveness of the mitigation measure remains unchanged.

Page 103 – VMT Impacts and Mitigation Measures

Community-based travel planning (CBTP) has already been conducted for the City of Morgan Hill by the Santa Clara Valley Transportation Authority (VTA) as part of its partnership with the City in preparing the Morgan Hill Community-Based Transportation Plan. Mitigation Measure XVII-1(a) requires that project residents be made aware of existing and future CBTP services and their schedules and fares, such as VTA public transit, including ACCESS Paratransit Service, and Caltrain. The following CBTP projects are fully funded, as identified in the Morgan Hill CBTP: Santa Teresa-Hale Corridor Road and Trail between Dewitt and Main (Phase 1); Main Avenue Bike Lane and Sidewalk Project; Rider's Choice Pilot Program; Mobility Assistance Program (MAP); Regional Means-Based Fare Discount Program; and Morgan Hill Transit Amenities Improvement Project.

City of Morgan Hill
Development Services Department

CITY OF MORGAN HILL

Quail Vineyards Project

Initial Study/Mitigated Negative Declaration

October 2024

Prepared by

RANEY PLANNING & MANAGEMENT, INC. | 25 years
1501 Sports Drive, Suite A, • Sacramento • CA • 95834
Office 916.372.6100 • Fax 916.419.6108

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INITIAL STUDY
SEPTEMBER 2024

A. PROJECT SUMMARY

1. Project Title: Quail Vineyards Project

2. Lead Agency Name and Address: City of Morgan Hill
Development Services Department
Morgan Hill, CA
17575 Peak Avenue
Morgan Hill, CA 95037

3. Contact Person and Phone Number: Tiffany Brown
Senior Planner
(408) 310-4655

4. Project Location: 14905 Santa Teresa Boulevard
Morgan Hill, CA 95037
Assessor's Parcel Number (APN): 779-02-023

5. Project Sponsor's Name and Address: Blackrock, LLC
2730 Lone Oak Court
Gilroy, CA 95020
(408) 892-8345

6. Existing General Plan Designation: Residential Estate (one dwelling unit per acre)

7. Existing Zoning Designation: Residential Estate (RE-1)
Residential Planned Development Overlay District (RPD)

8. Surrounding Land Uses and Setting:

The project site consists of an approximately 18.54-acre parcel located at 14905 Santa Teresa Boulevard in the City of Morgan Hill, California. The project site is identified by Assessor's Parcel Number (APN) 779-02-023. The City of Morgan Hill General Plan land use designation for the site is Residential Estate (one dwelling unit per acre), and the zoning designations for the site are Residential Estate (RE-1) and Residential Planned Development District (RPD). The project site is currently developed with a single-family residence, detached garage, and pool in the southeastern corner of the site, and the Barney Machado Barn is centrally located on-site. The site also contains one active domestic well and water tank within the southeast corner of the site, and one inactive cistern-type well is located within the southern portion of the site near Llagas Creek. In addition, a septic system and associated drain field are located on-site and serve the existing single-family residence. The terminus of Secretariat Way extends into the northwest corner of the site and a segment of Llagas Creek crosses the southern portion of the site and runs north to south. Approximately 12.44 acres of the site are planted with trees, which are associated with former agricultural activities, including Douglas firs in the

northern portion of the site and walnut trees in the southern portion of the site. A total of 24 additional trees, which are not associated with the former agricultural activities, are located in the southeast corner of the site and surround the existing single-family residence, detached garage, pool, and barn.

Surrounding existing land uses include single-family residences to the northeast, across Santa Teresa Boulevard; Llagas Creek, a single-family residence, and oak trees to the southeast; single-family residences to the southwest; and a seasonal fruit stand, agricultural land, and single-family residences to the northwest, across Watsonville Road.

9. Project Description Summary:

The Quail Vineyards Project (proposed project) would include the removal of the existing on-site residence, garage, and pool, as well as the streetlight located within the Secretariat Way terminus; the existing barn and well located north of the existing residence would remain. The water tank would be relocated and the well located south of the existing residence would be decommissioned, consistent with Santa Clara Valley Water District (SCVWD) requirements. The proposed project would include the subdivision of the project site into 14 single-family residential lots, ranging from approximately 43,569 square feet (sf) to 94,254 sf for subsequent development of single-family residences. Each residential lot would include a bio-swale stormwater treatment area. The proposed project would maintain a setback of at least 100 feet from the top of bank of Llagas Creek. Approximately 2.53 acres of the project site would be reserved for private open space easements. As part of the proposed project, the terminus of Secretariat Way, which is located on the project site, would extend further west and intersect with Watsonville Road, north of the project site. Secretariat Way would serve as the central roadway for the project site and primary site access would be provided by Watsonville Road. The proposed residences would be clustered around Secretariat Way and a new cul-de-sac (“Court A”).

The project would require the approval of a Tentative Subdivision Map and Design Permit.

10. Status of Native American Consultation Pursuant to Public Resources Code Section 21080.3.1:

In compliance with Assembly Bill (AB) 52 (Public Resources Code [PRC] Section 21080.3.1), project notification letters were distributed to a consultation list of tribes with traditional lands or cultural places located within the project area, as identified by the Native American Heritage Commission (NAHC), on February 1, 2024. Requests to consult were not received during the 30-day response period.

B. SOURCES

The following documents are referenced information sources used within this analysis:

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18. City of Morgan Hill. *City Council Staff Report 2163, Accept Report Regarding Wastewater System Needs and Rate Study Schedule.* February 6, 2019.
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51. Santa Clara Valley Habitat Agency. *Geobrowser v2.0.* Available at: https://scvha.maps.arcgis.com/apps/webappviewer/index.html?id=f2268679c2fa49489e3f7d6e8377837e. Accessed June 2024.
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C. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Less Than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

☐ **Aesthetics**	☐ **Agriculture and Forest Resources**	☐ **Air Quality**
✖ **Biological Resources**	☐ **Cultural Resources**	☐ **Energy**
✖ **Geology and Soils**	☐ **Greenhouse Gas Emissions**	✖ **Hazards and Hazardous Materials**
☐ **Hydrology and Water Quality**	☐ **Land Use and Planning**	☐ **Mineral Resources**
✖ **Noise**	☐ **Population and Housing**	☐ **Public Services**
☐ **Recreation**	✖ **Transportation**	☐ **Tribal Cultural Resources**
☐ **Utilities and Service Systems**	☐ **Wildfire**	✖ **Mandatory Findings of Significance**

D. DETERMINATION

On the basis of this initial study:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Tiffany Brown, Senior Planner	City of Morgan Hill
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This Initial Study/Mitigated Negative Declaration (IS/MND) identifies and analyzes the potential environmental impacts of the proposed project. The information and analysis presented in this document are organized in accordance with the order of the California Environmental Quality Act (CEQA) checklist in Appendix G of the CEQA Guidelines. Where the analysis provided in this document identifies potentially significant environmental effects of the project, mitigation measures sufficient to reduce the impacts to less-than-significant levels are prescribed. The mitigation measures prescribed for environmental effects described in this IS/MND would be implemented in conjunction with the proposed project, as required by CEQA. The mitigation measures would be incorporated into the proposed project through project conditions of approval. The City would adopt findings and a Mitigation Monitoring/Reporting Program for the proposed project in conjunction with project approval.

In July 2016, the City of Morgan Hill adopted the 2035 General Plan,[1] as well as an associated Environmental Impact Report (EIR) for the updated General Plan.[2] The General Plan EIR is a program EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations [CCR], Sections 15000 *et seq*.). The General Plan EIR analyzed full implementation of the General Plan and identified measures to mitigate the significant adverse impacts associated with the General Plan. Applicable portions of the General Plan and General Plan EIR are incorporated by reference, as necessary, as part of this IS/MND. Project-specific technical reports have been prepared for the proposed project and form the basis of several technical sections of this IS/MND. All technical reports used in the preparation of this IS/MND are included as appendices.

F. PROJECT DESCRIPTION

The following provides a description of the project site's current location and setting, as well as the proposed project components and the discretionary actions required for the project.

Project Location and Setting

The project site, identified by APN 779-02-023, consists of an approximately 18.54-acre parcel located at 14905 Santa Teresa Boulevard in the City of Morgan Hill, California (see Figure 1 and Figure 2). The City's General Plan land use designation for the site is Residential Estate (one dwelling unit per acre), and the City's zoning designations for the site are RE-1 and RPD.

The project site is currently developed with a single-family residence, detached garage, and pool in the southeastern corner of the site, and the Barney Machado Barn is centrally located on-site. The site also contains one active domestic well and water tank within the southeast corner of the site, and one inactive cistern-type well is located within the southern portion of the site near Llagas Creek. In addition, a septic system and associated drain field are located on-site and serve the existing single-family residence. The terminus of Secretariat Way extends into the northwest corner of the site and a segment of Llagas Creek crosses the southern portion of the site and runs north to south. Approximately 12.44 acres of the site is planted with trees, which are associated with former agricultural activities, and include Douglas firs in the northern portion of the site and walnut trees in the southern portion of the site. A total of 24 additional trees, which are not associated with the former agricultural activities, are located in the southeast corner of the site and surround the existing single-family residence, detached garage, pool, and barn. The topography of the site is relatively flat, with elevations ranging from approximately 330 to 345 feet above mean sea level (amsl).

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1 City of Morgan Hill. *2035 General Plan, City of Morgan Hill.* Adopted July 2016.
2 City of Morgan Hill. *Morgan Hill 2035 Final Environmental Impact Report.* Adopted July 2016.

Figure 1
Regional Project Location

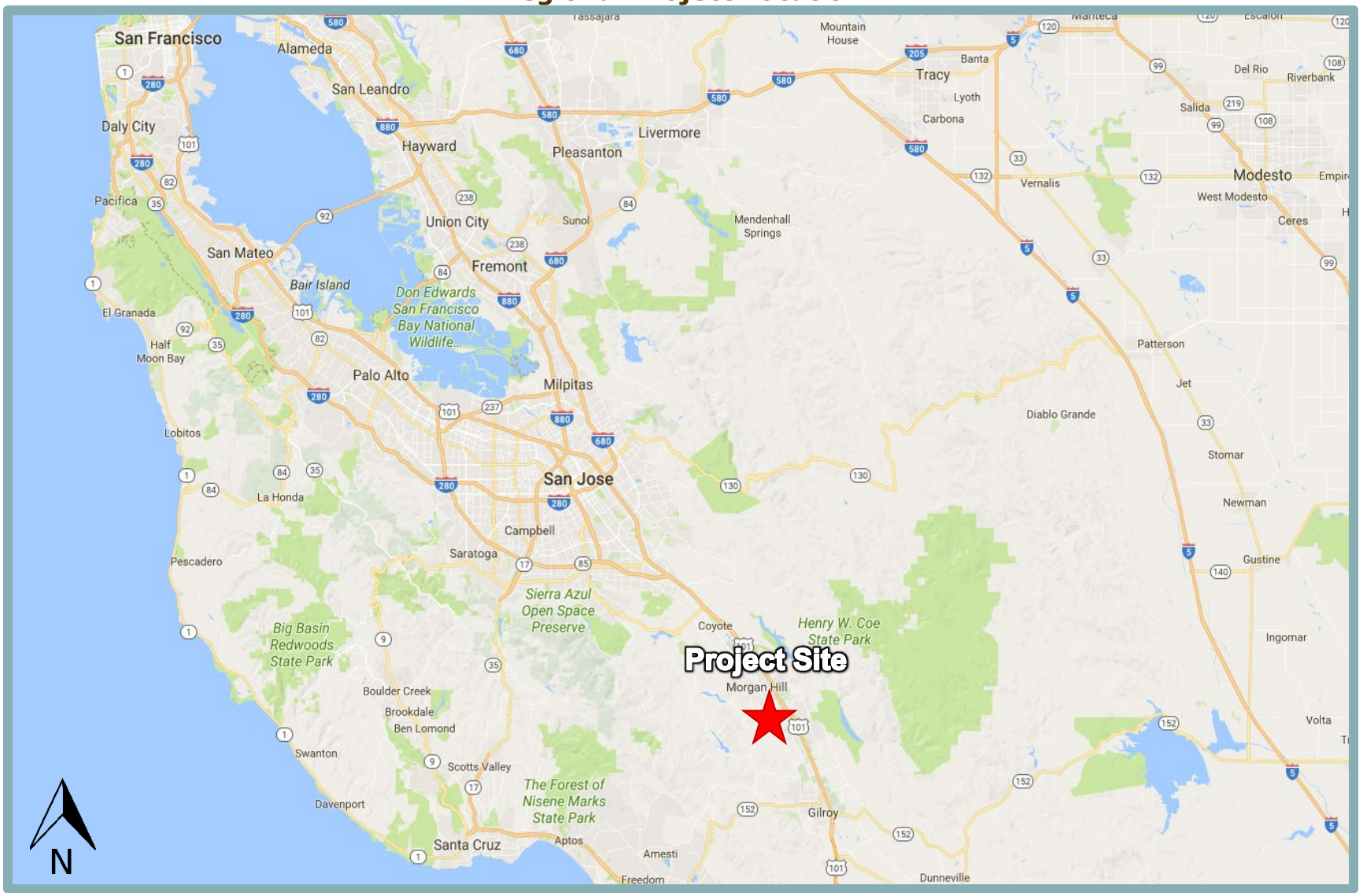


Figure 2
Project Vicinity Map

Surrounding existing land uses include single-family residences to the northeast, across Santa Teresa Boulevard; Llagas Creek, a single-family residence, and oak trees to the southeast; single-family residences to the southwest; and a seasonal fruit stand, agricultural land, and single-family residences to the northwest, across Watsonville Road.

Project Components

The proposed project would include the removal of the existing on-site residence, garage, and pool, as well as the streetlight located within the Secretariat Way terminus; the existing barn and well located north of the existing residence would remain. The water tank would be relocated and the well located south of the existing residence would be decommissioned, consistent with SCVWD requirements.

The proposed project would include the subdivision of the project site into 14 single-family residential lots, ranging from approximately 43,569 sf to 94,254 sf for subsequent development of single-family residences (see Figure 3). Each residential lot would include a bio-swale stormwater treatment area. Approximately 2.53 acres of the southern portion of the project site would be reserved for private open space easements. As part of the proposed project, the terminus of Secretariat Way would extend west and would intersect with Watsonville Road, north of the project site. Secretariat Way would serve as the central roadway for the project site and primary site access would be provided by Watsonville Road. The proposed residences would be clustered around Secretariat Way and a new cul-de-sac ("Court A").

The proposed project would maintain a setback of at least 100 feet from the top of bank of Llagas Creek, as required by Condition 11 of the Santa Clara Valley Habitat Plan (SCVHP). Condition 11 of the SCVHP requires a 100-foot setback for Category 1 streams which are located within the City's Urban Service Area, such as Llagas Creek.

The proposed project would require approval of a Tentative Subdivision Map and Design Permit. The following sections describe the foregoing project components.

Tentative Subdivision Map

The Tentative Subdivision Map would subdivide the project site into 14 single-family residential lots (see Figure 4). The single-family lots would range in size from 43,569 sf to 94,254 sf. The existing on-site Barney Machado Barn would be retained and located on Lot 5.

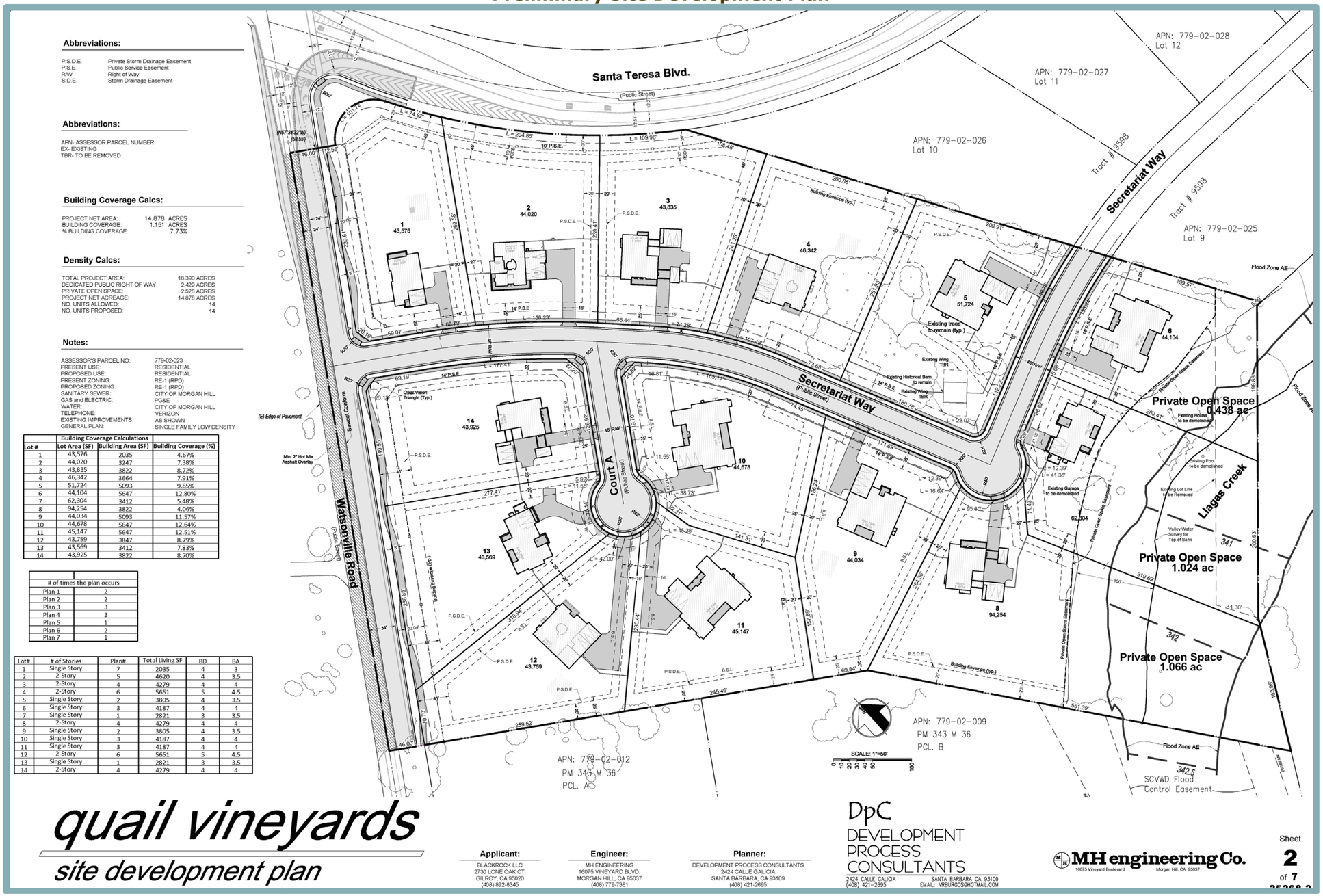
Below is additional detail regarding the site access and circulation, landscaping, utility infrastructure, and off-site improvements.

Site Access and Circulation, and Roadway Improvements

As part of the proposed project, the terminus of Secretariat Way, located east of the project site, would extend west and would intersect with Watsonville Road, north of the project site. Secretariat Way would serve as the central roadway for the project site and primary site access would be provided by Watsonville Road. The proposed residences would be clustered around Secretariat Way and a new cul-de-sac ("Court A").

The extension of Secretariat Way and Court A would be within a 48-foot public right-of-way (ROW) and would provide 18 feet of travel lane, six feet of landscaping, and five-foot-wide sidewalks in each direction (see Figure 5).

Figure 3
Preliminary Site Development Plan



Building Coverage Calculations			
Lot #	Lot Area (SF)	Building Area (SF)	Building Coverage (%)
1	43,576	2035	4.67%
2	44,020	3247	7.38%
3	43,835	3822	8.72%
4	46,342	3664	7.91%
5	51,724	5093	9.85%
6	44,104	5647	12.80%
7	62,304	3412	5.48%
8	94,254	3822	4.06%
9	44,034	5093	11.57%
10	44,678	5647	12.64%
11	45,147	5647	12.51%
12	43,759	3847	8.79%
13	43,569	3412	7.83%
14	43,925	3822	8.70%

# of times the plan occurs	
Plan 1	2
Plan 2	2
Plan 3	3
Plan 4	3
Plan 5	1
Plan 6	2
Plan 7	1

Lot#	# of Stories	Plan#	Total Living SF	BD	BA
1	Single Story	7	2035	4	3
2	2-Story	5	4620	4	3.5
3	2-Story	4	4279	4	4
4	2-Story	6	5651	5	4.5
5	Single Story	2	3805	4	3.5
6	Single Story	3	4187	4	4
7	Single Story	1	2821	3	3.5
8	2-Story	4	4279	4	4
9	Single Story	2	3805	4	3.5
10	Single Story	3	4187	4	4
11	Single Story	3	4187	4	4
12	2-Story	6	5651	5	4.5
13	Single Story	1	2821	3	3.5
14	2-Story	4	4279	4	4

quail vineyards
site development plan

Applicant: BLACKROCK LLC, 2730 LONE OAK CT., GILROY, CA 95020, (408) 892-8345

Engineer: MH ENGINEERING, 16075 VINEYARD BLVD., MORGAN HILL, CA 95037, (408) 779-7381

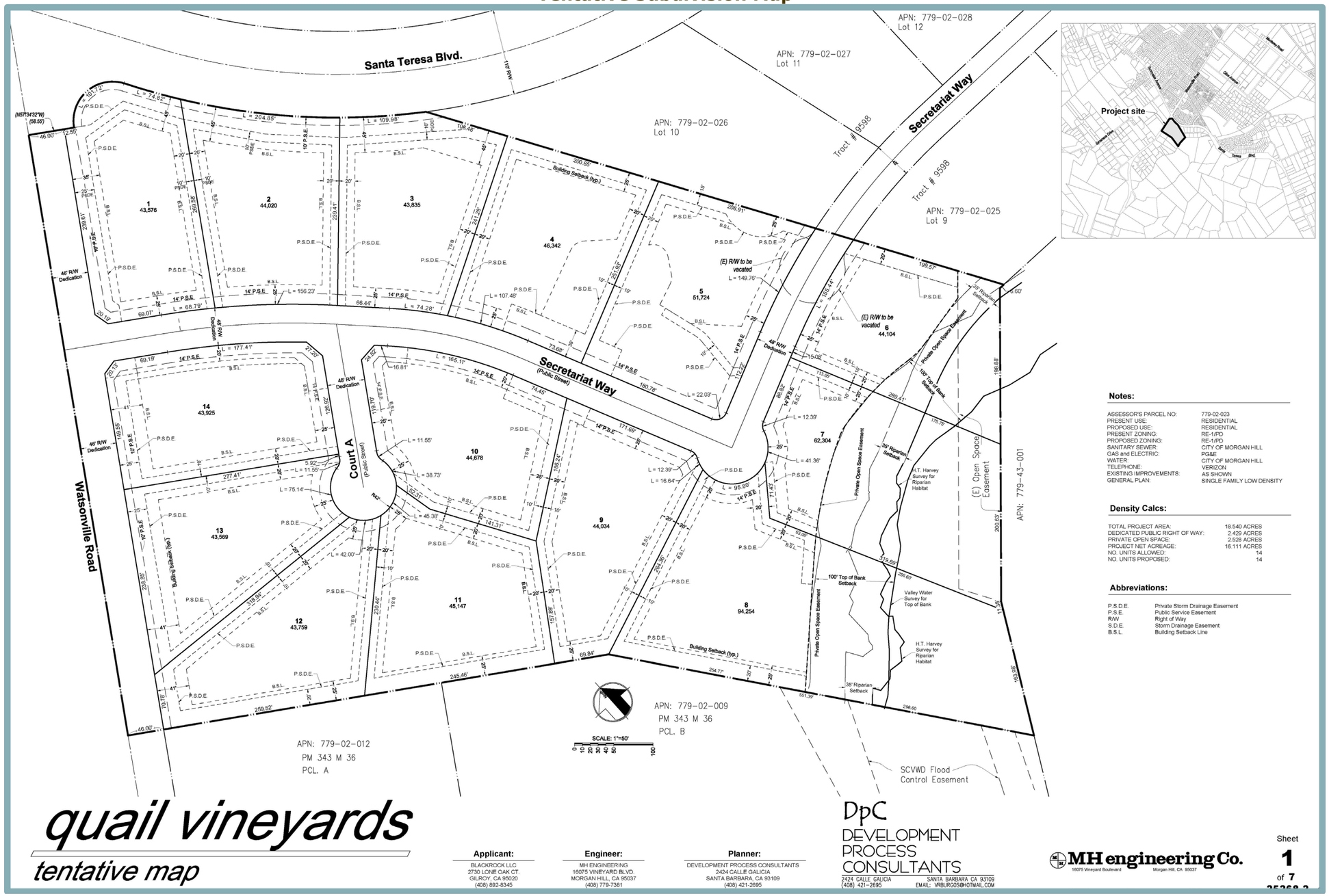
Planner: DEVELOPMENT PROCESS CONSULTANTS, 2424 CALLE GALICIA, SANTA BARBARA, CA 93109, (408) 421-2695

DpC DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA, CA 93109
(408) 421-2695 EMAIL: VRBUROS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

Sheet 2 of 7

Figure 4
Tentative Subdivision Map



Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1/PD
PROPOSED ZONING:	RE-1/PD
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

Density Calcs:

TOTAL PROJECT AREA:	18.540 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	16.111 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement
B.S.L.	Building Setback Line

quail vineyards
tentative map

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

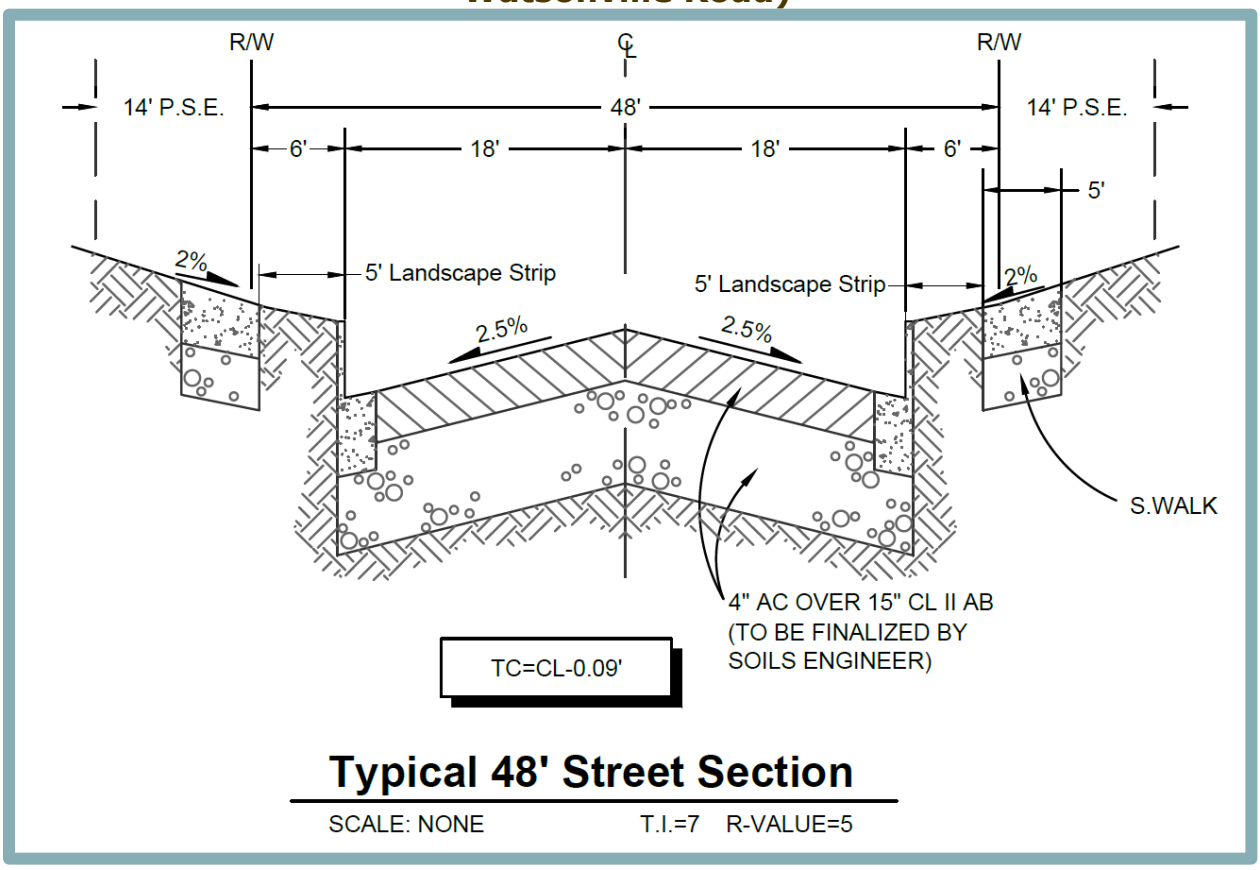
Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

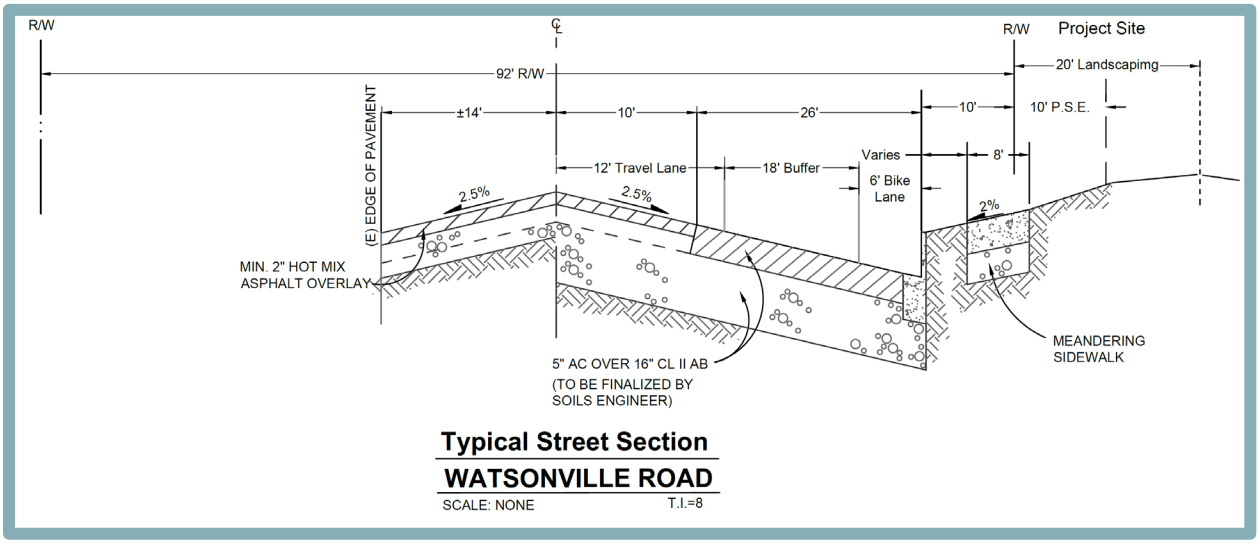
DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA (408) 421-2695
SANTA BARBARA CA 93109 EMAIL: VRBURCOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

Sheet 1 of 7

Figure 5
Roadway Improvements (Internal 48-Foot ROWs and Watsonville Road)





New curbs, gutters, and five to eight-foot-wide sidewalks would be included intermittently along the internal roadways. Each residence would have attached garages capable of housing two to four standard vehicles. Overall, the proposed project would include 40 covered parking spaces (garage spaces).

As part of the proposed project, the 46-foot Watsonville Road public ROW, which is within the project boundaries, would be repaved and reconfigured (see Figure 5). Additional improvements within the Watsonville Road frontage would include a 12-foot-wide travel lane, 18-foot-wide buffer, six-foot-wide bicycle lane, curbs, and continuous eight-foot-wide meandering sidewalks.

Landscaping

The majority of on-site trees would be removed to accommodate the proposed project; however, as shown in Figure 6, an assortment of shrubs and 24-inch box trees, including indigenous Marina madrone and coastal live oaks, and non-indigenous western redbud, hollyleaf cherry, Chinese pistache, and Chinese elm, would be planted along the Watsonville Road frontage, a portion of the Santa Teresa Boulevard frontage, and along all internal roadways. In addition, a variety of drought tolerant shrubs, groundcover, and grasses would be planted throughout the project site. All landscaping would comply with the State's Model Water Efficient Landscape Ordinance (MWELO).

The proposed project would also include construction of a six-foot-high wooden fence along the Watsonville Road frontage, which would serve as a sound barrier. A six-foot-high wooden fence would be located along the eastern, southeastern, and southwestern boundaries of the project site. Furthermore, a stone pilaster with metal fencing would be located along the northern portion of the site adjacent to Santa Teresa Boulevard.

Utilities

Water and sewer service for the proposed development would be provided through connections to existing City infrastructure located in the site vicinity (see Figure 7). The proposed project would include installation of a new eight-inch water line throughout the project site and a new eight-inch water line and a gate valve within Watsonville Road. The water system within the project site would also connect to an existing water main and water lines within Secretariat Way. The proposed project would also include construction of new sanitary sewer lines and sanitary sewer manholes throughout the project site, which would then direct wastewater to the existing sanitary sewer main within Secretariat Way.

A Stormwater Control Plan and Stormwater Report have been prepared for the proposed project (see Figure 8 for the Stormwater Control Plan). In order to manage and treat stormwater, the project site would be divided into 31 drainage management areas (DMAs). DMAs one through 30 would include bio-swales, which would be provided along the side yards and backyards of each lot. The bio-swales would release water into inlets that connect to new storm drain lines and storm drain manholes throughout the new internal roadway system, which would carry water off-site and deliver it into the existing 48-inch storm drain line located within Secretariat Way. The 48-inch storm drain line located within Secretariat Way would connect to an existing 60-inch public storm drain system, which is partially located within Secretariat Way and runs along the eastern boundary of the project site. The 60-inch public storm drain system ultimately drains to Llagas Creek. DMA 31 would be a self-treatment area.

The proposed project would not use natural gas, as natural gas is prohibited in all new construction within Morgan Hill effective March 1, 2020, pursuant to City Ordinance No. 2306.

Figure 6
Preliminary Landscape Plan

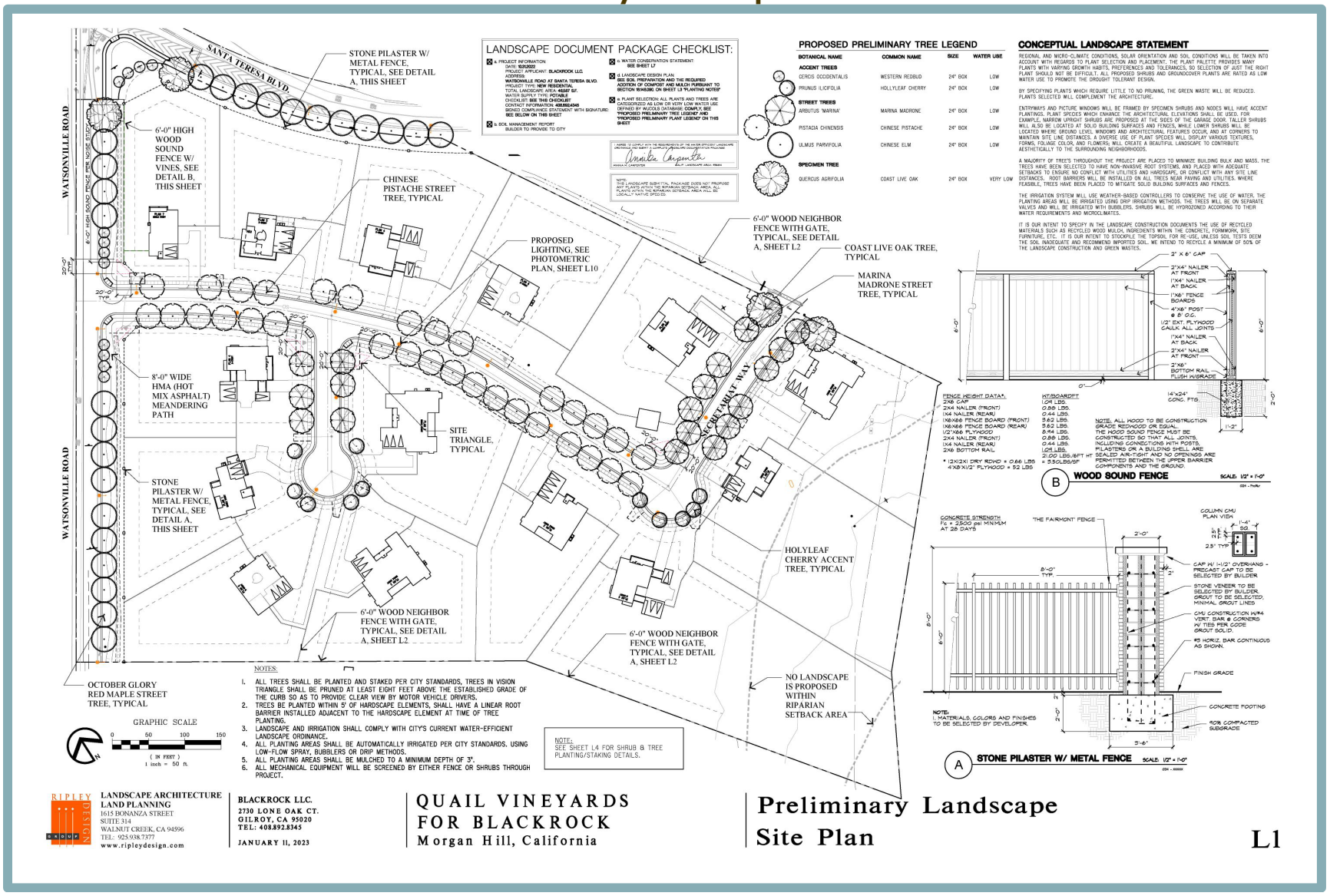
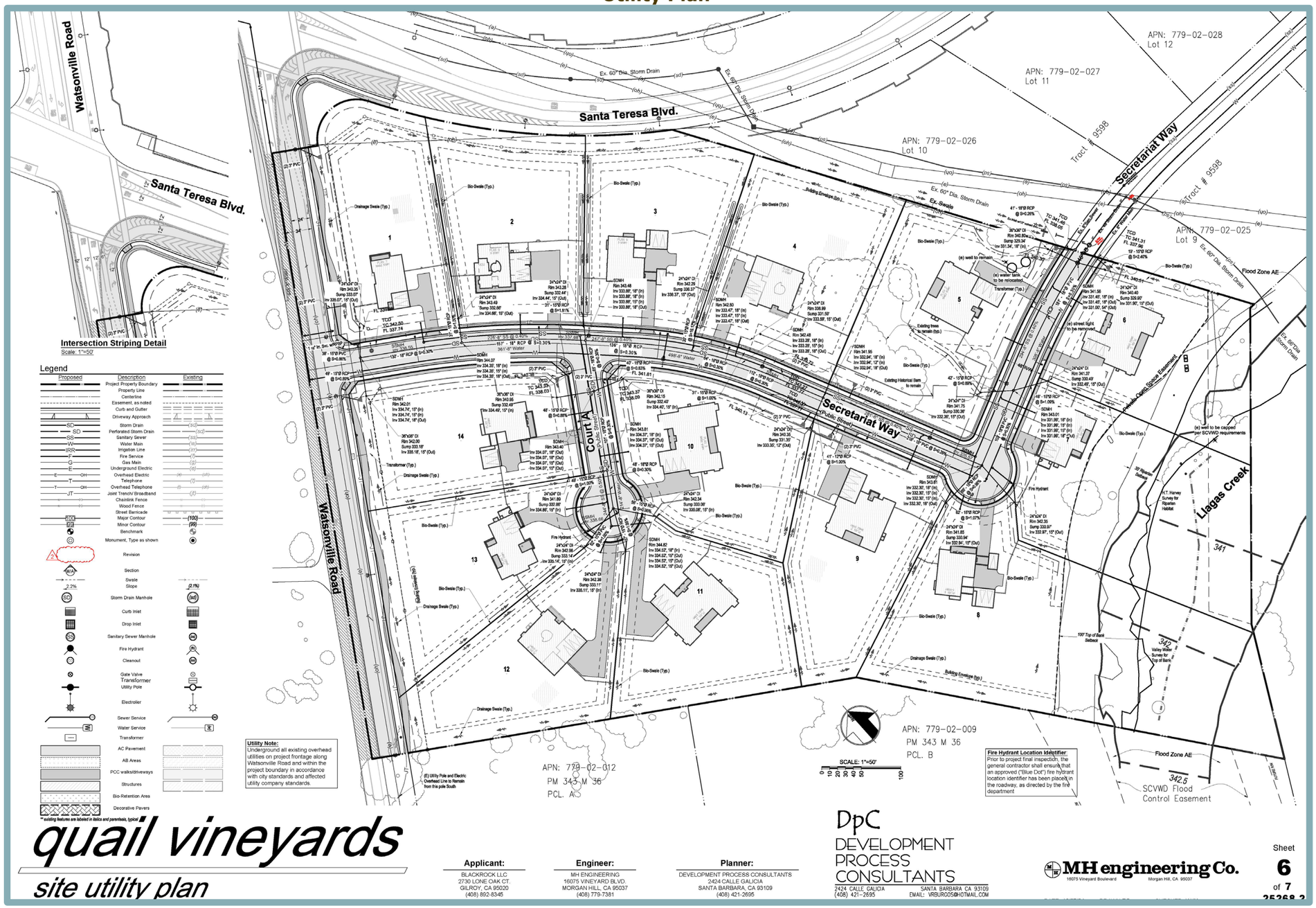


Figure 7
Utility Plan



quail vineyards
site utility plan

Applicant:	Engineer:	Planner:
BLACKROCK LLC 2730 LONE OAK CT. GILROY, CA 95020 (408) 892-8345	MH ENGINEERING 16075 VINEYARD BLVD. MORGAN HILL, CA 95037 (408) 779-7381	DEVELOPMENT PROCESS CONSULTANTS 2424 CALLE GALICIA SANTA BARBARA, CA 93109 (408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

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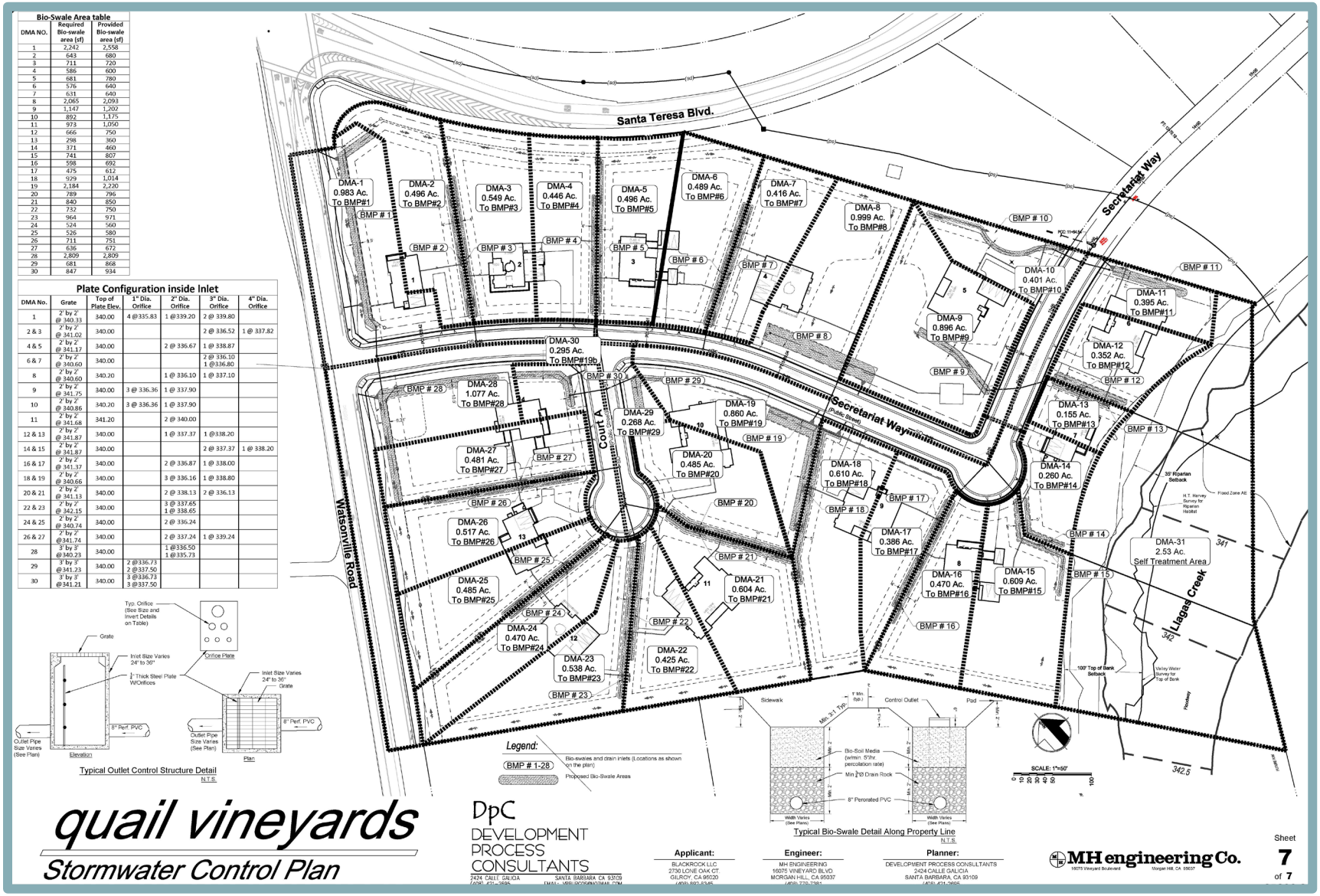
25268.2

Figure 8
Stormwater Control Plan



Bio-Swale Area table

DMA NO.	Required Bio-swale area (sf)	Provided Bio-swale area (sf)
1	2,242	2,558
2	643	680
3	711	720
4	586	600
5	681	780
6	576	640
7	631	640
8	2,065	2,093
9	1,147	1,202
10	892	1,175
11	973	1,050
12	666	750
13	298	360
14	371	460
15	741	807
16	598	692
17	475	612
18	929	1,014
19	2,184	2,220
20	789	796
21	840	850
22	732	750
23	964	971
24	524	560
25	526	580
26	711	751
27	636	672
28	2,809	2,809
29	681	868
30	847	934

Plate Configuration inside Inlet

DMA No.	Grate	Top of Plate Elev.	1" Dia. Orifice	2" Dia. Orifice	3" Dia. Orifice	4" Dia. Orifice
1	2' by 2' @ 340.33	340.00	4 @335.83	1 @339.20	2 @ 339.80	
2 & 3	2' by 2' @ 341.02	340.00			2 @ 336.52	1 @ 337.82
4 & 5	2' by 2' @ 341.17	340.00		2 @ 336.67	1 @ 338.87	
6 & 7	2' by 2' @ 340.60	340.00			2 @ 336.10 1 @336.80	
8	2' by 2' @ 340.60	340.20		1 @ 336.10	1 @ 337.10	
9	2' by 2' @ 341.75	340.00	3 @ 336.36	1 @ 337.90		
10	2' by 2' @ 340.86	340.20	3 @ 336.36	1 @ 337.90		
11	2' by 2' @ 341.68	341.20		2 @ 340.00		
12 & 13	2' by 2' @ 341.87	340.00		1 @ 337.37	1 @338.20	
14 & 15	2' by 2' @ 341.87	340.00			2 @ 337.37	1 @ 338.20
16 & 17	2' by 2' @ 341.37	340.00		2 @ 336.87	1 @ 338.00	
18 & 19	2' by 2' @ 340.66	340.00		3 @ 336.16	1 @ 338.80	
20 & 21	2' by 2' @ 341.13	340.00		2 @ 338.13	2 @ 336.13	
22 & 23	2' by 2' @ 342.15	340.00		3 @ 337.65 1 @ 338.65		
24 & 25	2' by 2' @ 340.74	340.00		2 @ 336.24		
26 & 27	2' by 2' @341.74	340.00		2 @ 337.24	1 @ 339.24	
28	3' by 3' @340.23	340.00		1 @336.50 1 @335.73		
29	3' by 3' @341.23	340.00	2 @336.73 2 @337.50			
30	3' by 3' @341.21	340.00	3 @336.73 3 @337.50			

quail vineyards
Stormwater Control Plan

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA, CA 93109

Applicant:	Engineer:	Planner:
BLACKROCK LLC 2730 LONE OAK CT. GILROY, CA 95020	MH ENGINEERING 16075 VINEYARD BLVD. MORGAN HILL, CA 95037	DEVELOPMENT PROCESS CONSULTANTS 2424 CALLE GALICIA SANTA BARBARA, CA 93109

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

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Off-Site Improvements

The proposed project would include off-site improvements to repave and reconfigure an approximately 14,600-sf segment of Watsonville Road, which is not located within the project boundaries, to include a left-turn lane, northbound lane, and a right-turn slip lane (see Figure 3). In addition, the proposed project would repave and restripe the portion of the Santa Teresa Boulevard/Watsonville Road intersection located north of the proposed project. The proposed project would also include a new eight-foot-wide sidewalk along a 150-linear foot segment of Santa Terea Boulevard, which would connect to the new eight-foot-wide sidewalks along the eastern side of Watsonville Road. Furthermore, the proposed project would also include installation of two eight-foot-wide crosswalks across Watsonville Road and Santa Teresa Boulevard.

Design Permit

The proposed project would require the City's approval of a Design Permit. A Design Permit is a discretionary action that enables the City to ensure that the proposed development exhibits high quality design consistent with the General Plan and any other applicable specific plan or area plan adopted by the City Council. The Design Permit process is also intended to ensure that new development and uses are compatible with their surroundings and minimize negative impacts on neighboring properties.

The 14 subdivided lots would be required to comply with Municipal Code Section 18.16.030 (zoning regulations for RE-1), which include a minimum lot area of one acre, maximum building height of 30 feet, maximum building coverage of 30 percent, a minimum front and rear building setback of 25 feet, minimum interior side building setback of 20 feet, and minimum street side building setback of 15 feet.

Requested/Required Entitlements

The proposed project would require the City's approval of the following entitlements:

- Adoption of the IS/MND and Mitigation Monitoring and Reporting Program (MMRP);
- Tentative Subdivision Map; and
- Design Permit.

G. ENVIRONMENTAL CHECKLIST

The following checklist contains the environmental checklist form presented in Appendix G of the CEQA Guidelines. The checklist form is used to describe the impacts of the proposed project. A discussion follows each environmental issue identified in the checklist. For this checklist, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared.

Less Than Significant with Mitigation Incorporated: An impact that requires mitigation to reduce the impact to a less-than-significant level.

Less-Than-Significant Impact: Any impact that would not be considered significant under CEQA relative to existing standards.

No Impact: The project would not have any impact.

I. AESTHETICS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	✖	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	☐	✖
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	✖	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	✖	☐

Discussion

a,c. The Morgan Hill General Plan does not designate official scenic view corridors or vistas. However, according to the General Plan, the hillsides that surround the City to the east and west are considered scenic. The project site is not located on a hillside and is generally surrounded by existing development. Furthermore, while views of the southwestern hills are visible by motorists, bicyclists, and pedestrians travelling along Santa Teresa Boulevard, the roadways are not considered scenic routes.[3] Additionally, views are partially obscured by existing vegetation and development along the roadways. Thus, the proposed residential development would not substantially degrade existing hillside views.

The project site is located within a relatively urbanized area of the City. In accordance with CEQA checklist question 1.c., the relevant threshold is whether the project would conflict with applicable zoning and other regulations governing scenic quality.

The project site has been previously anticipated for development of single-family residences by the City's General Plan, and impacts related to degradation of visual character and quality were analyzed in the General Plan EIR. As noted previously, the proposed project would be consistent with the General Plan land use designation of Residential Estate and zoning designations of RE-1 and RPD for the project site, which allow for development of up to one detached home per acre. As such, changes to the visual character and quality of the site have been evaluated by the City. In addition, as discussed above, the proposed project would include landscaping elements which would

[3] It is important to distinguish between public and private views. Private views are views seen from privately-owned land and are typically viewed by individual viewers, including views from private residences. Public views are experienced by the collective public. These include views of significant landscape features and along scenic roads. California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.) case law has established that only public views, not private views, are protected under CEQA. For example, in *Association for Protection etc. Values v. City of Ukiah* (1991) 2 Cal.App.4th 720 [3 Cal. Rptr.2d 488] the court determined that "we must differentiate between adverse impacts upon particular persons and adverse impacts upon the environment of persons in general. As recognized by the court in *Topanga Beach Renters Assn. v. Department of General Services* (1976) 58 Cal.App.3d 188 [129 Cal.Rptr. 739]: '[A]ll government activity has some direct or indirect adverse effect on some persons. The issue is not whether [the project] will adversely affect particular persons but whether [the project] will adversely affect the environment of persons in general.'" Therefore, it is appropriate to focus the aesthetic impact analysis on potential impacts to public views.

partially screen public views of the site and would be visually compatible with the surrounding development. Furthermore, the proposed project is subject to a Design Permit in accordance with Morgan Hill Municipal Code Section 18.108.040, which requires that the proposed project be consistent with the City's Architectural Review Handbook findings. All new buildings, exterior renovations, and site alterations are subject to the standards and guidelines of the Architectural Review Handbook, which are applied by the City through the Design Permit process.

Based on the above, the General Plan does not designate any official scenic vistas within the City of Morgan Hill, and the project site is in an urbanized area. In addition, the Design Review process would ensure that all project elements are consistent with the City's Architectural Review Handbook. Thus, the proposed project would not have a substantial adverse effect on a scenic vista or conflict with applicable zoning and other regulations governing scenic quality, and a ***less-than-significant*** impact would occur.

b. According to the California Department of Transportation (Caltrans) map of Santa Clara County prepared for the Scenic Highway Mapping System, the nearest officially designated State Scenic Highway to the project site is a segment of State Route (SR) 9, approximately 21.1 miles to the northwest of the project site.[4] Therefore, officially designated State or County scenic highways do not occur in the project vicinity. Because the project site is not located in the vicinity of any State scenic highway, the proposed project would not damage any scenic resources within a State Scenic Highway. Therefore, ***no impact*** related to damaging scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway would occur.

d. The only existing source of light on the project site is the existing on-site single-family residence. Relatively minimal sources of light and glare exist within the project vicinity, such as single-family residences to the northeast, northwest, southeast, and southwest, and vehicles traveling along Santa Teresa Boulevard and Watsonville Road. Therefore, redevelopment of the project site with 14 residences would add new sources of light and glare to the site, where minimal sources currently exist. The proposed project is anticipated to include streetlights along internal roadways and the project frontage, as well as interior lights, which could spill from the windows of the proposed residences. In addition, the proposed project would generate vehicle trips which, in turn, would create sources of light from vehicle headlights. Light and glare associated with the proposed project would be expected to be similar to that of the surrounding area.

New sources of lighting would be required to comply with the standards set forth in the City's Architectural Review Handbook for single-family residences, as well as Sections 15.40.310 and 15.40.420 of the Morgan Hill Municipal Code. For example, all lighting, including security lighting, shall be shielded to minimize glare upon neighboring property and public ROWs. Compliance with such would help to ensure that the light and glare created by the proposed project would be consistent with the levels of light and glare currently emitted in the surrounding developed environment. Therefore, the proposed project would not introduce new sources of substantial light or glare to the site which would adversely affect day or nighttime views in the area, and a ***less-than-significant*** impact would occur.

---

[4] California Department of Transportation (Caltrans). *California State Scenic Highway System Map.* Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed June 2024.

II. AGRICULTURE AND FOREST RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	✖	☐
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	✖
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	✖
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	✖
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	✖	☐

Discussion

a,e. According to the California Department of Conservation Farmland Mapping and Monitoring Program, the project site is designated as "Farmland of Local Importance" and "Urban and Built-Up Land."[5] The project site does not contain, and is not located adjacent to, Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. While the project site was previously used as an orchard, the project site is not currently used for agricultural purposes, does not support forest land, and the site is surrounded by land designated Urban and Built-Up Land, Farmland of Local Importance, and Other Land. Overall, development of the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use or result in the loss of forest land to non-forest use. Thus, a ***less-than-significant*** impact would occur as a result of the proposed project.

b. The project site is currently zoned RE-1 and RPD; thus, the site is not zoned for agricultural use. Additionally, the project site is not under a Williamson Act contract.[6] Therefore, buildout of the proposed project would not conflict with zoning for an agricultural use or a Williamson Act contract, and ***no impact*** would occur.

c,d. The project site is not considered forest land (as defined in PRC Section 12220[g]), timberland (as defined by PRC Section 4526), and is not zoned Timberland Production (as defined by Government Code Section 51104[g]). Therefore, the proposed project would have ***no impact*** with regard to conversion of forest land or any potential conflict with forest land, timberland, or Timberland Production zoning.

[5] California Department of Conservation. *California Important Farmland Finder.* Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed June 2024.

[6] City of Morgan Hill. *Morgan Hill 2035 Draft Environmental Impact Report* [pg. 4.2-4, Figure 4.2-2]. January 2016.

III. AIR QUALITY. *Would the project:*		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	✖	☐
b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	✖	☐
c.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	✖	☐
d.	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	✖	☐

Discussion

a,b. The City of Morgan Hill is located in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The SFBAAB area is currently designated as a nonattainment area for State and federal ozone, State and federal fine particulate matter 2.5 microns in diameter ($PM_{2.5}$), and State respirable particulate matter 10 microns in diameter (PM_{10}) ambient air quality standards (AAQS). The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the U.S. Environmental Protection Agency (USEPA) issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ federal AAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the federal $PM_{2.5}$ AAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation. The USEPA has not yet approved a request for redesignation of the SFBAAB; therefore, the SFBAAB remains in nonattainment for 24-hour $PM_{2.5}$.

In compliance with regulations, due to the nonattainment designations of the area, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which was adopted on October 24, 2001 and approved by the California Air Resources Board (CARB) on November 1, 2001. The plan was submitted to the USEPA on November 30, 2001 for review and approval. The most recent State ozone plan is the 2017 Clean Air Plan, adopted on April 19, 2017. The 2017 Clean Air Plan was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, toxic air contaminants (TACs), and greenhouse gases (GHGs). Although a plan for achieving the State PM_{10} standard is not required, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2017 Clean Air Plan. The control strategy serves as the backbone of the BAAQMD's current PM control program.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures to be implemented in the region to attain the State and federal AAQS within the SFBAAB. Adopted BAAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure

continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with applicable air quality plans. For development projects, BAAQMD establishes significance thresholds for emissions of the ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_X), as well as for PM_{10}, and $PM_{2.5}$, expressed in pounds per day (lbs/day) and tons per year (tons/yr). The thresholds are listed in Table 1. Thus, by exceeding the BAAQMD's mass emission thresholds for construction and operational emissions of ROG, NO_X, or PM_{10}, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts.

Table 1
BAAQMD Thresholds of Significance

Pollutant	Construction	Operational	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	54	10
NOx	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10

Source: BAAQMD, CEQA Guidelines, April 2023.

Particulate matter can be split into two categories: fugitive and exhaust. The BAAQMD thresholds of significance for exhaust are presented in Table 1. BAAQMD does not maintain quantitative thresholds for fugitive emissions of PM_{10} or $PM_{2.5}$, rather, BAAQMD requires all projects within the district's jurisdiction to implement Basic Construction Mitigation Measures (BCMMs) related to dust suppression.

The proposed project's construction and operational emissions were quantified using the California Emissions Estimator Model (CalEEMod) software version 2022.1.1.24 – a Statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including construction data, vehicle mix, trip length, average speed, compliance with the 2022 California Building Standards Code (CBSC), etc. Where project-specific information is available, such information should be applied in the model. Accordingly, the proposed project's modeling assumes the following project and/or site-specific information:

- Construction would begin in August 2024[7] and occur over approximately nine months;
- Grading would involve the export of 4,241 cubic yards and import of 42,974 cubic yards of soil;
- The proposed residential units would not include fireplaces;
- The project site is located within 1.5-mile of the nearest transit stop;
- The project would include a 10 percent indoor and 20 percent outdoor water conservation strategy;

[7] It is noted that when the air quality analysis was conducted, project construction was anticipated to commence in August 2024. While this is no longer the case, the analysis conducted for this Initial Study is conservative because construction fleets and electricity generation are becoming more efficient over time due to state regulations; thus, modeling construction at an earlier start date provides a more conservative analysis.

- The project would comply with the MWELO and the 2022 CALGreen Code; and
- The project would comply with all applicable provisions of the 2022 California CBSC.

The proposed project's estimated emissions associated with construction and operations and the project's contribution to cumulative air quality conditions are provided below. All CalEEMod results are included as Appendix A to this IS/MND.

Construction Emissions

During construction of the proposed project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction worker commutes, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes PM emissions. As construction of the proposed project would generate air pollutant emissions intermittently within the site and vicinity, until all construction has been completed, construction is a potential concern because the project is in a non-attainment area for ozone, PM_{10}, and $PM_{2.5}$.

According to the CalEEMod modeling results, buildout of the proposed project would result in maximum unmitigated construction criteria air pollutant emissions as shown in Table 2. As shown in the table, the proposed project's construction emissions would be below the applicable thresholds of significance for ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Table 2
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	2.12	54	**NO**
NO_X	13.8	54	**NO**
PM_{10}*	0.54	82	**NO**
$PM_{2.5}$*	0.49	54	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD has not yet adopted PM thresholds for fugitive emissions.

Source: CalEEMod, June 2024 (see Appendix A).

All projects within the jurisdiction of the BAAQMD are required to implement all of the BAAQMD's BCMMs, which would be required by the City as conditions of approval:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
8. Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a six- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

The proposed project's required implementation of the BAAQMD's BCMMs listed above for the project's construction activities would help to further minimize construction-related emissions.

Overall, because the proposed project would be below the applicable thresholds of significance for construction emissions, project construction would not result in a significant air quality impact.

Operational Emissions

Operational emissions of ROG, NO_X, and PM would be generated by the proposed project from both mobile and stationary sources. Day-to-day activities, such as the future vehicle trips to and from the project site, would make up the majority of the mobile emissions. Emissions would also occur from area sources, such as operations from landscape maintenance equipment exhaust.

According to the CalEEMod results, buildout of the proposed project would result in maximum unmitigated operational criteria air pollutant emissions as shown in Table 3.

Table 3
Maximum Unmitigated Operational Emissions

Pollutant	Proposed Project Emissions		Threshold of Significance		Exceeds Threshold?
	lbs/day	tons/yr	lbs/day	tons/yr	
ROG	1.96	0.36	54	10	**NO**
NO_X	0.61	0.11	54	10	**NO**
PM_{10}*	0.02	<0.005	82	15	**NO**
$PM_{2.5}$*	0.02	<0.005	54	10	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD has not yet adopted PM thresholds for fugitive emissions.

Source: CalEEMod, June 2024 (see Appendix A).

As shown in the table, operations of the proposed project would be below the applicable thresholds of significance. Thus, operations of the project would not be considered to conflict with air quality plans during project operations.

Cumulative Emissions

Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By nature, air pollution is largely a cumulative impact. A single project is not sufficient in size to, by itself, result in nonattainment of AAQS. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. The thresholds of significance presented in Table 1 represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If a project exceeds the significance thresholds presented in Table 1, the proposed project's emissions would be cumulatively considerable, resulting in significant adverse cumulative air quality impacts to the region's existing air quality conditions.

Because the proposed project would result in both construction-related and operational emissions below the applicable thresholds of significance, construction and operations of the project would not be expected to result in a cumulatively considerable contribution to the region's existing air quality conditions.

Conclusion

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2017 Clean Air Plan. According to BAAQMD, if a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project may be considered consistent with the air quality plans.

As discussed above, the proposed project would result in construction and operational emissions below the applicable thresholds of significance. Therefore, the proposed project would not conflict with or obstruct implementation of the applicable air quality plans, violate any air quality standards or contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in any criteria air pollutant, and impacts would be considered ***less than significant***.

c. Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution.

Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. Existing sensitive receptors near the project site include the single-family residences to the north, east, west, and south of the project site boundary. The nearest residence is located approximately 30 feet southwest of the site boundary. The closest receptor to where the off-site infrastructure improvements would

occur along Santa Teresa Boulevard is located approximately 80 feet to the east of the off-site improvement areas. The closest receptor to where the off-site improvements would occur along Watsonville Road is located approximately 250 feet southeast of the off-site improvement areas.

The major pollutant concentrations of concern are localized carbon monoxide (CO) emissions and TACs, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. High levels of localized CO concentrations are only expected where background levels are high, and traffic volumes and congestion levels are high. Emissions of CO are of potential concern, as the pollutant is a toxic gas that results from the incomplete combustion of carbon-containing fuels such as gasoline or wood. CO emissions are particularly related to traffic levels.

In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a proposed project would result in a less-than-significant impact related to localized CO emission concentrations if all of the following conditions are true for the project:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The City's General Plan serves to provide traffic forecasts to the Santa Clara Valley Transportation Authority (VTA). Given that the proposed project is consistent with the site's current land use and zoning designations, the proposed project would not conflict with the Santa Clara VTA Congestion Management Program (CMP).[8] Based on the trip generation from the CalEEMod modeling results, which relied upon the Institute of Transportation Engineer's Trip Generation Handbook 10th Edition, the proposed project would generate approximately 133 new daily trips (14 dwelling units X 9.44 weekday trips per unit). Considering the proposed project is expected to generate up to 133 new daily trips, traffic associated with the proposed development would not increase traffic volumes at any affected intersection to more than 44,000 vehicles per hour. Furthermore, areas where vertical and/or horizontal mixing is limited due to tunnels, underpasses, or similar features do not exist in the project area. Therefore, based on the BAAQMD's screening criteria for localized CO emissions, the proposed project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards or cause health hazards.

[8] Santa Clara Valley Transportation Authority. *2021 Congestion Management Program Document.* December 2021.

TAC Emissions

Another category of environmental concern is TACs. The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook) provides recommended setback distances for sensitive land uses from major sources of TACs, including, but not limited to, freeways and high traffic roads, distribution centers, gas dispensing facilities, and rail yards. The CARB has identified diesel particulate matter (DPM) from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. Health risks associated with TACs are a function of both the concentration of emissions and the duration of exposure, where the higher the concentration and/or the longer the period of time that a sensitive receptor is exposed to pollutant concentrations would correlate to a higher health risk. As noted above, the existing sensitive receptors near the project site include the single-family residences to the north, east, west, and south of the project site boundary.

The proposed project does not include any operations that would be considered a substantial source of TACs. Accordingly, operations of the proposed project would not expose sensitive receptors to excess concentrations of TACs.

Short-term, construction-related activities would result in the generation of TACs, specifically DPM, from on-road haul trucks and off-road equipment exhaust emissions. Construction is temporary and occurs over a relatively short duration in comparison to the operational lifetime of the proposed project. Health risks are typically associated with exposure to high concentrations of TACs over extended periods of time (e.g., 30 years or greater), whereas the construction period associated with the proposed project is estimated to be approximately two years.

All construction equipment and operation thereof would be regulated per the In-Use Off-Road Diesel Vehicle Regulation, which is intended to help reduce emissions associated with off-road diesel vehicles and equipment, including DPM. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. In addition, only portions of the site would be disturbed at a time throughout the construction period, with operation of construction equipment occurring intermittently throughout the course of a day rather than continuously at any one location on the project site. Operation of construction equipment within portions of the development area would allow for the dispersal of emissions, and would ensure that construction-activity is not continuously occurring in the portions of the project site closest to existing receptors. Because construction equipment on-site would not operate for long periods of time and would be used at varying locations within the site, associated emissions of DPM would not occur at the same location (or be evenly spread throughout the entire project site) for long periods of time. Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low.

Furthermore, the project applicant would be required to prepare, and include on all site development and grading plans, a management plan detailing strategies for control of noise, dust and vibration, and storage of hazardous materials during construction of the project. Pursuant to Section 18.76.040 (Air Contaminants) of the City's Municipal Code, the management plan must include all applicable BAAQMD rules and regulations, as well as the City's standard conditions for construction activity. The City of Morgan Hill

Development Services Department would ensure that the BAAQMD's BCMMs, listed under section "a,b" above, would be noted on project construction drawings prior to issuance of a building permit or approval of improvement plans.

Conclusion

Based on the above, the proposed project would not expose any sensitive receptors to substantial concentrations of localized CO or TACs associated with construction or operation. Therefore, the proposed project would not result in the exposure of sensitive receptors to substantial pollutant concentrations, and a ***less-than-significant*** impact would occur.

d. Emissions such as those leading to odors have the potential to adversely affect sensitive receptors within the project area. Pollutants of principal concern include emissions leading to odors, emission of dust, or emissions considered to constitute air pollutants. Air pollutants have been discussed in sections 'a' through 'c' above. Therefore, the following discussion focuses on emissions of odors and dust.

Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The presence of an odor impact is dependent on several variables including: the nature of the odor source; the frequency of odor generation; the intensity of odor; the distance of odor source to sensitive receptors; wind direction; and sensitivity of the receptor.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, quantification of significant odor impacts is relatively difficult. Typical odor-generating land uses include, but are not limited to, wastewater treatment plants, landfills, and composting facilities. The proposed project would not introduce any such land uses.

Construction activities often include diesel-fueled equipment and heavy-duty diesel trucks, which can create odors associated with diesel fumes, which could be found to be objectionable. However, as discussed above, construction activities would be temporary, and operation of construction equipment would be regulated and intermittent. Project construction would also be required to comply with all applicable BAAQMD rules and regulations, particularly associated with permitting of air pollutant sources. The aforementioned regulations would help to minimize air pollutant emissions, as well as any associated odors. Accordingly, substantial objectionable odors would not occur during construction activities or affect a substantial number of people.

In addition, the BAAQMD rules and regulations would act to reduce construction related dust, which would ensure that construction of the proposed project does not result in substantial emissions of dust. Following project construction, the project site would not include any exposed topsoil. Thus, project operations would not include any substantial sources of dust.

For the aforementioned reasons, construction and operation of the proposed project would not result in emissions (such as those leading to odors) adversely affecting a substantial number of people, and a ***less-than-significant*** impact would occur.

IV. BIOLOGICAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	✖	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	✖	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	✖	☐
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	✖	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	✖	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	✖	☐	☐

Discussion

The following discussion is based primarily on the Updated Biological Resources Report prepared by H.T. Harvey & Associates, for the proposed project (see Appendix B).[9]

a. Several species of plants and animals within the State of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the State's human population grows and the habitats the species occupy are converted to agricultural and urban uses. State and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the State. A sizable number of native plants and animals have been formally designated as threatened or endangered under State and federal endangered species legislation. Others have been designated as "candidates" for such listing. Still others have been designated as "fully protected" or "species of special concern" by CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered. Collectively, these plants and animals are referred to as "special-status species." Although CDFW Species of Special Concern generally do not have special legal status, they are given special consideration under CEQA. Special-status species include the following:

[9] H.T. Harvey & Associates. *Quail Vineyards Project, Updated Biological Resources Report.* September 21, 2023.

- Plant and wildlife species that have been formally listed as threatened or endangered, or are candidates for such listing by the CDFW or National Marine Fisheries Service (NMFS);
- Plant and wildlife species that have been listed as threatened or endangered or are candidates for such listing by the CDFW;
- CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue;
- CDFW Fully Protected Species; and
- Species on CNPS Lists 1 and 2, which are considered to be rare, threatened, or endangered in California by the CNPS and CDFW.

In addition to regulations for special-status species, most birds in the U.S., including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, destroying active nests, eggs, and young is illegal. In addition, plant species on CNPS Lists 1 and 2 are considered special-status plant species and are protected under CEQA.

The project site is located within the boundaries of the SCVHP, which provides take authorization for 18 listed and non-listed species (i.e., covered species). In addition, the SCVHP includes conservation measures to protect the species covered by the SCVHP, as well as a conservation strategy designed to mitigate impacts on covered species and contribute to the recovery of the species in the study area. Compliance with the SCVHP is discussed under question 'f' below.

As part of the Updated Biological Resources Report, a literature review was conducted to evaluate the potential for special-status species to occur within the project area. In addition to a literature review, the CDFW California Natural Diversity Database (CNDDB) and the CNPS Inventory of Rare, Threatened, and Endangered Plants of California were queried for occurrences of special-status species in the vicinity of the site.

Furthermore, reconnaissance-level surveys of the project site were conducted on June 7 and 12, 2012, and additional surveys were conducted to observe updated site conditions on December 16, 2017, and September 7, 2023. The purpose of the reconnaissance surveys was to provide a project-specific impact assessment for development of the proposed project. Specifically, surveys were conducted to: 1) assess existing biotic habitats and plant and animal communities on the project site; 2) assess the project site for its potential to support special-status species and their habitats; and 3) identify potential jurisdictional habitats such as waters of the U.S. and riparian habitat. On September 30, 2022, H.T. Harvey & Associates visited the site to map the outer edge of riparian canopy and top of bank along Llagas Creek. On March 30, 2023, H.T. Harvey & Associates visited the site with representatives of the SCVWD and MH Engineering to refine the mapping for the top of the Llagas Creek bank. In addition, as required by SCVHCP Condition 17, a habitat survey for tricolored blackbird must be conducted for projects located within 250 feet of any riparian woodland land cover. Therefore, in compliance with SCVHP Condition 17, H. T. Harvey & Associates conducted a field investigation on September 7, 2023, to identify and map potential nesting substrate for tricolored blackbirds.

Topography within the project site is relatively flat, with elevations ranging from approximately 330 to 345 feet amsl. Currently, the project site is developed with a single-family residence, detached garage, and pool in the southeastern corner of the site, and

the Barney Machado Barn, which is centrally located on-site. The site also contains one active domestic well and water tank within the southeast corner of the site, and one inactive cistern-type well is located within the southern portion of the site near Llagas Creek. The terminus of Secretariat Way extends into the northwest corner of the site and a segment of Llagas Creek crosses the southern portion of the site and runs north to south. Approximately 12.44 acres of the site is planted with trees, which are associated with former agricultural activities. A total of 24 additional trees, which are not associated with the former agricultural activities, are located in the southeast corner of the site. According to the Updated Biological Resources Report, the National Wetlands Inventory depicts one wetland feature within the project site, Llagas Creek, which is Palustrine, forested, and seasonally flooded. It should be noted that the off-site improvement areas within Watsonville Boulevard and Santa Teresa Boulevard are paved roadways. As such, impacts to biological resources within the off-site improvement areas are not anticipated. Based on the results of the database review and field survey conducted as part of the Updated Biological Resources Report, the potential for special-status species to occur on the project site is discussed in further detail below.

Special-Status Plant Species

According to the CNDDB search conducted by H.T. Harvey & Associates as part of the Updated Biological Resources Report, a total of 76 special-status plant species have been documented within the project region. Of the 76 special-status plant species identified in the Updated Biological Resource Report, 59 species were determined to be absent from the project site due to one or more of the following reasons: 1) lack of specific soil properties such as serpentine soils, alkaline soils, and rock outcrops; 2) lack of suitable habitat types such as vernal pools, marshes and swamps, chaparral, coastal prairie, and coastal salt marsh; 3) the elevation range of the species is outside the range of the project site; or 4) the degraded habitat conditions on the project site are not likely to support the species in question.

The remaining 17 plant species were further analyzed by H.T. Harvey & Associates for their potential to occur on the project site. Two of the special-status plant species, arcuate bush mallow (*Malacothamnus arcuatus*) and woodland woolythreads (*Monolopia gracilens*), are known to occur in the site vicinity. According to the Updated Biological Resource Report, the arcuate bush mallow has been recorded within three miles northwest of the project site and is an evergreen shrub. Therefore, if the species occurred at the project site, the species would have been detectable during field surveys in June. Furthermore, on-site habitat has been degraded due to cultivation and would not support the arcuate bush mallow. In addition, recent records of the woodland woolythreads are not available and the on-site habitat is too degraded to support the species. Thus, H.T. Harvey & Associates determined that the arcuate bush mallow, woodland woolythreads, and the remaining special-status plant species were absent from the project site. Furthermore, the project site is not located within a SCVHP-mapped plant survey area. Thus, the proposed project would not result in adverse effects to special-status plant species.

Special-Status Wildlife Species

Several of the special-status species identified by the CNDDB are not expected to occur on the project site because 1) the site lacks suitable habitat, 2) is outside the known range of the species, and/or 3) is isolated from the nearest known extant populations by development or otherwise unsuitable habitat. For example, the federally endangered Bay

checkerspot butterfly (*Euphydryas editha bayensis*) is known to occur on serpentine habitats where its primary larval host plant (*Plantago erecta*) is present.

According to the Updated Biological Resources Report, the project site does not support any of the host plants required by this species, and is outside of the currently known distribution for the species; the nearest plant species has been recorded 1.5 miles south of the project site. Additional special-status wildlife species that are not expected to occur on the project site for reasons similar to those outlined above include the western bumblebee (*Bombus occidentalis*), Monterey roach (*Lavinia symmetricus subditus*), California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii*), California tiger salamander (*Ambystoma californiense*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), least Bell's vireo (*Vireo bellii pusillus*), loggerhead shrike (*Lanius ludovicianus*), yellow-breasted chat (*Icteria virens*), tricolored blackbird (Agelaius tricolor), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), San Joaquin kit fox (*Vulpes macrotis mutica*), American badger (*Taxidea taxus*), and Townsend's big-eared bat (*Corynorhinus townsendii*).

According to the Updated Biological Resources Report, several other special-status wildlife species, such as the monarch butterfly, long-eared owl (*Asio otus*), western red bat (*Lasiurus blossevillii*), pallid bat (*Antrozous pallidus*), and mountain lion are expected to occur on the project site only as uncommon to rare visitors, migrants, or transients. However, such species are not expected to breed on the project site in any numbers, or to be affected by project implementation.

H.T. Harvey & Associates determined that four special-status wildlife species (south-central California coast steelhead, southwestern pond turtle [*Actinemys marmorata]*, white-tailed kite [*Elanus leucurus]*, and yellow warbler [*Setophaga petechia])* have the potential to occur somewhat more regularly on or near the project site and to breed at the project site. While high-quality floral resources are currently absent from the project site, the Updated Biological Resources Report also determined the Crotch's bumblebee has a low potential to occur on the project site. As previously noted, the project site is located within the boundaries of the SCVHP, which provides take authorization for 18 listed and non-listed species (i.e., covered species). Of the five special-status wildlife species listed above, only the southwestern pond turtle is a covered species under the SCVHP.

The proposed project's potential to result in adverse effects to the five special-status wildlife species identified above, as well as any additional nesting raptors and migratory birds protected by the MBTA, is discussed in further detail below.

South Central California Coast Steelhead

South central California coast steelhead spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating to the ocean. South central California coast steelhead are historically known to occur in Llagas Creek and may still occur in wet years. According to the Updated Biological Resources Report, the project site is located within the portion of Llagas Creek that supports potential spawning habitat for the south central California coast steelhead. However, due to insufficient flows and long reaches of degraded habitat downstream, migrating steelhead have difficulty moving between upper Llagas Creek and the Pajaro River and, as a result, occurrences of the south central California coast steelhead within Llagas Creek at the project site would be limited.

Furthermore, as discussed in the Updated Biological Resources Report, the proposed project is not anticipated to have a direct impact within the bed, banks, or riparian habitat along Llagas Creek, and indirect impacts on Llagas Creek, water quality within the channel, or fish species inhabiting the river are not expected to occur as a result of project activities. The project would maintain a setback of at least 100 feet from the top of bank of Llagas Creek. Additionally, the project would be required to comply with all SCVHP conditions, including Condition 3, which requires implementation of design phase, construction phase, and post-construction phase measures, including programmatic BMPs, performance standards, and control measures, to minimize increases of peak discharge of stormwater and to reduce runoff of pollutants to protect water quality, including during construction. As further discussed in Section X, Hydrology and Water Quality, of this IS/MND, impacts related to the water quality of Llagas Creek, which could affect south central California coast steelhead, would not occur during project construction or operations. Given the project's design, compliance with SCVHP conditions, and compliance with stormwater permits, development of the proposed project is not anticipated to result in an adverse impact to any south central California coast steelhead present within Llagas Creek on or near the project site.

Southwestern Pond Turtle

Habitat for the southwestern pond turtle include ponds, slow-moving streams and rivers, irrigation ditches, and reservoirs with abundant emergent and/or riparian vegetation. According to the Updated Biological Resources Report, southwestern pond turtles have been observed in Lake Silveira downstream from the project site. Turtles are unlikely to reside and nest on the project site due to the lack of high-quality basking sites; however, turtles may occasionally disperse through the project site. Therefore, the potential exists for the southwestern pond turtle to nest in upland areas on the project site.

According to the Updated Biological Resources Report, the southwestern pond turtle is covered by the SCVHP and the species would benefit from the SCVHP conservation program. In addition, the project applicant would be required to pay SCVHP fees and comply with the SCVHP conditions. As discussed in the Updated Biological Resources Report, the payment of SCVHP fees and compliance with SCHVP conditions and potential loss of individual southwestern pond turtles would not be significant because the SCVHP is expected to have a net benefit on the conservation of the species. However, as discussed in the Updated Biological Resources Report, development of the proposed project could result in the loss of potential nesting habitat for the southwestern pond turtle. Therefore, if southwestern pond turtles are present on or near the project site, development of the proposed project could result in an adverse impact to the species.

White-Tailed Kite

White-tailed kites require open habitats such as grassy plains, agricultural fields, open oak woodlands, and marshes. White-tailed kites nest in tall shrubs and trees. White-tailed kite nests were not observed on the project site during the site reconnaissance surveys conducted by H.T. Harvey & Associates; however, a pair of kites were observed foraging in the ruderal grassland/agricultural habitat during the 2012 reconnaissance surveys. As a result, a pair of white-tailed kites could potentially nest in trees on or adjacent to the site and could forage on the site.

As discussed in the Updated Biological Resources Report, development of the proposed project could result in the loss of potential nesting and foraging habitat for the white-tailed kite. Due to the very limited extent of potential habitat for the white-tailed kite that may be

impacted by the project, relative to regionally available habitat, the loss of habitat for the species would not be substantial. However, vegetation removal or construction during the nesting season could potentially result in the loss or disturbance of active nests of the white-tailed kite. Even if these species nest outside immediate impact areas, implementation of the proposed project could lead to increased disturbance near an active nest, which could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Because the loss of any active nests of protected birds would be in violation of federal and State laws, the proposed project could result in adverse impacts to the white-tailed kite, and a potentially significant impact could occur.

Yellow Warbler

The yellow warbler nests in dense stands of willow and other riparian habitat. According to the Updated Biological Resources Report, breeding yellow warblers have been confirmed upstream of the project site on Llagas Creek and the potential exists for the yellow warbler to nest in riparian habitat located at the project site. As discussed in the Updated Biological Resources Report, development of the proposed project could result in the loss of potential foraging habitat for the yellow warbler. Due to the very limited extent of habitat for the yellow warbler that may be impacted by the project, relative to regionally available habitat, the loss of habitat for the species would not be substantial.

However, vegetation removal or construction during the nesting season could potentially result in the loss or disturbance of active nests of the yellow warbler. Implementation of the proposed project could lead to increased disturbance near an active nest, located on-site or in the vicinity of the site, which could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Because the loss of any active nests of protected birds would be in violation of federal and State laws, the proposed project could result in adverse impacts to the yellow warbler, and a potentially significant impact could occur.

Crotch's Bumblebee

Crotch's bumblebee may occur regionally and is a candidate for listing under the California Endangered Species Act due to concerns about potential population declines and range contractions. Habitat for the Crotch's bumblebee includes open grassland and scrub habitats with abundant flowers providing nectar and pollen and with subterranean nest sites (such as animal burrows). Occurrences of Crotch's bumblebee have been documented throughout Santa Clara County. However, Crotch's bumblebee is unlikely to occur or nest at the project site due to a lack of high-quality floral resources at the project site. Nevertheless, Crotch's bumblebee has the potential to occasionally occur and nest on the site.

Based on the above, development of the proposed project could result in the loss of potential nesting and foraging habitat for Crotch's bumblebee. Therefore, if Crotch's bumblebees are present on or near the project site, development of the proposed project could result in an adverse impact to the species.

Nesting Migratory Birds and Raptors

According to the Updated Biological Resources Report, although not documented in the CNDDB search, various other nesting and migratory birds protected by the MBTA have been documented within the region including tricolored blackbird. The habitat along Llagas Creek is mapped by the SCVHP Geobrowser as a tricolored blackbird survey area;

however, tricolored blackbirds have not been recorded nesting on or near the project site. Suitable vegetation for nesting by tricolored blackbirds was not observed along Llagas Creek within 250 feet of the project site during the 2023 field survey due to the absence of emergent vegetation and the presence of a dense, mature tree canopy above the herbaceous vegetation along Llagas Creek. Thus, tricolored blackbird nesting colonies are not expected to occur on or within 250 feet of the site.

However, project construction activities, including initial site grading, soil excavation, and/or tree and vegetation removal occurring during the nesting period for migratory birds (typically between February 1 to August 31) could have the potential to result in nest abandonment or death of any live eggs or young, should migratory birds or their nests be present within or near the project site. In such an event, the proposed project could result in adverse impacts to nesting migratory birds and raptors and a potentially significant impact could occur.

Potential Impacts to Special-Status Wildlife Species as a Result of Increased Lighting

Redevelopment of the project site with 14 residences would add new sources of light and glare to the site, such as interior lights which could spill from the windows of the proposed residences and lights from vehicles. However, the light associated with the proposed project would be expected to be similar to that of the surrounding area. Depending on the location, direction, and intensity of exterior lighting, such lighting could potentially spill into adjacent natural areas along Llagas Creek, thereby increasing the lighting compared to existing conditions. Many animals are sensitive to light cues, which influence their physiology and shape their behaviors, particularly during the breeding season. For example, species may avoid well-lit areas, resulting in a net loss of habitat availability and quality. Wildlife species dispersed along Llagas Creek may be subject to increased predation, decreased habitat availability (for species that show aversions to increased lighting), reluctance to disperse through the project site, and alterations of physiological processes if development under the proposed project produces appreciably greater illuminance than the existing conditions. As previously discussed in Section I, Aesthetics, of this IS/MND, new sources of lighting would be required to comply with the standards set forth in the City's Architectural Review Handbook for single-family residences, as well as Sections 15.40.310 and 15.40.420 of the Morgan Hill Municipal Code, which would require all lighting to be shielded. Compliance with such requirements would minimize potential impacts to species related to spillover of light created by the proposed project.

Conclusion

Based on the above, development of the proposed project would not result in any substantial adverse effects to special-status plants, as the disturbed nature of the site and the lack of suitable habitat precludes the likely occurrence of such species on the site. However, the site provides potential habitat for southwestern pond turtle, Crotch's bumblebee, and nesting migratory birds and raptors protected by the MBTA, including the special-status white-tailed kite and yellow warbler. Such species could occur on the project site during construction activities associated with the proposed project. As such, the project could have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special status-species in local or regional plans, policies, or regulations, or by the CDFW or USFWS, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

Southwestern Pond Turtle

IV-1. *A southwestern pond turtle survey shall be conducted by a qualified biologist no more than 48 hours prior to construction in the portion of the project site where construction activities overlap within 100 feet of Llagas Creek. The results of the survey shall be submitted to the City of Morgan Hill Development Services Department.*

If southwestern pond turtles or nests are not found, further mitigation is not necessary. If a southwestern pond turtle is observed within the proposed impact area, a qualified biologist shall relocate the individual to habitat of equivalent or greater value (e.g., riparian wetlands or riparian woodlands adjacent to a perennial creek or intermittent drainage) outside of the proposed impact area prior to construction. If a southwestern pond turtle nest is observed within the proposed impact area, the nest shall be fenced off and avoided until the eggs hatch. The exclusion fencing shall be placed no less than 25 feet from the nest. A qualified biologist shall monitor the nest daily during construction to ensure that hatchlings do not disperse into the construction area. Relocation of hatchlings shall occur as stipulated above, if necessary.

Crotch's Bumblebee

IV-2. *Initial ground-disturbing activities associated with development of the project site (e.g., grading, vegetation removal, staging) should take place between September 1 and March 31 (i.e., outside the colony active period) to avoid potential impacts on special-status bumblebees. If initial ground-disturbing activities does not occur between September 1 and March 31, then at a maximum of 14 days prior to the commencement of construction activities, a qualified biologist with 10 or more years of experience conducting biological resource surveys within California shall conduct a preconstruction survey for special-status bumblebees in the area(s) proposed for impact.*

The survey shall occur during the period from one hour after sunrise to two hours before sunset, with temperatures between 65 degrees Fahrenheit and 90 degrees Fahrenheit, with low wind and zero rain. If the timing of the start of construction makes the survey infeasible due to the temperature requirements, the surveying biologist shall select the most appropriate days based on the National Weather Service seven-day forecast and shall survey at a time of day that is closest to the temperature range stated above. The survey duration shall be commensurate with the physical extent of suitable floral resources (which represent foraging habitat) present within the area proposed for impact, and the level of effort shall be based on the metric of a minimum of one person-hour of searching per three acres of suitable floral resources/foraging habitat. A meandering pedestrian survey shall be conducted throughout the area proposed for impact in order to identify patches of suitable floral resources.

Suitable floral resources for Crotch's bumblebee include species in the following families: Apocynaceae, Asteraceae, Boraginaceae, Fabaceae, and Lamiaceae. Suitable floral resources for western bumblebee include species in the following families: Asteraceae, Fabaceae, Rhamnaceae, and Rosaceae, as well as plants in the genera Eriogonum and Penstemon.

At a minimum, preconstruction survey methods shall include the following:

- *Search areas with floral resources for foraging bumblebees. Observed foraging activity may indicate a nest is nearby, and therefore, the survey duration shall be increased when foraging bumblebees are present;*
- *If special-status bumblebees are observed, watch any special-status bumblebees present and observe their flight patterns. Attempt to track their movements between foraging areas and the nest;*
- *Visually look for nest entrances. Observe burrows, any other underground cavities, logs, or other possible nesting habitat;*
- *If floral resources or other vegetation preclude observance of the nest, small areas of vegetation may be removed via hand removal, line trimming, or mowing to a height of a minimum of four inches to assist with locating the nest;*
- *Look for concentrated special-status bumblebee activity;*
- *Listen for the humming of a nest colony; and*
- *If bumblebees are observed, attempt to photograph the individual and identify it to species.*

The biologist conducting the survey shall record when the survey was conducted, a general description of any suitable foraging habitat/floral resources present, a description of observed bumblebee activity, a list of bumblebee species observed, a description of any vegetation removed to facilitate the survey, and their determination of if survey observations suggest a special-status bumblebee nest(s) may be present or if construction activities could result in take of special-status bumblebees. The report shall be submitted to the Morgan Hill Development Services Department prior to the commencement of construction activities.

If bumblebees are not located during the preconstruction survey or the bumblebees located are definitively identified as a common species (i.e., not special-status species), then further mitigation or coordination with the California Department of Fish and Wildlife (CDFW) is not required.

If any sign(s) of a bumblebee nest is observed, and if the species present cannot be established as a common bumblebee, then construction shall not commence until either (1) the bumblebees present are positively identified as common (i.e., not a special-status species), or (2) the completion of coordination with CDFW to identify appropriate mitigation measures, which may include, but not be limited to, waiting until the colony active season ends, establishment of nest buffers, or obtaining an Incidental Take Permit (ITP) from CDFW.

Nesting Migratory Birds and Raptors

IV-3. *Construction activities shall be scheduled to avoid the nesting season for most birds in Santa Clara County (February 1 through August 31). If construction activities are scheduled to take place outside the nesting season, all impacts to nesting birds protected under the MBTA and California Fish and Game Code would be avoided.*

If construction activities and/or tree removal are proposed during nesting season (February 1 to August 31), a preconstruction survey for nesting birds and other protected migratory birds shall be conducted by a qualified ornithologist, consistent with conditions set forth by the SCVHP to ensure that nests are not disturbed during project implementation. The survey shall be submitted to the City of Morgan Hill Development Services Department for review no more than seven days prior to the start of construction.

The survey shall be conducted no more than seven days prior to the initiation of demolition or construction activities, including tree removal and pruning. During this survey, the ornithologist shall inspect all trees and other potential nesting habitats (e.g., trees, shrubs, ruderal grasslands, buildings) in and immediately adjacent to the impact areas for nests. If an active nest is observed during the survey, the ornithologist shall determine the extent of a construction-free buffer zone to be established around the nest (typically 300 feet for raptors and 100 feet for other species), to ensure that no nests of species protected by the MBTA and California Fish and Game Code shall be disturbed during project implementation.

b,c. During the reconnaissance-level surveys, H.T. Harvey & Associates identified six SCVHP land cover types within the project footprint: orchard (12.44 acres), California annual grassland (2.31 acres), ornamental woodland (1.19 acres), mixed riparian woodland and forest (1.43 acres), perennial stream (0.19 acre), and urban-suburban (1.01 acres). The distribution of the land cover types at the project site are presented in Figure 9.

The Updated Biological Resources Report identified approximately 0.19-acre of sensitive aquatic habitat along Llagas Creek on the project site. As required by the SCVHP, the project's developed areas would maintain a minimum 100-foot buffer from top of bank, and a buffer of at least 35 feet from the edge of the riparian canopy along Llagas Creek. Therefore, the proposed project is not anticipated to have a direct or indirect impact on riparian habitat.

H.T. Harvey & Associates also determined that on-site wetlands and other waters of the U.S/State are located within the Llagas Creek corridor. The Updated Biological Resources Report concluded that the project design avoids all direct and indirect impacts on State or federally protected wetlands and aquatic habitats and maintains a buffer from such habitats. Therefore, wetland or aquatic habitat would not be impacted directly or indirectly by the project.

Based on the above, the proposed project would not have a substantial adverse effect on riparian habitat, sensitive natural communities, or federally protected wetlands, and a ***less-than-significant*** impact would occur.

Figure 9
Land Cover Types

d. Movement corridors or landscape linkages are usually linear habitats that connect two or more habitat patches, providing assumed benefits to the species by reducing inbreeding depression and increasing the potential for recolonization of habitat patches. The project site is surrounded by single-family residences to the northeast, across Santa Teresa Boulevard; Llagas Creek, a single-family residence, and oak trees to the southeast; single-family residences to the southwest; and a seasonal fruit stand, agricultural land, and single-family residences to the northwest, across Watsonville Road.

According to the Updated Biological Resources Report, because the project site is located outside of extensive, dense residential development in the City of Morgan Hill, wildlife moving around the outskirts of the City have the potential to occur on the project site. For example, mule deer, bobcats, coyotes, gray foxes, and other mammals may occasionally disperse through the project site. Although such species may occur anywhere on the site, the dense vegetation of the Llagas Creek corridor provides the highest-quality cover for dispersing animals. A number of aquatic species, such as fish and amphibians, disperse along Llagas Creek, which provides a high-quality dispersal corridor.

Following project construction, animal movement along Llagas Creek may be reduced as a result of the increase in human activity, noise, light, domestic animals, and other urban-related factors on the project site. However, as discussed above, the project would maintain a minimum 100-foot buffer from the top of bank along Llagas Creek, and a minimum buffer of 35 feet from the edge of the riparian canopy associated with Llagas Creek. As such, the proposed buffers would maintain an adequate corridor for wildlife movement along Llagas Creek, and the project would not interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors or impede the use of wildlife nursery sites. Thus, a ***less-than-significant*** impact would occur.

e. Section 12.32.030 (Permit-Required) of the City of Morgan Hill's Municipal Code requires the approval of a tree removal permit prior to the removal of any Ordinance Sized Trees, defined as a non-indigenous tree with a circumference greater than 40 inches (approximately 12.7-inch diameter), or any indigenous tree with circumference greater than 18 inches (approximately 5.7 inches diameter) measured at 4.5 feet vertically above the ground or immediately below the lowest branch. According to the City's Municipal Code Section 12.32.020, non-indigenous tree species in residential zones and orchards (including individual fruit trees) are not considered Ordinance Sized Trees. Indigenous tree means any tree native to the Morgan Hill region, such as oaks (all types), Sycamore, California Bay, Madrone, or Alder.

An Arborist Report was prepared for the proposed project by Moki Smith Tree Specialists, Inc. (see Appendix C).[10] As noted above, non-indigenous tree species in residential zones and orchards are not considered Ordinance Sized Trees. Therefore, the existing on-site trees associated with the former orchard were not inventoried as part of the Arborist Report. Based on the Arborist Report, a total of 24 trees are located on the project site surrounding the existing on-site structures, including 13 indigenous Live Oak trees and one indigenous coastal Live Oak tree. The Arborist Report also identified one bottle tree, one coastal redwood, one deodar cedar, three Modesto ash, one incense cedar, one pecan, one fruitless mulberry, and one English walnut. Of the 24 on-site trees inventoried in the Arborist Report, two trees were determined to be in excellent condition, seven trees

[10] Moki Smith Tree Specialists, Inc. *Arborist Report.* June 25, 2022.

were determined to be in good condition, 12 were determined to be in fair condition, and three were determined to be in poor condition. Based on the definition of indigenous trees outlined in City's Municipal Code Section 12.32.020, the 14 existing oak trees would be classified as indigenous Ordinance Sized Trees. As part of the proposed project, several of the existing oak trees would be retained, particularly surrounding the existing on-site structures. However, several trees will need to be removed as part of the proposed project.

As shown in Figure 6 of this IS/MND, the Preliminary Landscape Plan, an assortment of shrubs and 24-inch box trees, including indigenous Marina madrone and coastal live oaks, and non-indigenous western redbud, hollyleaf cherry, Chinese pistache, and Chinese elm would be planted along the Watsonville Road frontage, a portion of the Santa Teresa Boulevard frontage, and along all internal roadways.

Without approval of a Tree Removal Permit and implementation of a tree replacement/preservation plan for any indigenous Ordinance Sized Trees to be preserved on or adjacent to the site, the proposed project could have a ***potentially significant*** impact related to conflicting with local policies or ordinances protecting biological resources, particularly related to Chapter 12.32 (Restrictions on Removal of Significant Trees) of the City's Municipal Code.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

IV-4. *The project applicant shall obtain a Tree Removal Permit prior to the removal of any Ordinance Sized Trees as defined by the City. The project applicant shall mitigate for the removal of the Ordinance Sized Trees located within the project site, as identified in the Arborist Report prepared by Monk Smith Tree Specialists, Inc. for the proposed project, by providing an on-site replacement planting at a minimum 1:1 ratio with 15-gallon minimum size trees.*

For the Ordinance Sized Trees to be preserved as part of the project, the project applicant shall implement Tree Preservation Recommendations, including, but not limited to, the following

- *Include tree identification numbers, protection fence locations, and preservation and guidelines on all the project plans, or alternatively create a separate plan sheet that includes all tree protection measures labeled "T-1 Tree Protection Plan;"*
- *Place a protection fence around the trees to be retained at a radius of eight times the diameter at breast height (DBH);*
- *Install temporary irrigation or soaker hoses in the Tree Protection Zones (TPZs);*
- *Monitor watering times or amounts to ensure adequate soil saturation;*
- *All tree maintenance and care shall be performed by a qualified arborist with a C-61/D-49 California Contractors License. Tree maintenance and care shall be specified in writing according to American National Standard for Tree Care Operations: Tree, Shrub*

and Other Woody Plant Management: Standard Practices parts 1 through 10 and adhere to ANSI Z133.1 safety standards and local regulations. All maintenance is to be performed according to ISA Best Management Practices;

- *Implement general tree protection guidelines including recommendations for arborist assistance while working under trees, trenching, or excavation within a tree's drip line or designated TPZ/Critical Root Zone (CRZ);*
- *Provide a copy of the Arborist Report to all contractors and project managers, including the architect, civil engineer, and landscape designer or architect; and*
- *Arrange a pre-construction meeting with the project arborist or landscape architect to verify tree protection is in place, with the correct materials, and at the proper distances.*

The above measures shall be included in the notes on construction drawings, subject to review and approval by the City of Morgan Hill Development Services Department, prior to initiation of construction.

f. As noted above, the project site is located within the boundaries of the SCVHP permit area. The SCVHP was developed through a partnership between Santa Clara County, the cities of San José, Morgan Hill, and Gilroy, the SCVWD, the Santa Clara VTA, the USFWS, and the CDFW. The SCVHP is intended to promote the recovery of endangered species and enhance ecological diversity and function, while accommodating planned growth in approximately 500,000 acres of southern Santa Clara County. The SCVHP provides take authorization for 18 covered species and includes conservation measures to protect the species covered by the SCVHP, as well as a conservation strategy designed to mitigate impacts on covered species and contribute to the recovery of the species in the study area. According to the SCVHP, the project site is designated as a "Rural Residential" land cover type.

Compliance with the SCVHP requires payment of fees according to the Fee Zone designation of the property, payment of nitrogen deposition fees related to the number of anticipated car trips resulting from the development, and any surcharge fees that are required based on site-specific impacts to sensitive habitats or sensitive species. The project site is within Fee Zone B (Agricultural and Valley Floor Lands).[11] As such, the proposed project would be subject to Zone B fees, which are currently $17,698 per acre (2023-2024 rates).[12] In addition, the project would be subject to nitrogen deposition fees, which, as of 2023, are $6.33 for each new vehicle trip and $59.86 for each new single-family residence. For any temporary impacts, all the same fees are applied, but at a fraction of the total cost, depending on how long the project expects the temporary impact to last.

In addition to fees, the proposed project would be required to comply with applicable conditions of the SCVHP. Compliance with such conditions would be ensured with

[11] Santa Clara Valley Habitat Agency. *Geobrowser v2.0.* Available at: https://scvha.maps.arcgis.com/apps/webappviewer/index.html?id=f2268679c2fa49489e3f7d6e8377837e. Accessed June 2024.

[12] Santa Clara Valley Habitat Agency. *Habitat Agency Fee Schedule: July 1, 2023 through June 30, 2024.* Available at: https://www.scv-habitatagency.org/206/Habitat-Agency-Fee-Schedule. Accessed June 2024.

implementation of Mitigation Measures IV-1 and IV-3. However, should the proposed project not fulfill payment of necessary fees, the project could conflict with the SCVHP. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

IV-5. *Prior to issuance of a grading permit for the proposed project, the owner or designee shall pay the Santa Clara Valley Habitat Plan per-acre fee in effect for the appropriate fee zone of the project site, as determined by the Santa Clara Valley Habitat Agency, in compliance with Section 18.132.050 of the Morgan Hill Municipal Code.*

V. CULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	✖	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	☐	☐	✖	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries.	☐	☐	✖	☐

Discussion

The following discussion is primarily based on a Historic Resources Evaluation (HRE)[13] (see Appendix D) and Extended Phase I (XPI) Archaeological Study[14] prepared for the proposed project by Evans & De Shazo, Inc. (EDS).

a. As part of the HRE, EDS conducted archival research to assess the history of the project site and surrounding area in order develop a historical context and evaluate the historical significance of the existing on-site structures, including the Barney Machado Barn, single-family residence, detached garage, and associated landscape, which consists of the remnants of a walnut orchard and 24 trees. The Barney Machado Barn is located on proposed Lot 5 of the Tentative Map for the proposed project and would be retained on-site as part of the project. Nevertheless, this discussion addresses the barn and whether it is considered historically significant as such a determination could have implications for the overall project design. The remaining on-site structures would be demolished or removed to accommodate the proposed project.

The Barney Machado Barn was constructed circa 1883, the detached garage was constructed circa 1955, and the single-family residence was constructed circa 1966. The HRE consisted of a literature review of documents obtained at the Northwest Information Center (NWIC) of the California Historical Information System (CHRIS), including primary resources records associated with the project site and cultural resource inventories, including the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), California Inventory of Historical Resources, California Office of Historic Preservation (OHP) Built Environment Resources Directory (BERD) for Santa Clara County, California, Santa Clara County Heritage Resource Inventory (updated May 16, 2023), and the City of Morgan Hill Historic Resource Inventory. EDS also conducted in-person research at the Santa Clara County Assessor and Recorder Office and online research. In addition, EDS reviewed digital files maintained by EDS, including historical maps, aerial photographs, and other primary source documents.

According to the HRE, none of the existing on-site structures are listed on the OHP BERD; however, the Barney Machado Barn is currently listed within the County of Santa Clara Heritage Resource Inventory List and the barn is considered to be a historical resource in accordance with CEQA regulations and guidelines due to its local listing. According to the HRE, the previous documentation of the existing structures, which the County of Santa

[13] Evans and De Shazo, Inc. *Historic Resources Evaluation for the Blackrock (Quail Vineyards) Project at 14905 Santa Teresa Boulevard, Morgan Hill, Santa Clara County, California.* April 5, 2024.

[14] Evans and De Shazo, Inc. *Results of an Extended Phase I (XPI) Archaeological Study for the Proposed Quail Vineyards Project at 14905 Santa Teresa Boulevard, Morgan Hill, Santa Clara County, California.* June 4, 2024.

Clara Heritage Resource Inventory List relied on to make their determination, contain discrepancies related to the date of construction and ownership history. The City of Morgan Hill retained EDS to conduct an independent review of the on-site structures and provide recommendations, based on substantial evidence, as to whether the on-site structures, particularly the Barney Machado Barn, meet the criteria for listing on the CRHR and/or NRHP. EDS conducted a historic architectural survey of the project site, including the Barney Machado Barn, single-family residence, detached garage, and associated landscape on February 22, 2024. The purpose of the historic architectural survey was to identify the age, any known architectural style, design, form, character-defining features, materials, and alterations of built environment resources associated with the Barney Machado Barn, single-family residence, detached garage, and associated landscape.

The National Park Service's "Research and Documentation of Historic Orchards and Fruit Trees" states that orchards or fruit trees are frequently recognized as historically important features for their contribution to the significance and integrity of larger sites or historic districts that are listed in the NRHP. Based on the National Park Service guidance, EDS also evaluated the historical significance of the walnut orchard, which was planted in the late 1950s or early 1960s.

Based on the approximate years of construction for each structure, the barn, single-family residence, detached garage, and associated landscape meet the age threshold (50 years) for consideration as historic resources. In order to determine whether the on-site structures are historically significant, the structures would be required to undergo evaluation using the NRHP and the CRHR eligibility criteria.

The NRHP and CRHR eligibility criteria include the following:

(1)/(A) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
(2)/(B) It is associated with the lives of persons important to local, California, or national history;
(3)/(C) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
(4)/(D) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resources must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. The resource must be at least 50 years old, except in exceptional circumstances.

The eligibility of the Barney Machado Barn, single-family residence, detached garage, and associated landscape to be considered a significant historical resource, pursuant to NRHP/CRHR criteria, is discussed in further detail below.

NRHP/CRHR Criteria A/1

According to the HRE, the project site, including the Barney Machado Barn and residence, are not associated with any events that made a significant contribution to the broad patterns of California's history or cultural heritage. Therefore, the project site and existing structures are not eligible for the NRHP/CRHR under Criteria A/1.

NRHP/CRHR Criteria B/2

According to the HRE, the project site was once part of the 22,283-acre Rancho San Francisco de las Llagas, owned by brothers Martin Murphy Jr. and James Murphy. The brothers were part of the pioneer Murphy family and the first wagon party, the Stephens-Townsend-Murphy Party, to arrive in California by way of the Sierra Nevada route. Although the Murphy family were early California pioneers, and James Murphy, as well as other Murphy family members, did make a significant impact on California and local history, neither James nor any members of the Murphy family lived within or utilized any of the current built environment or associated landscape within the project site.

The Barney Machado Barn located at the project site was first associated with Bernard "Barney" Machado, who was the son-in-law of James Murphy. Bernard Machado was a farmer and lived within a single-family residence within the project site, which has since been demolished. Locally, Benard Machado was a known peach orchard farmer, and he and his wife Mary are most notably known for their land donations to the City of Morgan Hill and their monetary donation for the construction of the Machado School in 1895. However, Bernard Machado is not considered an important person in California history. The Barney Machado Barn and the project site, which was once part of the much larger farmland associated with Bernardo and Mary Machado, has changed significantly and does not retain integrity to convey association with Bernard or Mary Machado. Therefore, the project site is not eligible for inclusion on the NRHP/CRHR under Criterion B/2.

NRHP/CRHR Criteria C/3

The Barney Machado Barn was initially a front-facing gable form but currently consists of a front-facing gable with shed wing additions. While the original 1883 front-facing gable form is associated with Vernacular architecture, the 1930 wing shed additions and other alterations, such as the removal and replacement of all siding and covering of all openings and windows, to the barn changed the barn from fruit farming to housing grazing animals, such as cattle and sheep. As such, the Barney Machado Barn no longer retains integrity as a representative example of a Vernacular building associated with orchard farming in 1883. In addition, the barn is not constructed in a Vernacular style specific to Morgan Hill or local agriculture.

The residence was constructed in 1966 and displays the form and material found within Ranch architecture, which includes the side-facing gable, low-profile form, off-centered door, attached garage, and board and batten siding with aluminum windows. However, despite its association with this architectural style, the residence is a simple example of Ranch architecture and is not representative of the design. Furthermore, the residence was not designed by a known builder or master architect. In addition, the detached garage, which was constructed in 1955 is not associated with any architectural style or landscape.

The associated landscape consists of remnants of a walnut orchard and 24 trees. The previous walnut orchard was planted in the late 1950s or early 1960s. As previously noted, the National Park Service has stated that orchards or fruit trees are frequently recognized as historically important features for their contribution to the significance and integrity of larger sites or historic districts that are listed in the NRHP. Although the remnants of the walnut orchard are present on-site, the original property was planted in peach trees when the Barney Machado Barn was constructed and the Machado family occupied the property. Furthermore, the land surrounding the project site is primarily developed and no longer reflects the agricultural activities which historically occurred in the project area.

Based on the guidance by the National Park Service and the absence of a planned design, EDS determined that the remnants of the walnut orchard were not individually significant or associated with a district.

Based on the above, the Barney Machado Barn, single-family residence, detached garage and associated landscaping are not eligible for listing on the NRHP/CRHR under Criterion C/3. Furthermore, the Barney Machado Barn does not retain integrity to convey local significance.

NRHP/CRHR Criteria D/4

Criterion D/4 generally applies to resources that contain, or are likely to contain, information bearing on an important archaeological research question. In order to be eligible under Criterion D/4, a building must be a principal source of important information, such as exhibiting a local variation on a standard design or construction technique. The building can be eligible if a study can yield important information, such as how local availability of materials or construction expertise affected the evolution of local building development.

The Barney Machado Barn, though associated with Vernacular architecture, does not have the ability to convey information about the history of Vernacular design due to additions and alterations that have been made to the structures. In addition, the single-family residence, which is associated with Ranch architecture, does not have the ability to convey information about the history of Ranch design because the residence is a simple example of Ranch architecture and is not representative of the design As previously noted, the detached garage is not associated with any architectural style or landscape. Therefore, the Barney Machado Barn, single-family residence, detached garage, and associated landscape within the project site are not eligible for listing on the NRHP/CRHR under Criterion D/4.

CRHR Integrity Criteria

A property must possess significance under one or more of the above-listed criteria and have historic integrity to qualify for listing in the NRHP/CRHR. Seven variables, or aspects, are used to judge historic integrity, including location, design, setting, materials, workmanship, feeling, and association. A resource must possess the aspects of integrity that relate to the historical theme(s) and period of significance identified for the built-environment resources. National Register Bulletin 15 explains, “Only after significance is fully established can you proceed to the issue of integrity.”

The Barney Machado Barn remains at its original location where it was constructed and retains integrity of the location. The setting of the Barney Machado Barn has changed significantly due to the lack of the Barney Machado residence. For example, the project site is no longer used for agricultural activities and the surrounding neighborhoods are developed. As previously noted, although the remnants of the walnut orchard are present on-site, the original property was planted in peach trees when the Barney Machado Barn was constructed. Therefore, neither the Barney Machado Barn nor the project site retain integrity of setting.

As discussed above, the Barney Machado Barn has undergone several alterations that significantly altered the original design and only the front-facing gable form remains from the original 1883 design. In addition, the alterations changed the design of the building as

it appeared during the time it was associated with Bernard and Mary Machado and retains very little evidence of workmanship from the 1883 construction. Therefore, the barn does not retain integrity of design, materials, or workmanship from the time Bernard and Mary Machado owned the property from 1883 to 1908.

Due to significant alterations, the Barney Machado Barn does not convey the feeling of a barn used for orchard farming in the late 1800s and early 1900s. In addition, the feeling of the surrounding landscape has changed significantly with the construction of the residence and detached garage and the removal of the peach trees. Although the land has the feeling of a former farm, the removal of the original Barney Machado residence and the lack of an organized and maintained fruit orchard significantly limits integrity of feeling associated with Bernard and Mary Machado. Therefore, the Barney Machado Barn does not retain integrity of feeling from the time Bernard and Mary Machado owned the property from approximately 1883 to 1908.

As previously discussed, while the barn is associated with Vernacular architecture, as well as Bernard and Mary Machado, because of the significant changes to the barn and property, including the removal of the peach trees and demolition of the Barney Machado residence, the project site does not retain an association with Bernard or Mary Machado and their agricultural pursuits. As a result, the Barney Machado Barn does not retain integrity of association with Bernard and Mary Machado from 1883 to 1908.

Based on the above, EDS determined that the Barney Machado Barn does not retain enough integrity of setting, design, materials, workmanship, feeling, and association to convey the building's historical significance associated with the Vernacular architecture, as well as Bernard and Mary Machado.

Conclusion

Overall, EDS concluded that the project site, including the Barney Machado Barn, single-family residence, detached garage, and associated landscape are not eligible for inclusion on the CRHR because the property does not meet any of the CRHR criteria.

As previously discussed, the County of Santa Clara Heritage Resource Inventory lists the Barney Machado Barn as a historical resource and, as a result, the barn would be considered a historical resource under CEQA due to the local listing. However, the HRE and updated Department of Parks and Recreation (DPR) 523 forms prepared by EDS for the proposed project provide substantial evidence that the barn is not historically significant and should not be treated as a historical resource in accordance with CCR 1564.5. As a result, EDS recommends that the City request that the County of Santa Clara remove the Barney Machado Barn from the County of Santa Clara Heritage Resource Inventory. If the barn is removed from the County's listing, the barn would no longer be considered a historical resource under CEQA. Nonetheless, the barn would be avoided as part of the proposed project and would be retained on Lot 5, and therefore, development of the proposed project would not adversely affect the Barney Machado Barn.

Based on the above, development of the site would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5. Therefore, a ***less-than-significant*** impact would occur.

b,c. In 2012, Holman & Associates completed an Archaeological Study as part of the proposed Santa Teresa – Black Rock Residential Project at the project site. The 2012 Archaeological Study identified one CRHR-eligible precontact site (P-43-000640 [CA-SCL-722]) adjacent to the project site, one prehistoric artifact (a chert scraper) within the project site, and a concentration of historic period artifacts near the Barney Machado Barn.

As part of the XPI Archaeological Study prepared for the proposed project, EDS conducted a record search at the NWIC to obtain the resource record for P-43-000640 (CA-SCL-722), as well as associated archaeological reports. On May 14 and May 15, 2024, EDS excavated 20 hand-auger bores throughout the project site, including along Llagas Creek and in the area nearest to the recorded location of P-43-000640 (CA-SCL-722), to inspect the project site for evidence of precontact archaeological resources. Each hand auger was excavated in 20-centimeter (cm) levels, with most augers extending to 100 cm (3.28 feet) below the current surface grade. The excavations yielded five historic period artifacts, including: one undiagnostic fragment of colorless glass; one corroded fastener, possibly a nail fragment; one saw cut mammal bone; one wire nail; and one piece of ferrous metal. Of the historic period artifacts observed, one was found from 0-20 cm, two were found from 20-40 cm, one was found from 40-63 cm, and one was found from 80-100 cm below the surface. However, the aforementioned historic period artifacts were not determined to be significant.

The XPI Archaeological Study did not identify any potentially significant archaeological resources and determined that P-43-000640 (CA-SCL-722) does not extend into the project site. Therefore, the proposed project would not impact any known precontact archaeological resources. While the project site has been subject to ground disturbance associated with past development and agricultural activities, unknown archaeological resources, including human remains, have the potential to be uncovered during future ground-disturbing construction and excavation activities at the subject property.

In the event that such resources are unearthed during ground disturbing activities (i.e., any activity that exposes, works or redistributes soil, including but not limited to excavating, filling, stockpiling, grading, grubbing, or clearing), the following City standard conditions of approval related to the protection of archaeological resources would be implemented, consistent with Section 18.60.090 of the City's Municipal Code:

A. The developer shall enter into written contracts with an archaeologist and the Tamien Nation Tribe, and pay all fees associated with the activities required by this condition. The following policies and procedures for treatment and disposition of inadvertently discovered human remains or archaeological materials shall apply:

1. Prior to start of grading or earthmoving activity (includes demolition and moving of heavy equipment on site) on the "first day of construction", the archaeologist and Tamien Nation Tribal Monitor shall hold a preconstruction meeting for the purposes of "cultural sensitivity training" with the general contractor and subcontractors.

2. An archaeologist and a Tamien Nation Tribal Monitor shall be present on-site to monitor all ground disturbing activities and an archaeologist shall be on-call. Where historical or archaeological artifacts are found, work in areas where remains or artifacts are found will be restricted or stopped until proper protocols are met, as described below:

a) Work at the location of the find will halt immediately within fifty feet of the find. If an archaeologist is not present at the time of the discovery, the applicant shall contact an archaeologist for evaluation of the find to determine whether it qualifies as a unique archaeological resource as defined by this chapter.

b) If the find is determined not to be a Unique Archaeological Resource, construction can continue. The archaeologist will prepare a brief informal memo/letter in collaboration with a tribal representative that describes and assesses the significance of the resource, including a discussion of the methods used to determine significance for the find;

c) If the find appears significant and to qualify as a unique archaeological resource, the archaeologist will determine if the resource can be avoided and will detail avoidance procedures in a formal memo/letter; and

d) If the resource cannot be avoided, the archaeologist in collaboration with a tribal representative shall develop within forty-eight hours an action plan to avoid or minimize impacts. The field crew shall not proceed until the action plan is approved by the Development Services Director. The action plan shall be in conformance with California Public Resources Code 21083.2.

3. The following policies and procedures for treatment and disposition of inadvertently discovered human remains or archaeological materials shall apply. If human remains are discovered, it is probable they are the remains of Native Americans,

a) If human remains are encountered, they shall be treated with dignity and respect as due to them. Discovery of Native American remains is a very sensitive issue and serious concern. Information about such a discovery shall be held in confidence by all project personnel on a need-to-know basis. The rights of Native Americans to practice ceremonial observances on sites, in labs and around artifacts shall be upheld.
b) Remains should not be held by human hands. Surgical gloves should be worn if remains need to be handled.
c) Surgical mask should also be worn to prevent exposure to pathogens that may be associated with the remains.

4. In the event that known or suspected Native American remains are encountered, or significant historic or archaeological materials are discovered, ground-disturbing activities shall be immediately stopped. Examples of significant historic or archaeological materials include, but are not limited to, concentrations of historic artifacts (e.g., bottles, ceramics) or prehistoric artifacts (chipped chert or obsidian, arrow points, ground stone mortars and pestles), culturally altered ash stained midden soils associated with pre-contact Native American habitation sites, concentrations of fire-altered rock and/or burned or charred

organic materials and historic structure remains such as stone lined building foundations, wells or privy pits. Ground-disturbing project activities may continue in other areas that are outside the exclusion zone as defined below.

5. An "exclusion zone" where unauthorized equipment and personnel are not permitted shall be established (e.g., taped off) around the discovery area plus a reasonable buffer zone by the contractor foreman or authorized representative, or party who made the discovery and initiated these protocols, or if on-site at the time or discovery, by the monitoring archaeologist and tribal representative (typically twenty-five to fifty feet for single burial or archaeological find).

6. The discovery locale shall be secured (e.g., 24-hour surveillance) as directed by the City or County if considered prudent to avoid further disturbances.

7. The Contractor Foreman or authorized representative, or party who made the discovery and initiated these protocols shall be responsible for immediately contacting by telephone the parties listed below to report the find and initiate the consultation process for treatment and disposition:

    - The City of Morgan Hill Development Services Director (408) 779-7247
    - The Contractor's Point(s) of Contact
    - The Coroner of the County of Santa Clara (if human remains found) (408) 793-1900
    - The Native American Heritage Commission (NAHC) in Sacramento (916) 653-4082
    - The Amah Mutsun Tribal Band (916) 481-5785 (H) or (916) 743-5833 (C)
    - The Tamien Nation (707) 295-4011 (office) and (925) 336-5359 (THPO)

8. The Coroner has two working days to examine the remains after being notified of the discovery. If the remains are Native American the Coroner has 24 hours to notify the NAHC.

9. The NAHC is responsible for identifying and immediately notifying the Most Likely Descendant (MLD). (Note: NAHC policy holds that the Native American Monitor will not be designated the MLD.)

10. Within 24 hours of their notification by the NAHC, the MLD will be granted permission to inspect the discovery site if they so choose.

11. Within 24 hours of their notification by the NAHC, the MLD may recommend to the City's Development Services Director the recommended means for treating or disposing, with appropriate dignity, the human remains and any associated grave goods. The

recommendation may include the scientific removal and non-destructive or destructive analysis of human remains and items associated with Native American burials. Only those osteological analyses or DNA analyses recommended by the appropriate tribe may be considered and carried out.

12. If the MLD recommendation is rejected by the City of Morgan Hill the parties will attempt to mediate the disagreement with the NAHC. If mediation fails then the remains and all associated grave offerings shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.

Compliance with the above standard conditions of approval would ensure that construction of the proposed project would result in a ***less-than-significant*** impact related to unique archeological resources, as well as the disturbance of human remains.

VI. ENERGY. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	✖	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	✖	☐

Discussion

a,b. The main forms of available energy supply are electricity, natural gas, and oil. A description of the 2022 California Green Building Standards Code (CALGreen Code) and the Building Energy Efficiency Standards, with which the proposed project would be required to comply, as well as discussions regarding the proposed project's potential effects related to energy demand during construction and operations are provided below.

California Green Building Standards Code

The 2022 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), is a portion of the CBSC, which became effective with the rest of the CBSC on January 1, 2023.[15] The purpose of the CALGreen Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California. Requirements of the CALGreen Code include, but are not limited to, the following measures:

- Compliance with relevant regulations related to future installation of electric vehicle (EV) charging infrastructure in residential and non-residential structures;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' MWELO, or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills;
- Incentives for installation of electric heat pumps, which use less energy than traditional heating, ventilation, and air conditioning (HVAC) systems and water heaters;
- Required solar PV system and battery storage standards for certain buildings; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

Building Energy Efficiency Standards

The 2022 Building Energy Efficiency Standards is a portion of the CBSC, which expands upon energy-efficiency measures from the 2019 Building Energy Efficiency Standards. The proposed project would be subject to all relevant provisions of the most recent update

[15] California Building Standards Commission. *2022 California Green Building Standards Code*. 2023.

of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code and Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently.

Construction Energy Use

Construction of the proposed project would involve on-site energy demand and consumption related to use of oil in the form of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and operation of off-road construction equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary on-site lighting, welding, and for supplying energy to areas of the site where energy supply cannot be met via a hookup to the existing electricity grid. Even during the most intense period of construction, due to the different types of construction activities (e.g., site preparation, grading, building construction), only portions of the project site and off-site improvement areas would be disturbed at a time, with operation of construction equipment occurring at different locations on the project site, rather than a single location. Project construction would not involve the use of natural gas appliances or equipment.

All construction equipment and operation thereof would be regulated by the CARB's In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. In addition, as a means of reducing emissions, construction vehicles are required to become cleaner through the use of renewable energy resources. The In-Use Off-Road Diesel Vehicle Regulation would therefore help to improve fuel efficiency for equipment used in construction of the proposed project. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to further reduce demand on oil and limit emissions associated with construction.

Based on the above, the temporary increase in energy use occurring during construction of the proposed project would not result in a significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, construction activities would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand.

Operational Energy Use

In response to the growing climate crisis, the City has determined that natural gas use in local buildings, which accounts for approximately one-third of the community's carbon footprint, represents the City's greatest opportunity to reduce future GHG emissions. Requiring all new buildings to be constructed without natural gas will dramatically reduce future emission growth as electricity procured by Silicon Valley Clean Energy is 100 percent carbon free. The City Council adopted Ordinance No. 2306 on November 6, 2019, which prohibits natural gas infrastructure in new buildings.

Following implementation of the proposed project, Pacific Gas & Electric (PG&E) would provide electricity to the project site. Energy use associated with operation of the proposed

project would be typical of residential uses, requiring electricity for interior and exterior building lighting, HVAC, electronic equipment, machinery, refrigeration, appliances, security systems, and more. Maintenance activities during operations, such as landscape maintenance, would involve the use of electric or gas-powered equipment. In addition to on-site energy use, the proposed project would result in transportation energy use associated with vehicle trips generated by the proposed residential development.

The proposed residential project would be subject to all relevant provisions of the most recent update of the CBSC, including the Building Energy Efficiency Standards. Adherence to the most recent CALGreen Code and the Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently through the incorporation of such features as efficient water heating systems, high performance attics and walls, and high efficacy lighting. Required compliance with the CBSC would ensure that the building energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary. In addition, electricity supplied to the project site by PG&E would comply with the State's Renewable Portfolio Standard (RPS), which requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 and to 60 percent by 2030. Thus, a portion of the energy consumed during operation of the proposed project would originate from renewable sources.

The CARB prepared the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan),[16] which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix D of the 2022 Scoping Plan provides suggestions for prioritizing various types of mitigation, such as on-site GHG-reducing design features and mitigation measures. Appendix D includes the methods to reduce vehicle miles traveled (VMT), support building decarbonization, and provide access to shared mobility services or transit, as well as EV charging. Appendix D provides further suggestions for prioritizing other mitigation types, including non-local off-site mitigation, and voluntary offsets issued by a recognized and reputable voluntary carbon registry. The CBSC regulations described above, with which the proposed project must comply, would be consistent with the intention of the 2022 Scoping Plan and the recommended actions included in Appendix D of the 2022 Scoping Plan.

With regard to transportation energy use, the proposed project would comply with all applicable regulations associated with vehicle efficiency and fuel economy. In addition, as discussed in Section XVII, Transportation, of this IS/MND, Mitigation Measure XVII-1 would require implementation of California Air Pollution Control Officers Association (CAPCOA) VMT reduction strategies T-23 and T-25, which would reduce the number of vehicle trips generated by the project and result in a less-than-significant impact to VMT. In addition, the project site is located within proximity to existing residential neighborhoods, bicycle infrastructure, and transit infrastructure. The site's access to public transit and proximity to bicycle and pedestrian facilities, such as existing sidewalks and bicycle lanes along Santa Teresa Boulevard and the new bicycle lanes and sidewalks to be built along Watsonville Road as part of the proposed project, would reduce VMT and, consequently, fuel consumption associated with the proposed single-family residences.

[16] California Air Resources Board. *2022 Scoping Plan for Achieving Carbon Neutrality.* November 16, 2022.

Conclusion

Based on the above, construction and operation of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Thus, a ***less-than-significant*** impact would occur.

VII. GEOLOGY AND SOILS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	✖	☐
ii. Strong seismic ground shaking?	☐	☐	✖	☐
iii. Seismic-related ground failure, including liquefaction?	☐	✖	☐	☐
iv. Landslides?	☐	✖	☐	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	✖	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	✖	☐	☐
d. Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	✖	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	✖
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	✖	☐

Discussion

ai-ii. According to the City of Morgan Hill General Plan EIR, major faults located in the project area include the Calaveras Fault located approximately 4.1 miles northeast of the City, the San Andreas Fault located approximately five miles southwest of the City, and the Sargent Fault located approximately three miles west of the City. Given that known surface expressions of fault traces do not exist within the City of Morgan Hill, including the site, fault rupture hazard is not a significant geologic hazard at the site. In addition, Alquist-Priolo Earthquake Fault Zones are not delineated within or near the project site.[17]

Due to the proximity of the site to nearby active faults, strong ground shaking could occur at the site as a result of an earthquake on any one of the faults. However, the proposed project would be subject to all applicable regulations within the CBSC and Chapter 15.08 (Building Code) of the City's Municipal Code, which provide standards to protect property and public safety by regulating the design and construction of foundations, building frames, and other building elements. Therefore, a ***less than significant*** impact would occur related to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault or strong seismic ground shaking.

[17] California Department of Conservation. *Earthquake Zones of Required Investigation.* Available at: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed June 2024.

aiii,aiv, c,d. The proposed project's potential effects related to liquefaction, landslides, lateral spreading, and subsidence/settlement are discussed in detail below.

Liquefaction and Subsidence/Settlement

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. Because saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths. Additionally, loose unsaturated sandy soils have the potential to settle during strong seismic shaking. Liquefaction can often result in subsidence, which refers to the gradual settling or sudden sinking of land surface, or settlement, which refers to the vertical movement of soil when a load is applied to the surface.

According to the ABAG Resilience Program's interactive Hazards Map, the project site is located in a high earthquake liquefaction susceptibility zone.[18] The Geologic Hazard Evaluation and Soil Engineering Study (Geologic Hazard Evaluation) prepared by Earth Systems Pacific for the project site (see Appendix E)[19] included seven exploratory borings (B1 through B7) taken at depths of 15 to 32 feet below ground surface (bgs). Borings B2 through B6 generally encountered four to 12 feet consisting of brown to dark brown, very stiff to hard, sandy lean clay overlying granular soil layers. Below the clay was medium dense to dense, clayey sands and gravel-sand-clay mixtures to depths of 32 bgs. However, in Borings B3 and B4, loose to medium dense granular soils were encountered that are susceptible to liquefaction or dry sand subsidence. Boring B4 was located in the northernmost corner of the site; Boring B5 was located in the westernmost corner of the site; and Borings B2, B3, and B6 were centrally located on-site. Borings B1 and B7, which were located nearest to Llagas Creek, and drilled to depths of 25 and 31 feet, respectively, encountered shale at the bottom of the explored depths. Earth Systems Pacific also encountered groundwater during the borings between eight and 12 feet bgs. The Geologic Hazard Evaluation determined that the loose to medium dense coarse soils found in borings B3 and B4 would be susceptible to liquefaction and could result in approximately 0.5 inches of liquefaction-related settlement. Such liquefiable layers were not found uniformly throughout the site and liquefaction is not expected to occur throughout the site; however, liquefaction could occur in localized areas of the project site.

The Safety, Services, and Infrastructure Element of the General Plan acknowledges the hazards associated with seismically induced liquefaction in the planning area, and includes a number of policies (SSI-1.1, 1.2, 2.1, and 2.3) that are relevant to the potential hazards. The CBSC and Morgan Hill Building Code also provide standards to protect property and public safety by regulating the design and construction of excavations, foundations, building frames, retaining walls, and other building elements, which would further reduce the potential for seismic-related ground failure, including liquefaction. The proposed project would be required to comply with the aforementioned regulations. However, due to the potential for liquefaction to occur on-site, foundation subsidence or

[18] Association of Bay Area Governments. *Resilience Program.* Available at: https://mtc.maps.arcgis.com/apps/webappviewer/index.html?id=4a6f3f1259df42eab29b35dfcd086fc8. Accessed June 2024.

[19] Earth Systems Pacific. *Geologic Hazard Evaluation and Soil Engineering Study.* September 2012.

settlement may occur, and, without the implementation of mitigation, a significant impact could occur.

Landslides

Seismically-induced landslides are triggered by earthquake ground shaking. The risk of landslide hazard is greatest in areas with steep, unstable slopes. The topography of the project site is relatively flat with an elevation ranging from approximately 340 to 350 feet above mean sea level.[20] Thus, the proposed project would not be subject to substantial landslide risks.

Lateral Spreading

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As stated above, the project site is generally flat; however, the project site does include a portion of Llagas Creek, which is a free face. Borings B1 and B7 were taken in areas adjacent to Llagas Creek and indicated a low potential for liquefaction. Because the liquefiable soils found on the site in Boring B3 and B4 are not uniform throughout the site and both samples are located away from Llagas Creek, the potential for lateral spreading at the site is considered to be low.

Expansive Soils

Expansive soils can undergo significant volume changes with changes in moisture content. Specifically, such soils shrink and harden when dried and expand and soften when wetted. If structures are underlain by expansive soils, foundation systems must be capable of withstanding the potential damaging movements of the soil.

Pursuant to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, the project site is comprised of approximately 10 acres of Zamora clay loam, zero to two percent slopes (ZbA), 6.8 acres of Pleasanton loam, zero to two percent slopes (PoA), 1.6 acres of Riverwash (Rg), and 0.2 acres of Vallecitos rocky loam, 15 to 30 percent slopes (VaE2). PoA has a shrink-swell numerical rating ranging from 0.10 to 0.95, ZbA has a shrink-swell numerical rating of 0.50, and Rg and VaE2 have a shrink-swell numerical rating of 1.00.[21] The numerical ratings indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00). As such, PoA and ZbA are somewhat limited with regard to shrink-swell potential, which indicates that the soils have features that are moderately favorable for the construction of dwellings without basements. As listed in the Web Soil Survey, Rg and VaE2 have a very limited shrink-swell potential, which indicates that the soils have one or more features that are unfavorable for the construction of dwellings without basements. The soils classified as Rg and VaE2 are located within the Llagas Creek corridor, and development of the proposed project would be limited to the approximately 16.8-acre portion of the proposed project with soils consisting of either PoA or ZbA. Nonetheless, according to the Geologic Hazard Evaluation prepared for the project site, the on-site surficial soils have a Plasticity Index (PI) of 27, which indicates a moderately high expansion potential.

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[20] Weber, Hayes, & Associates. *Phase I Environmental Site Assessment, 14905 Santa Teresa Boulevard, Morgan Hill, CA.* August 28, 2023.

[21] U.S. Department of Agriculture. *Web Soil Survey.* Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed June 2024.

While the proposed project would be required to comply with the CBSC and all applicable construction standards provided in the Municipal Code to ensure the structural integrity of the proposed structures, because the shrink-swell numerical ratings for the on-site soils range from 0.10 to 1.00, the potential on-site expansive soils could adversely affect the proposed project.

Conclusion

Based on the above, the proposed project would not be subject to substantial risks related to landslides or lateral spreading. However, the potential exists for liquefaction and associated subsidence/settlement, or expansive soils to occur at the project site. Without implementation of mitigation, the proposed project could cause substantial adverse effects related to such. Thus, a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

VII-1. *Prior to approval of any grading permits, the project Civil Engineer shall show on the project plans that the project design adheres to all engineering recommendations provided in the site-specific Geologic Hazard Evaluation and Soil Engineering Study prepared for the proposed project by Earth Systems Pacific. Proof of compliance with all recommendations specified in the Geologic Hazard Evaluation and Soil Engineering Study shall be subject to review and approval by the City Engineer.*

The project plans shall include, but not be limited to, engineering recommendations related to site preparation and grading, utility trench excavation, backfill, foundations, concrete slab-on-grade floors, exterior concrete flatwork, pavement areas, and project review and construction monitoring.

The site demolition activities shall also specify that any trees; aboveground structures; and underground structures, such as abandoned utility and/or irrigation lines, septic tanks, and leach fields, encountered during demolition and construction shall be properly removed, all excavations left open for backfilling, and loose material created by the demolition of existing structures should be excavated and replaced as engineered fill.

b. Development of the proposed project site would cause ground disturbance of mostly topsoil related to construction activity. The ground disturbance would be limited to the areas proposed for grading and excavation, including building pads; curb, gutter, and sidewalk improvement areas; and drainage, sewer, and water infrastructure alignments. After grading and excavation and prior to overlaying the disturbed ground surfaces with impervious surfaces and structures, the potential exists for wind and water erosion to occur, which could adversely affect downstream storm drainage facilities.

As noted in Section X, Hydrology and Water Quality, of this IS/MND, stormwater runoff associated with the site would be required to comply with the City's Stormwater Management Program (SWMP) standards. As such, the project would not significantly increase stormwater flows into the existing system. The final drainage system design for

the project will be subject to review and approval by the City of Morgan Hill Engineering Land Development Division, who will confirm that the proposed drainage system for the project is consistent with the City's Storm Drainage Master Plan and standard stormwater-related conditions of approval. Therefore, the proposed project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or flooding on- or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.

Furthermore, new development within the City that disturbs one or more acres of land is required to comply with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit and prepare a Storm Water Pollution Prevention Plan (SWPPP) incorporating Best Management Practices (BMPs) to control sedimentation, erosion, and hazardous materials contamination of runoff during construction.

The proposed project would disturb approximately 18.54 acres and, thus, would be subject to such requirements. In addition, pursuant to Chapter 13.30 (Urban Storm Water Quality Management and Discharge Control) of the City's Municipal Code, a Sediment Control Plan and an Erosion Control Plan must be prepared for the proposed project. BMPs of the Erosion Control Plans would include preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, earth dikes and drainage swales, velocity dissipation, and slope drains. BMPs of the Sediment Control Plans would include drainage inlet protection, designation of a temporary construction entrance, as well as temporary fiber rolls and other BMPs to prevent pollution and erosion. In addition, the Sediment and Erosion Control Plans would be subject to review and approval by the City Engineer prior to the approval of improvement plans and the issuance of building permits to ensure that the plan complies with City standards.

Based on the above, the proposed project would not result in substantial soil erosion or the loss of topsoil. Based on the above, a ***less-than-significant*** impact would occur.

e. The proposed development would connect to existing City-maintained sewer infrastructure and would not include the use of septic tanks. Accordingly, ***no impact*** would occur related to soils incapable of adequately supporting the use of septic tanks.

f. Paleontological resources or fossils are the remains of prehistoric plant and animal life. As noted in the General Plan EIR, based on a review of the University of California's Museum of Paleontology's fossil locality database conducted for all of Santa Clara County, paleontological resources have not been identified within the City of Morgan Hill.[22] In addition, the project site has been subject to previous disturbance. Thus, paleontological resources are not expected to occur on the site. Furthermore, the proposed project would be subject to the City's standard measures listed in Section V, Cultural Resources, of this IS/MND. As noted in the General Plan EIR, such measures would ensure adverse impacts to paleontological resources are avoided.

As noted in the City's General Plan, occurrences of fossil resources are closely tied to the geologic units. The soil types at the project site are not considered unique geologic features and are common within the geographic area of the City. As such, development of the proposed project would not destroy a unique geologic feature. Therefore, the

[22] City of Morgan Hill. *Morgan Hill 2035 Draft Environmental Impact Report* [pg. 4.5-17]. January 2016.

proposed project would not result in the direct or indirect destruction of a unique paleontological resource or unique geological feature, and a ***less-than-significant*** impact would occur.

VIII. GREENHOUSE GAS EMISSIONS. *Would the project:*	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	✖	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	☐	☐	✖	☐

Discussion

a,b. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions. Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents ($MTCO_2e$/yr).

The proposed project is located within the jurisdictional boundaries of BAAQMD. The most recent BAAQMD Air Quality Guidelines were released in April 2023.[23] The updated GHG thresholds address more recent climate change legislation, including Senate Bill (SB) 32 and provide qualitative thresholds related to Buildings and Transportation.

Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Neither the City nor BAAQMD has an adopted threshold of significance for construction-related GHG emissions and does not require quantification. Nonetheless, the proposed project's construction GHG emissions, as well as operational emissions, have been estimated using CalEEMod under the same assumptions discussed in Section III, Air Quality, of this IS (see Appendix A). The emissions estimates prepared for the proposed project determined that unmitigated construction of the project would result in total GHG emissions of 621 $MTCO_2e$ over the entire construction period.

Potential impacts related to operational GHG emissions resulting from implementation of the proposed project are considered in comparison with BAAQMD's adopted thresholds of significance below.

[23] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.

BAAQMD Thresholds of Significance

The BAAQMD's adopted thresholds of significance for GHG emissions are qualitative, and address recent climate change legislation, including SB 32. According to the new thresholds of significance, a project must either include specific project design elements (e.g., exclude use of natural gas, achieve a specific reduction in project-generated VMT below the regional average) or be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).[24]

In December of 2021, the City of Morgan Hill adopted a Climate Action Plan (CAP);[25] however, the City's CAP does not qualify as a local GHG reduction strategy under CEQA Guidelines Section 15183.5(b). Therefore, the following analysis focuses on the new BAAQMD GHG thresholds related to specific project design elements.

According to the BAAQMD's thresholds of significance, in order to find a less-than-significant GHG impact, projects must include, at a minimum, the following project design elements:

1. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development);
2. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines;
3. The project will achieve a reduction in project-generated VMT below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted SB 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA; and
4. The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

In order to be consistent with the first criterion, the proposed project would be required to include all electric appliances and plumbing. The 2022 Building Energy Efficiency Standards requires that new development be built electric-ready (i.e., structures will be required to have electric supply panels and circuitry to support all-electric appliances and heating). According to project design, and as required by City Ordinance No. 2306, natural gas infrastructure would be prohibited in the proposed residences. Thus, the proposed project would be consistent with the first criterion.

Regarding the second criterion, as discussed in Section VI, Energy, of this IS/MND, the proposed project would comply with all applicable federal, State, and local regulations regarding energy use during both project construction and project operations. Therefore, as discussed therein, the proposed project would not result in any wasteful, inefficient, or unnecessary energy usage.

With respect to the third criterion, as discussed in Section XVII, Transportation, of this IS/MND, the City of Morgan Hill average home-based VMT per capita was calculated to be 24.64. Therefore, the impact threshold of 15 percent below the Citywide average home-

[24] Bay Area Air Quality Management District. *2022 California Environmental Quality Act Guidelines*. April 2023.
[25] City of Morgan Hill. *Morgan Hill 2021 Climate Action Plan*. December 15, 2021.

based VMT per capita equates to 20.94. The project is projected to generate a VMT per capita of 22.04, which is above the aforementioned impact threshold. However, Mitigation Measure XVII-1 would require implementation of CAPCOA VMT reduction strategies T-23 and T-25. Therefore, with implementation of Mitigation Measure XVII-1, the project would achieve a 15 percent reduction in project-generated VMT below the City/local average consistent with the current version of the California Climate Change Scoping Plan.

With respect to the fourth criterion, the proposed project would be subject to the single-family residential standards set forth in the CALGreen Code. Pursuant to the 2022 CALGreen Code, single-family residential projects are required to install a listed raceway to accommodate a dedicated 208/240-volt branch circuit for each unit, which would be suitable for EV charging. Compliance with the aforementioned CalGreen Code requirement would be sufficient to comply with the Tier 2 CALGreen standards, as required by BAAQMD.

As previously noted, the CARB prepared the 2022 Scoping Plan, which builds upon previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix D of the 2022 Scoping Plan provides suggestions for prioritizing various types of mitigation, such as on-site GHG-reducing design features and mitigation measures. Similar to the 2022 Scoping Plan, BAAQMD identified the necessary design elements required of new land use projects and plans being built today in order to achieve California's long-term climate goal of carbon neutrality by 2045. If these design elements are incorporated into the design and construction of a project, then the project would contribute its portion of what is necessary to achieve California's long-term climate goals— its "fair share"—and a lead agency reviewing the project under CEQA can conclude that the project would not make a cumulatively considerable contribution to global climate change.

Based on the above, BAAQMD's thresholds of significance are consistent with the 2022 Scoping Plan. Therefore, if a development project is consistent with BAAQMD's thresholds of significance, it can be assumed that the project would also be consistent with the 2022 Scoping Plan. As such, because the proposed project would be consistent with BAAQMD's required thresholds of significance, the proposed project would also be consistent with the 2022 Scoping Plan.

Conclusion

Based on the above, the proposed project would not be considered to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and a ***less-than-significant*** impact would occur.

IX. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	✖	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	☐	✖	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	✖
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	✖	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	✖
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	✖	☐
g. Expose people or structures, either directly or indirectly, to the risk of loss, injury or death involving wildland fires?	☐	☐	✖	☐

Discussion

a. A significant hazard to the public or the environment could result from the routine transport, use, or disposal of hazardous materials. Future operations of the proposed residences on the project site could involve the use of common household cleaning products, fertilizers, and herbicides on-site, any of which could contain potentially hazardous chemicals; however, such products would be expected to be used in accordance with label instructions. Due to the regulations governing use of such products and the amount that could reasonably be used on the site, routine use of such products would not represent a substantial risk to public health or the environment. Therefore, the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and a ***less-than-significant*** impact would occur.

b. A development project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment should a site contain potential Recognized Environmental Conditions (RECs) that are not properly addressed prior to project implementation. A REC indicates the presence or likely presence of any hazardous substances in, on, or at a property due to any release into the environment, under conditions indicative of a release to the environment, or under conditions that pose a material threat of a future release to the environment.[26] A Historical REC (HREC) is

[26] ASTM International. *ASTM E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.* 2013.

defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls.

The following discussion provides an analysis of potential hazards related to the proposed construction activities and the project's potential to exacerbate any existing on-site hazardous conditions.

Construction Activities

Construction activities associated with the proposed project would involve the use of heavy equipment, which would contain fuels and oils, and the use of other products such as concrete, paints, and adhesives. Small quantities of potentially toxic substances (e.g., petroleum and other chemicals used to operate and maintain construction equipment) would be used at the project site and transported to and from the site during construction. However, the project contractor would be required to comply with all California Health and Safety Codes and local City ordinances regulating the handling, storage, and transportation of hazardous and toxic materials. Thus, construction of the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.

Existing On-Site Hazardous Conditions

A discussion of potential on-site hazardous conditions related to contaminated soils, septic systems and/or wells, and hazardous building materials is discussed below. The analysis of existing on-site hazardous conditions is based on a Phase I Environmental Site Assessment (ESA) (see Appendix F) conducted by Weber, Hayes, & Associates (WHA).[27] The Phase I ESA included historical land use research, a review of regulatory records pertaining to on-site and vicinity properties, site reconnaissance, and interviews with persons knowledgeable about the project site. In addition, a Phase I ESA and Phase II Limited Soil, Soil Vapor and Groundwater Sampling Investigation (Phase I/II ESA) were completed by WHA (see Appendix G)[28] to evaluate potential environmental liabilities that may have resulted from long term agricultural operations at the property.

Contaminated Soils

According to the Phase I ESA, agency records identified an abandoned, 1,000-gallon gasoline underground storage tank (UST) which was removed from the project site in 1997. As part of the UST removal, a limited volume of impacted soils were removed to a depth of shallow groundwater, which was encountered at a depth of 14 feet bgs. Subsequent delineation investigations and two years of groundwater monitoring confirmed the gasoline release was very limited and attenuating over time. An old domestic well was properly destroyed as part of case closure activities. The characterization and cleanup of the fuel release was completed to the satisfaction of overseeing agency, and staff issued a "No Further Action," case closure letter in 2001.[29] The record of this agency-closed, fuel

[27] Weber, Hayes, & Associates. *Phase I Environmental Site Assessment, 14905 Santa Teresa Boulevard, Morgan Hill, CA.* August 28, 2023.
[28] Weber, Hayes, & Associates. *Phase I/II Environmental Site Assessment for an Agricultural Property, 14905 Santa Teresa Boulevard, Morgan Hill, CA.* September 10, 2013.
[29] *Ibid.*

release case is considered a HREC. Quarterly groundwater monitoring at the site was discontinued following SCVWD closure of the fuel leak case at the site.

In addition, agency records identified an abandoned 500-gallon gasoline aboveground storage tank (AST), which was emptied and no longer in service at the project site. A subsurface sampling investigation was performed in the vicinity of the AST on the property in 1997. Two test pits were excavated to determine if the surficial soil had been contaminated due to operation of the former AST. An area of soil with hydrocarbon odor was encountered in the second test pit; however, this test pit was extended down to shallow groundwater and all obviously contaminated soils, totaling 85 cubic yards, were removed.

The Phase I ESA also identified one former leaking UST (LUST) site located 550 feet northwest of the project site. The LUST was removed in 1989 and subsequent remediation was completed to address the aged diesel release. The site has been issued a case closure and due to its distance and location from the project site relative to the direction of groundwater flow, the Phase I ESA determined that the leak does not pose a risk to the project site. Therefore, future residents of the site would not be impacted by off-site contaminants related to the former LUST.

The project site has been historically used for agricultural activities, such as vineyards, since at least 1939. The project site is developed with the Barney Machado Barn, single-family residence, and detached garage. Past agricultural activities within the subject property may have included the use of pesticides and arsenic. In addition, building maintenance may have included the application of persistent pesticides (termiticides) around the foundation of former and existing structures to prevent pest invasions. Contaminated soils can leach toxic chemicals into nearby ground or surface waters, where these materials can be taken up by plants and animals, contaminate a human drinking water supply, or volatilize and contaminate the indoor air in overlying buildings.[30]

The Phase I/II ESA included an evaluation of any remaining elevated petroleum hydrocarbons associated with the agency-closed, former UST release, and a screening of shallow soil to check for the presence of persistent pesticides. During the shallow soil screening, concentrations of dieldrin, a chlorinated insecticide, were detected, but were less than the established California Human Health Screen Level (CHHL) of 0.035 mg/kg. In addition, trace detections of organochlorine pesticide dichlorodiphenyltrichloroethane (DDT) and its metabolites DDD, and DDE (DDx) were detected during the soil sample collection; however, the detections were below the Residential Environmental Screening Levels (ESLs) and CHHSLs for the compounds. Furthermore, while each of the samples had detections of naturally-occurring arsenic ranging from 2.9 to 3.9, such concentrations are within the range of naturally-occurring arsenic concentrations in the region, and are not the result of historical agricultural operations. Laboratory test results confirmed that impacts from either the former fuel release location or the agricultural fields were not significant. Based on the findings of soil sampling, WHA concluded that RECs were not located at the project site.

[30] U.S. Environmental Protection Agency. *Contaminated Land.* Available at: https://www.epa.gov/report-environment/contaminated-land. Accessed June 2024.

Septic Systems and/or Wells

According to the Phase I/II ESA, a septic system and associated drain field are located on-site and serve the existing single-family residence. Failing or older septic systems are likely to discharge untreated wastewater, which contain pathogens, nutrients, and other harmful substances directly into the groundwater or onto the ground and into surface waters.[31] Proper abandonment and removal of the septic system would be required prior to construction or a significant impact could occur.

According to the Phase I ESA, the active domestic well located in the southeast corner of the site, north of the existing residence, was installed in 1998 and currently provides drinking water to the residence. The domestic well would be decommissioned as part of the proposed project and would remain on-site. The second well, which is located south of the existing residence along Llagas Creek, is an inactive, cistern-type, water supply well. Wells carry the potential to be contaminated by both naturally occurring sources and by human activities, with contaminants potentially released into the environment through ground-disturbing construction activities in the event that on-site wells are disrupted.[32] According to the Phase I ESA, an "inactive" well is designated as "abandoned" when: 1) it has not been used in over a year, 2) it has not been maintained, and 3) there are no plans for future use. Abandoned water supply wells are considered an REC. Inactive and abandoned wells are required to be properly destroyed under a permit issued by the SCVWD prior to construction. According to the Phase I ESA, the property owner has reported that SCVWD is aware of the inactive cistern-type water supply well and the well will be destroyed as part of the proposed project following approval of a permit issued by the SCVWD. As such, the Phase I ESA determined that the existing wells are not considered RECs. However, without proper abandonment of the cistern-type water supply well, a significant impact could occur.

Hazardous Building Materials

Asbestos is the name for a group of naturally occurring silicate minerals that are considered to be "fibrous" and, through processing, can be separated into smaller and smaller fibers. The fibers are strong, durable, chemical resistant, and resistant to heat and fire. They are also long, thin, and flexible, such that they can be woven into cloth. Because of the above qualities, asbestos was considered an ideal product and has been used in thousands of consumer, industrial, maritime, automotive, scientific, and building products. However, later discoveries found that, when inhaled, the material caused serious illness.

For buildings constructed prior to 1980, the Code of Federal Regulations (29 CFR 1926.1101) states that all thermal system insulation (boiler insulation, pipe lagging, and related materials) and surface materials must be designated as "presumed asbestos-containing material" unless proven otherwise through sampling in accordance with the standards of the Asbestos Hazard Emergency Response Act. Because the existing on-site barn, single-family residence, and detached garage were constructed between 1883 and 1966, the potential exists that asbestos-containing materials were used in the construction of the structures. Thus, while the barn would remain on-site, the proposed project could potentially expose construction workers to asbestos during demolition of the single-family residence and detached garage, and a significant impact could occur.

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[31] U.S. Environmental Protection Agency. *Septic System Impacts on Water Sources.* Available at: https://www.epa.gov/septic/septic-system-impacts-water-sources. Accessed June 2024.

[32] Centers for Disease Control and Prevention. *Water Contamination and Diseases*. Available at: https://www.cdc.gov/healthywater/drinking/private/wells/diseases.html. Accessed June 2024.

Federal guidelines define lead-based paint (LBP) as any paint, varnish, stain, or other applied coating that has one milligram of lead per square centimeter or greater. Lead is a highly toxic material that may cause a range of serious illnesses, and in some cases death. In buildings constructed after 1978, the presence of LBP is unlikely. Structures built prior to 1978, and especially prior to the 1960s, are expected to contain LBP. Given that the existing structures on the property were constructed before the phase-out of LBPs in the 1970s, the proposed project could potentially expose construction workers to LBP during demolition of the structures. Thus, a significant impact could occur during demolition of the on-site structures.

Furthermore, caulk containing polychlorinated biphenyls (PCBs) were commonly used in building construction practices between 1950 and 1970 and, thus, may be present in the existing single-family residence in the southern portion of the site. Finally, the existing structures may include items that contain mercury, such as gas pressure regulators or thermostats. Therefore, demolition of the on-site single-family residence and detached garage could present a potential hazard risk related to LBP, asbestos, PCB-containing caulk, or mercury.

As part of the Phase I/II ESA, WHA collected temporary soil vapor and shallow soil samples and tested for asbestos and lead around the perimeter of the on-site structures. Asbestos was not detected in the samples; however, very limited traces of lead were detected in shallow soils around the perimeter of the buildings, which is typical residue of LBP chipping.

Conclusion

Based on the above, a potentially hazardous condition could exist if the existing septic system and inactive, cistern-type water supply well are not removed in accordance with County and State regulations. In addition, the potential exists for persistent pesticides and arsenic in on-site soils, asbestos-containing materials, LBPs, and PCB-containing caulk or mercury associated with the existing structures to occur. Therefore, without mitigation, the proposed project could create a significant hazard to the public or the environment, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impacts to a *less-than-significant* level.

IX-1. *Prior to issuance of a grading permit, the project applicant shall hire a licensed contractor to obtain the applicable abandonment permit from Santa Clara County Department of Environmental Health (SCCDEH) and the City of Morgan Hill, and properly abandon the on-site septic system for review and approval by the SCCDEH and the City of Morgan Hill Building Division.*

IX-2. *Prior to the issuance of a grading permit, a well permit shall be obtained from the Santa Clara Valley Water District (SCVWD) for the removal of the existing cistern-type water supply well. Following approval of the well permit, the well removal must be in accordance with County and State regulations and in cooperation with the SCVWD. Proof of compliance shall be submitted to the City of Morgan Hill Building Division.*

IX-3. *Prior to issuance of a demolition permit for any on-site structure, the Developer shall consult with certified Asbestos and/or Lead Risk Assessors to complete a visual inspection/pre-demolition survey, and possible sampling, to determine whether any structures to be demolished contain lead-based paint (LBP), asbestos, mercury, or polychlorinated biphenyl caulk. Sampling shall be conducted in accordance with the California Department of Toxic Substances Control's 2006 Interim Guidance Evaluation of School Sites with Potential Contamination from Lead based Paint, Termiticides, and Electrical Transformers. The report shall be submitted for review to the Building Department.*

If asbestos-containing materials or lead-containing materials are not discovered during the survey, further mitigation related to asbestos-containing materials or lead-containing materials shall not be required. If asbestos-containing materials and/or lead-containing materials are discovered by the survey, the project applicant shall prepare a work plan to demonstrate how all building materials containing LBP, asbestos, mercury, or polychlorinated biphenyl caulk shall be removed in accordance with current California Occupational Health and Safety Administration (Cal/OSHA) regulations and disposed of in accordance with all CalEPA regulations, prior to the demolition and/or removal of the on-site structures. The plan shall include the requirement that work shall be conducted by a Cal/OSHA registered asbestos and lead abatement contractor in accordance with Cal/OSHA Lead in Construction Standard Title 8, CCR 1529 and Title 8, CCR 1532.1 including employee training, employee air monitoring, and dust control.

If asbestos is found, all construction activities shall comply with all requirements and regulations promulgated through the National Emission Standards for Hazardous Air Pollutants (NESHAP). The demolition contractor shall be informed that all paint on the buildings shall be considered as containing lead and/or asbestos. The contractor shall follow all work practice standards set forth in the Asbestos National Emission Standards for Hazardous Air Pollutants (Asbestos NESHAP, 40 CFR, Part 61, Subpart M) regulations, as well as Section V, Chapter 3 of the OSHA Technical Manual. All potentially friable asbestos-containing materials shall be removed in accordance with NESHAP guidelines prior to any building demolition or renovation that may disturb the materials. A registered asbestos abatement contractor shall be retained to remove and dispose of asbestos-containing materials identified in the asbestos survey performed for the site in accordance with the standards stated above. The applicant shall submit the work plan to the City for review and approval. The City has the right to defer the work plan to the Santa Clara County Department of Environmental Health for additional review. Materials containing more than one (1) percent asbestos that is friable are also subject to BAAQMD regulations. Removal of materials containing more than one (1) percent friable asbestos shall be completed in accordance with BAAQMD Section 11-2-303.

c. The nearest school relative to the project site is ABC Montessori, which is located approximately 3,545 feet (0.67-mile) northeast of the site. In addition, residential developments do not typically include the use of or emission of hazardous materials. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school, and ***no impact*** would occur.

d. The California Environmental Protection Agency (Cal EPA) has compiled a list of data resources that provide information regarding the facilities or sites identified as meeting the "Cortese List" requirements, pursuant to Government Code 65962.5. The components of the Cortese List include the Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Site List,[33] the list of LUST sites from the State Water Resources Control Board (SWRCB's) GeoTracker database,[34] the list of solid waste disposal sites identified by the SWRCB, and the list of active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO) from the SWRCB.[35]

According to the Phase I ESA, the project site is listed in a number of regulatory databases and has a record of a fuel release, formerly maintaining an UST, and as a one-time generator of hazardous waste. The former Jones Christmas Tree Farm, which operated at the project site managed a 1,000-gallon gasoline UST and a 500-gallon gasoline AST. Both tanks were removed from the property in 1997, after which a release investigation and cleanup was conducted. As previously noted, quarterly groundwater monitoring at the site was discontinued following SCVWD closure of the fuel leak case at the site. SCVWD closure of the fuel leak investigation at the site was officially granted in a letter dated January 9, 2001.

The project site is not included on the DTSC Hazardous Waste and Substances Site List, or the list of solid waste disposal sites. Finally, the project site is not on the list of active CDO and CAO from the SWRCB. Therefore, the proposed project would not create a significant hazard to the public or the environment related to being located on a site which is included on a list of hazardous materials compiled pursuant to Government Code Section 65962.5, and a ***less-than-significant*** impact would occur.

e. The nearest airport to the project site is the San Martin Airport, which is located approximately 2.4 miles east of the project site at 13030 Murphy Avenue. The project site is located outside of the Airport Influence Area (AIA) identified in the San Martin Airport Comprehensive Land Use Plan.[36] In addition, the project site is not located within the vicinity of a private airstrip. Therefore, the project site is not located within two miles of any public airports and does not fall within an airport land use plan area. Accordingly, ***no impact*** would occur related to a safety hazard or excessive noise for people residing or working in the project area.

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[33] Department of Toxic Substances Control. *Hazardous Waste and Substances Site List (Cortese).* Available at: https://www.envirostor.dtsc.ca.gov/public/. Accessed June 2024.

[34] State Water Resources Control Board. *GeoTracker.* Available at: https://geotracker.waterboards.ca.gov/map/?myaddress=California&from=header&cqid=8858350455. Accessed June 2024.

[35] CalEPA. *Cortese List Data Resources*. Available at: https://calepa.ca.gov/sitecleanup/corteselist/. Accessed June 2024.

[36] Santa Clara County. *Comprehensive Land Use Plan, Santa Clara County, San Martin Airport.* Amended November 18, 2020.

f. During construction of the proposed project, all construction equipment would be staged on-site so as to prevent obstruction of local and regional travel routes in the City that could be used as evacuation routes during emergency events.

Emergency vehicle access would be provided by the new driveway off of Watsonville Road and the extension of Secretariat Way, which would connect to the internal roadway. The new internal circulation system would ensure that the proposed residences would not interfere with potential evacuation or response routes used by emergency response teams during operations.

The proposed project would also include off-site improvements to repave and reconfigure an approximately 14,600-sf segment of Watsonville Road, which is not located within the project boundaries, to include a left-turn lane, northbound lane, and a right-turn slip lane (see Figure 3). In addition, the proposed project would repave and restripe the portion of the Santa Teresa Boulevard/Watsonville Road intersection located north of the proposed project. The proposed project would also include a new eight-foot-wide meandering sidewalk along a 150-linear foot segment of Santa Terea Boulevard, which would connect to the new eight-foot-wide sidewalks along the eastern side of Watsonville Road. Furthermore, the proposed project would also include installation of two eight-foot-wide crosswalks across Watsonville Road and Santa Teresa Boulevard. The implementation of the off-site improvements could directly influence the transportation network near the site during construction, and could result in roadway or lane closures that adversely affect residents in the project area.

The proposed project is consistent with the site's current General Plan land use and zoning designations; thus, development of the site and associated effects on emergency evacuation routes has been anticipated by the General Plan and analyzed in the General Plan EIR. Therefore, the project would not conflict with the City's Emergency Operations Plan.[37]

Based on the above, the project would not substantially alter the existing circulation system in the surrounding area. Construction of the proposed project could temporarily impede access during off-site improvements; however, implementation of Mitigation Measure XVII-2 in Section XVII, Transportation, of this IS/MND requires implementation of a Traffic Control Plan, which would reduce construction related hazards. Therefore, the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, and a ***less-than-significant*** impact would occur.

g. The City's Wildland Urban Interface map indicates that the project site is not located in a High or Very High Fire Hazard Severity Zone (FHSZ).[38] In addition, the project site was planned for residential development and the site is bounded by residential development to the north, southeast, and west, as well as Llagas Creek along the southern boundary of the project site, which would serve as a fire break. The proposed project would also be required to comply with all applicable requirements of the California Fire Code (CFC), as adopted by Chapter 15.44 of the City's Municipal Code, including installation of fire sprinkler systems. Therefore, the proposed project would not expose people or structures

[37] City of Morgan Hill. *Emergency Operations Plan, Revision 2.5.* January 31, 2024.
[38] City of Morgan Hill. *City of Morgan Hill Wildland Urban Interface Map.* March 2009.

to the risk of loss, injury or death involving wildland fires, and a ***less-than-significant*** impact would occur.

X. HYDROLOGY AND WATER QUALITY. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	✖	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	✖	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site;	☐	☐	✖	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	✖	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	✖	☐
iv. Impede or redirect flood flows?	☐	☐	✖	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	✖	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	✖	☐

Discussion

a. The proposed project's potential to result in water quality impacts during construction and operations is discussed in further detail separately below.

Construction

Project construction activities such as grading, excavation, and trenching for site improvements would result in the disturbance of on-site soils. The exposed soils have the potential to affect water quality in two ways: 1) suspended soil particles and sediments transported through runoff; or 2) sediments transported as dust that eventually reach local water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites also have the potential to enter runoff. Typical pollutants include, but are not limited to, petroleum and heavy metals from equipment and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the sediment or contaminants should enter receiving waters in sufficient quantities. Impacts from construction-related activities would generally be short-term and of limited duration.

Water quality degradation is regulated by the federal NPDES Program, established by the Clean Water Act, which controls and reduces pollutants to water bodies from point and non-point discharges. In California, the NPDES permitting program is administered by the

SWRCB through nine Regional Water Quality Control Boards (RWQCBs). As discussed in Section VII, Geology and Soils, of this IS/MND, new development within the City that disturbs one or more acres of land is required to comply with the NPDES Construction General Permit and prepare a SWPPP incorporating BMPs to control sedimentation, erosion, and hazardous materials contamination of runoff during construction. The proposed project would disturb more than one acre and, thus, would be subject to the State NPDES Construction General Permit conditions.

The proposed project would also be subject to all regional and local water quality regulations. In order to meet water quality objectives for the region, the City of Morgan Hill, City of Gilroy, and County of Santa Clara have prepared and are implementing a Revised Regional SWMP.[39] The SWMP incorporates the efforts of the City of Morgan Hill, the City of Gilroy, and the unincorporated portion of Santa Clara County, within the watershed of the Pajaro River and Monterey Bay, to meet the Phase II Storm Water Permit requirements for small municipal separate storm sewer systems (MS4s).

The City of Morgan Hill implements the SWMP through an extensive program that entails: 1) the establishment of SWMP goals for the City; 2) public education and outreach; 3) public involvement and participation; 4) illicit discharge control; 5) construction site stormwater runoff control; 6) post-construction stormwater management in development; and 7) pollution prevention. For construction activities, the SWMP presents BMPs that are required for the control of stormwater runoff quality during construction. Compliance with the City's SWMP, as well as the NPDES General Construction Permit, would ensure that adverse impacts to water quality would not occur during construction.

Operation

After project construction, impervious surfaces on the project site could contribute incrementally to the degradation of downstream water quality during storm events. During the dry season, vehicles and other urban activities may release contaminants onto the impervious surfaces, where they would accumulate until the first storm event. During the initial storm event, or first flush, the concentrated pollutants would be transported via stormwater runoff from the site to the stormwater drainage system and eventually a downstream waterway.

The proposed project would be managed in accordance with Resolution R3-2013-0032 issued by the Central Coast RWQCB. This resolution formally adopts post-construction stormwater management requirements for development projects in the Central Coast Region. The requirements identify 10 Watershed Management Zones (WMZs) in the covered area, and specify stormwater management requirements for each zone, depending on the size of the development project. Because the proposed project site is located in an area classified as WMZ-1, stormwater management at the project site must include site design and runoff features to limit the amount of runoff from the project site as well as on-site water quality treatment to reduce pollutant loads in the stormwater runoff using a Low Impact Development (LID) treatment system such as biofiltration. In WMZ-1, the treatment system must retain 95 percent of the runoff from the project site and also maintain peak runoff flows such that they do not exceed pre-project flows.

[39] City of Morgan Hill. *Stormwater and Urban Runoff Management*. Available at: https://www.morganhill.ca.gov/490/Storm-Water-Management. Accessed July 2024.

A Stormwater Control Plan/Report (see Appendix H)[40] and Drainage Analysis and Stormwater Management Calculations (see Appendix I)[41] were prepared by MH Engineering Co. to assess the proposed project's compliance with the Central Coast RWQCB's Post-Construction Stormwater Compliance Resolution and the Stormwater Management Guidance Manual for LID & Post Construction Requirements. Development of the proposed project would include approximately 186,920 sf of impervious surfaces, which would alter the existing drainage pattern of the site. However, as detailed in the Stormwater Control Plan (see Figure 8), in order to manage and treat stormwater, the project site would be divided into 31 DMAs. DMAs one through 30 would include bio-swales, which would be provided along the side yards and backyards of each lot. Each lot would have a designated bio-swale treatment area. The bio-swales would detain excess runoff due to new development. Following treatment, stormwater would be released at less than or equal to pre-development levels in compliance with hydro-modification requirements for all storms up to the 100-year event. The stormwater would be released into inlets that connect to new storm drain lines and storm drain manholes throughout the new internal roadway system. The new storm drain lines and manholes would carry water off-site and deliver it into the existing 48-inch storm drain line located within Secretariat Way. The 48-inch storm drain line located within Secretariat Way would connect to an existing 60-inch public storm drain system, which is partially located within Secretariat Way and runs along the eastern boundary of the project site. The 60-inch public storm drain system ultimately drains to Llagas Creek. DMA 31 would be a self-treatment area.

In addition, pursuant to Chapter 18.140 (Post Construction Stormwater Pollution Prevention) of the City's Municipal Code, the proposed project would be subject to permanent storm water pollution prevention measures. As such, the proposed project would be required to comply with the design standards set forth in Section 18.140.040 (Design standards and selection of best management practices), and select and implement BMPs to the satisfaction of the City in accordance with the requirements contained in the most recent versions of the following documents:

1. City of Morgan Hill Stormwater Post Construction Best Management Practices Development Standards for new development and redevelopment;
2. California Storm Water Quality Association Best Management Practice Handbooks; and
3. City of Gilroy, City of Morgan Hill and County of Santa Clara Regional SWMP, as approved by the Central Coast Regional Water Quality Control Board.

The final design of the proposed drainage system would be reviewed and approved by the City of Morgan Hill Land Development Engineering Section, which would ensure that the proposed stormwater controls and drainage system complies with the City's Post Construction Stormwater Pollution Prevention Ordinance with respect to incorporating sufficient permanent stormwater control BMPs. Furthermore, the proposed drainage system would be required to undergo two annual inspections per year in perpetuity by a third-party Civil Engineer or a Qualified SWPPP Practitioner (QSP). Therefore, water quality standards or waste discharge requirements would not be violated, and water quality would not be degraded as a result of the proposed project operations.

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[40] MH Engineering Co. *Stormwater Control Plan for Blackrock – Quail Vineyard, Southerly Quadrant of Watsonville Road and Santa Teresa Boulevard Intersection, Morgan Hill, CA.* January 13, 2023.

[41] MH Engineering Co. *Drainage Analysis & Storm Water Management Calculations for Black Rock – 14 Single Family Detached APN's 779-02-023, Watsonville Road – Morgan Hill, CA.* Revised May 22, 2023.

Conclusion

Based on the above, impacts related to water quality would not occur during project construction or operations. Thus, the proposed project would not violate water quality standards/waste discharge requirements, or otherwise degrade water quality during construction and operation, and a ***less-than-significant*** impact would occur.

b,e. The City's water supplies currently consist entirely of groundwater. Approximately 25 percent of the City's supply is extracted from the Coyote Valley subarea of the Santa Clara Subbasin, and approximately 75 percent is extracted from the Llagas Subbasin. The project site is located within the Llagas Subbasin. Neither of the subbasins are in a condition of overdraft, and groundwater levels are not expected to drop.[42] It should be noted that water supply is further discussed in Section XIX, Utilities and Service Systems, of this IS/MND.

Groundwater within the Llagas Subbasin is managed by the SCVWD. The 2021 Groundwater Management Plan (GWMP), prepared pursuant to the Sustainable Groundwater Management Act of 2014, describes the SCVWD's comprehensive groundwater management framework, including existing and potential actions to achieve basin sustainability goals and ensure continued sustainable groundwater management. The GWMP covers the Santa Clara and Llagas subbasins, located entirely in Santa Clara County and identified by the Department of Water Resources (DWR) as Basins 2-9.02 and 3-3.01, respectively. DWR identified the Santa Clara and Llagas subbasins as high-priority based on criteria that include overlying population, projected growth, number of wells, irrigation acreage, groundwater reliance, and groundwater impacts. However, neither subbasin has been identified as being critically overdrafted.[43]

While the proposed project would include development of new impervious surfaces on the project site, as discussed under question 'a' above, on-site stormwater runoff from impervious surfaces would be collected within the on-site bio-swale areas. The bio-swales would use biofiltration media and special plant selection to break down contaminants in the water before entering the underground storage system. The excess runoff during the peak of the storm would be captured, detained, and conveyed through a 48-inch storm drain line which discharges into the existing 60-inch public storm drain system that flows to Llagas Creek.

Given that groundwater levels within the subbasin underlying the project site are currently stable, and that the proposed project would provide for opportunities for on-site recharge, the project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the Llagas Subbasin. In addition, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Thus, a ***less-than-significant*** impact would occur.

ci-iii. The project site is currently developed with a single-family residence, detached garage, and pool in the southeastern corner of the site, and the Barney Machado Barn is centrally located on-site. The site also contains one active domestic well and water tank within the southeast corner of the site, and one inactive cistern-type well is located within the

[42] City of Morgan Hill. *Morgan Hill 2035 Final Environmental Impact Report* [pg. 4.9-18]. Adopted July 2016.
[43] Santa Clara Valley Water District. *2021 Groundwater Management Plan, Santa Clara and Llagas Subbasins* [pg. ES-1]. November 2021.

southern portion of the site near Llagas Creek. The terminus of Secretariat Way extends into the northwest corner of the site and a segment of Llagas Creek crosses the southern portion of the site and runs north to south. Development of the proposed project would include approximately 186,920 sf of impervious surfaces, which would alter the existing drainage pattern of the site. However, as discussed above, on-site stormwater runoff from impervious surfaces would be collected within the on-site bio-swale areas. The bio-swale areas would be placed at the lowest point on site to conform to existing terrain and watersheds. Following water quality treatment, stormwater would be released at less than or equal to pre-development levels in compliance with hydro-modification requirements for all storms up to the 100-year event per the City of Morgan Hill Drainage Ordinance. The stormwater would be released into inlets that connect to new storm drain lines and storm drain manholes throughout the new internal roadway system. Retained runoff in the bio-swale areas would be infiltrated within 72 hours after a storm. The excess runoff during the peak of the storm would be captured, detained, and conveyed through a 48-inch storm drain line which discharges into the existing 60-inch public storm drain system that flows to Llagas Creek. In summary, the bio-swale areas would treat and retain runoff from the project site and also maintain peak runoff flows such that they do not exceed pre-project flows, in accordance with the stormwater management requirements adopted by Resolution R3-2013-0032.

The final drainage system design for the project would be subject to review and approval by the City of Morgan Hill Land Development Engineering Section, who would confirm that the proposed stormwater controls and drainage system for the project is consistent with the City's Storm Drainage Master Plan and standard stormwater-related conditions of approval. Therefore, the proposed project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or flooding on- or off-site, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff. Thus, a ***less-than-significant*** impact would occur.

civ. According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06085C0609H, the project site is primarily located within Zone D; however, the southeast portion of the project site, which contains Llagas Creek, is located within a Special Flood Hazard Area (SFHA) (Zone AE).[44] Llagas Creek is a classified as a Regulatory Floodway. Zone D is defined as an area with possible, but undetermined flood hazards and Zone AE is defined as an area with one percent annual chance of flooding and is also referred to as the base flood or 100-year floodplain. According to the FEMA FIRM Number 06085C0609H, the projected flood elevation at the project site is between 341 feet and 342.5 feet (North American Vertical Datum of 1988). All buildings pads would be established at 343.85 feet and would be at least one foot above the 100-year flood elevation. Furthermore, development of the proposed project would not occur within the Zone AE portion of the project site. Pursuant to the City's Floodplain Ordinance (Section 15.80.160 of the Morgan Hill Municipal Code), without a Letter of Map Revision (LOMR) from FEMA, development within a SFHA is required to be anchored, constructed with flood resistant materials and designed to minimize flood damage, and elevated to at least one foot above the base flood elevation (within Zone AE). Therefore, the proposed project would be consistent with this requirement because the project site would be raised at least one foot above the base flood elevation. Furthermore, the proposed development would maintain a setback of 100 feet from the top of Llagas Creek bank.

[44] Federal Emergency Management Agency. *National Flood Hazard Layer FIRMette.* Accessed June 2024.

Although the project site is located within a SFHA and a LOMR has not been approved for the project site, development of the proposed project would be located outside of the 100-year floodplain. Therefore, development of the project is not anticipated to alter the existing drainage pattern of the site or area in a manner which would impede or redirect flood flows, and a ***less-than-significant*** impact would occur.

d. A discussion of flood hazards can be found above, under question 'civ.' A seiche is defined as a wave generated by rapid displacement of water within a reservoir or lake, due to an earthquake that triggers land movement within the water body or land sliding into or beneath the water body. The project site is not located near a water body that is susceptible to seiche hazard. In addition, the distance to the nearest coastline does not subject the site to tsunami hazards.

The project site is, however, located within the dam failure inundation hazard zone for Elmer J. Chesbro Dam, as indicated within the dam failure inundation hazard maps.[45] The dams in Santa Clara County are managed by the SCVWD. The dams are inspected twice each year and are continuously monitored for seepage and settling and inspected immediately following significant earthquakes. To date, the SCVWD has not identified any issues with the Elmer J. Chesbro Dam during inspections.

Based on the above, the proposed project would not be exposed to substantial risks related to flooding as a result of the failure of a dam, tsunamis, or seiches. In addition, as discussed under question 'civ' above, the proposed project would not present significant impact within a 100-year floodplain. Therefore, the project would not result in a risk related to the release of pollutants due to project inundation flooding, tsunami, or seiche, and a ***less-than-significant*** impact would occur.

[45] Association of Bay Area Governments. *Dam Inundation Map Viewer.* Available at: https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2. Accessed June 2024.

XI. LAND USE AND PLANNING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	✖	☐
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	✖	☐

Discussion

a. A project risks dividing an established community if the project would introduce infrastructure or alter land use so as to change the land use conditions in the surrounding community or isolate an existing land use. The project site is currently developed with a residence, garage, pool, barn, two wells, and a water tank. Surrounding existing land uses include single-family residences to the northeast, across Santa Teresa Boulevard; Llagas Creek, a single-family residence, and oak trees to the southeast; single-family residences to the southwest; and a seasonal fruit stand, agricultural land, and single-family residences to the northwest, across Watsonville Road.

The proposed residential development would be compatible with the existing residential development northeast, northwest, southeast, and southwest of the site, across Santa Teresa Boulevard. The proposed sidewalk improvements along Watsonville Road would also increase pedestrian connectivity in the project area. Therefore, the proposed project would be a continuation of the surrounding development and would not isolate an existing land use. Furthermore, the City of Morgan Hill General Plan designates the project site as Residential Estate and the site is zoned RE-1 and RPD District. Thus, development of the site with residential uses was evaluated as part of the City's General Plan EIR and the proposed project is consistent with the General Plan land use designation. As such, the proposed project would not physically divide an established community and a ***less-than-significant*** impact would occur.

b. The proposed project is consistent with the General Plan land use designation of Residential Estate; therefore, residential development has been anticipated at the project site. As demonstrated throughout this IS/MND, the proposed project would not conflict with City policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect. For example, implementation of Mitigation Measures IV-1 through IV-3, require preconstruction surveys for southwestern pond turtle, Crotch's bumblebee, and nesting/migratory birds, as well as avoidance measures if such species are detected. Furthermore, Mitigation Measures IV-4 and IV-5 require tree replacement to address removal of Ordinance Sized Trees and payment of the Santa Clara Valley Habitat Plan per-acre fee. With implementation of such mitigation measures, the project would not conflict with any applicable policies, regulations, or ordinances related to the protection of biological resources. In addition, as discussed under Section XIII, Noise, of this IS/MND, the project would comply with the noise level thresholds established in the City's General Plan and the Municipal Code during construction or operation with implementation of Mitigation Measures XIII-1 and XIII-2.

Based on the above, the proposed project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and thus, a ***less-than-significant*** impact would occur.

XII. MINERAL RESOURCES. *Would the project:*		Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	✖
b.	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	✖

Discussion

a,b. The City's General Plan does not identify any regionally or locally important mineral resources within the City of Morgan Hill. Consequently, the proposed project would not result in the loss of a known mineral resource that would be of value to the region nor would the project result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Therefore, ***no impact*** to mineral resources would occur as a result of the proposed project.

XIII. NOISE. *Would the project result in:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	✖	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	✖	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	✖

Discussion

a. The following section is based primarily on a Noise Assessment Study (Appendix J) prepared by Edward L. Pack Associates, Inc. [46] for the proposed project and includes a discussion of noise standards and criteria applicable to various land uses, as well as potential traffic noise and non-transportation noise sources associated with the proposed project. The following terms are referenced in the sections below:

- Decibel (dB): A unit of sound energy intensity. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels. All references to dB in this section will be A-weighted unless noted otherwise.
- Day-Night Average Level (L_{dn}): The average sound level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours.
- Equivalent Sound Level (L_{eq}): The average sound level over a given time-period.

Sensitive Receptors

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are considered to be sensitive to noise because intrusive noise can be disruptive to such activities. Existing sensitive receptors near the project site include the single-family residences to the north, east, west, and south of the project site boundary. The nearest residence is located approximately 30 feet southwest of the site boundary. The closest receptor to where the off-site infrastructure improvements would occur along Santa Teresa Boulevard is located approximately 80 feet to the east of the off-site improvement areas. The closest receptor to where the off-site improvements would occur along Watsonville Road is located approximately 250 feet southeast of the off-site improvement areas.

[46] Edward L. Pack Associates, Inc. *Noise Assessment Study for the Planned "Quail Vineyards" Single-Family Development, Watsonville Road, Morgan Hill.* November 16, 2022.

Existing Noise Environment

The existing noise environment in the project area is primarily defined by traffic on Santa Teresa Boulevard, directly northeast of the project site, and Watsonville Road, directly northwest of the project site. To determine the existing noise environment at the project site, Edward L. Pack Associates conducted continuous (24-hour) noise level measurements at two locations from October 19 to 20, 2022. Location 1 was located approximately 69 feet from the centerline of Watsonville Road and Location 2 was located approximately 120 feet from the centerline of Santa Teresa Boulevard. The noise measurement locations are shown on Figure 10. The results of the noise level measurements at Location 1 indicated that the existing noise level ranged from 56.8 to 63.8 dBA L_{eq} during the daytime and from 48.0 to 61.2 dBA L_{eq} at night. The results of the noise level measurements at Location 2 indicated that the existing noise level ranged from 51.4 to 58.7 dBA L_{eq} during the daytime and from 39.3 to 56.9 dBA L_{eq} at night. Based on the Noise Assessment Study measurements, the existing noise level along Watsonville Road at the project site is 63 dBA L_{dn} and the existing noise level along Santa Teresa Boulevard at the project site is 58 dBA L_{dn}.

City Noise Standards and Criteria

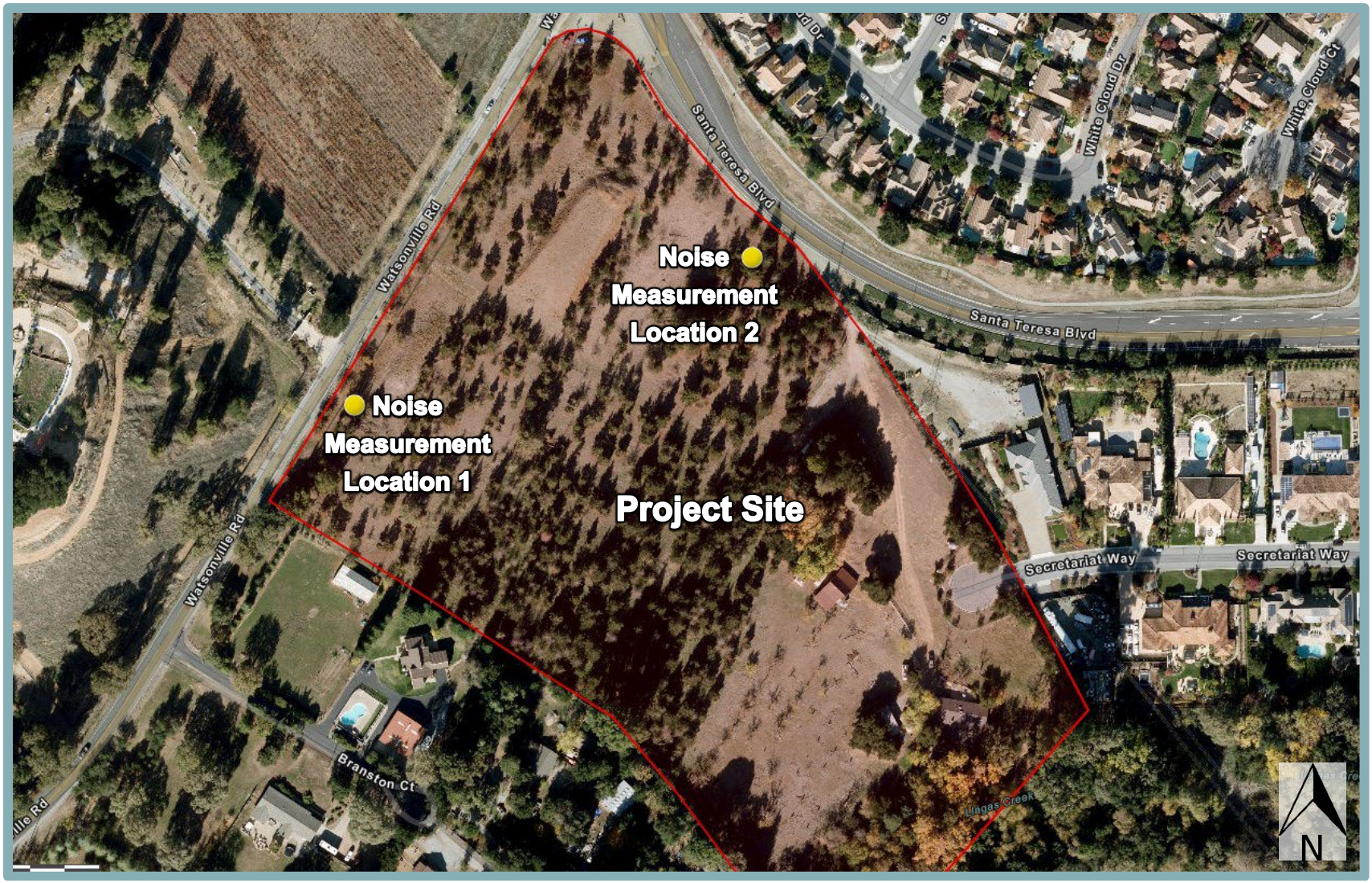
Chapter 9, Safety, Service, and Infrastructure, of the City's General Plan contains the following noise policies that would be applicable to the proposed project:

SSI-8.1 Exterior Noise Level Standards. Require new development projects to be designed and constructed to meet acceptable exterior noise level standards (see Table SSI-1 [of the General Plan]), as follows:

- Apply a maximum exterior noise level of 60 dBA L_{dn} in residential areas where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreation areas in multi-family housing projects). Where the City determines that providing an L_{dn} of 60 dBA or lower cannot be achieved after the application of reasonable and feasible mitigation, an L_{dn} of 65 dBA may be permitted.
- Indoor noise levels should not exceed an L_{dn} of 45 dBA in new residential housing units.
- Noise levels in new residential development exposed to an exterior L_{dn} 60 dBA or greater should be limited to a maximum instantaneous noise level (e.g., trucks on busy streets, train warning whistles) in bedrooms of 50 dBA. Maximum instantaneous noise levels in all other habitable rooms should not exceed 55 dBA. The maximum outdoor noise level for new residences near the railroad shall be 70 dBA L_{dn}, recognizing that train noise is characterized by relatively few loud events.

SSI-8.2 Impact Evaluation. The impact of a proposed development project on existing land uses should be evaluated in terms of the potential for adverse community response based on significant increase in existing noise levels, regardless of compatibility guidelines.

Figure 10
Noise Measurement Locations



SSI-8.5 Traffic Noise Level Standards. Consider noise level increases resulting from traffic associated with new projects significant if: a) the noise level increase is 5 dBA L_{dn} or greater, with a future noise level of less than 60 dBA L_{dn}, or b) the noise level increase is 3 dBA L_{dn} or greater, with a future noise level of 60 dBA L_{dn} or greater.

SSI-8.6 Stationary Noise Level Standards. Consider noise levels produced by stationary noise sources associated with new projects significant if they substantially exceed existing ambient noise levels.

SSI-8.7 Other Noise Sources. Consider noise levels produced by other noise sources (such as ballfields) significant if an acoustical study demonstrates they would substantially exceed ambient noise levels.

SSI-8.9 Site Planning and Design. Require attention to site planning and design techniques other than sound walls to reduce noise impacts, including: a) installing earth berms, b) increasing the distance between the noise source and the receiver, c) using non-sensitive structures such as parking lots, utility areas, and garages to shield noise-sensitive areas, d) orienting buildings to shield outdoor spaces from the noise source, and e) minimizing the noise at its source.

In addition to the policies listed above, Section 18.76.090 (Noise) of the City's Municipal Code contains maximum noise levels for non-transportation noise sources. The City's quantitative exterior noise standards are reproduced below in Table 4. Importantly, this section of the Code states that noise standards in the below table (i.e., Table 18.76-1 of the Code) do not apply to noise generated by vehicle traffic in the public ROW or from temporary construction, demolition, and vehicles that enter and leave the site of the noise-generating use (e.g., construction equipment, trains, trucks).

Table 4
Noise Level Performance Standards

Receiving Land Use	Maximum Noise Level at Lot Line of Receiving Use
Industrial and Wholesale	70 dBA
Commercial	65 dBA
Residential or Public/Quasi Public	60 dBA

Notes:
- The planning commission may allow an additional 5 dBA noise level at the lot line if the maximum noise level shown above cannot be achieved with reasonable and feasible mitigation.
- Noise standards shown above do not apply to noise generated by vehicle traffic in the public ROW or from temporary construction, demolition, and vehicles that enter or leave the site of the noise-generating use (e.g., construction equipment, trains, trucks).

Source: City of Morgan Hill Municipal Code.

Furthermore, Section 8.28.040.D of the Morgan Hill Municipal Code, limits construction activity noise as follows:

> "Construction activities" are defined as including but not limited to excavation, grading, paving, demolition, construction, alteration or repair of any building, site, street or highway, delivery or removal of construction material to a site, or movement of construction materials on a site. Construction activities are prohibited other than between the hours of

seven a.m. and eight p.m., Monday through Friday and between the hours of nine a.m. to six p.m. on Saturday. Construction activities may not occur on Sundays or federal holidays. No third person, including but not limited to landowners, construction company owners, contractors, subcontractors, or employers, shall permit or allow any person working on construction activities which are under their ownership, control or direction to violate this provision.

Construction activities may occur in the following cases without violation of this provision:

a. In the event of urgent necessity in the interests of the public health and safety, and then only with a permit from the Chief Building Official, which permit may be granted for a period of not to exceed three days or less while the emergency continues, and which permit may be renewed for periods of three days or less while the emergency continues.

b. If the Chief Building Official determines that the public health and safety will not be impaired by the construction activities between the hours of eight p.m. and seven a.m., and that loss or inconvenience would result to any party in interest, the Chief Building Official may grant permission for such work to be done between the hours of eight p.m. and seven a.m. upon an application being made at the time the permit for the work is issued or during the progress of the work.

c. The City Council finds that construction by the resident of a single residence does not have the same magnitude or frequency of noise impacts as a larger construction project. Therefore, the resident of a single residence may perform construction activities on that home during the hours in this subsection, as well as on Sundays and federal holidays from nine a.m. to six p.m., provided that such activities are limited to the improvement or maintenance undertaken by the resident on a personal basis.

d. Public Work projects are exempt from this section and the Public Works Director shall determine the hours of construction for public works projects.

Project Construction Noise

During construction of the proposed project, heavy-duty equipment would be used for demolition, grading, excavation, paving, and building construction, which would result in temporary noise level increases while in operation. Noise levels would vary depending on the type of equipment used, how the equipment is operated, and how well the equipment is maintained. In addition, noise exposure at any single point outside the project site would vary depending on the proximity of construction activities to that point. Standard construction equipment, such as graders, backhoes, loaders, and haul trucks would be used on-site.

Table 5 shows maximum noise levels associated with typical construction equipment.

Table 5
Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006.

Based on the table, activities involved in typical construction would generate maximum noise levels up to 90 dB at a distance of 50 feet. As one increases the distance between equipment, or increases separation of areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of combining separate noise sources. The noise levels from a source decrease at a rate of approximately 6 dB per every doubling of distance from the noise source.

As previously discussed, the nearest noise-sensitive receptor is located approximately 30 feet from the project site boundary. In addition, the closest receptor to where the off-site infrastructure improvements would occur along Santa Teresa Boulevard and Watsonville Road is located approximately 80 feet to the east and 250 feet southeast of the off-site improvement areas, respectively. Thus, construction associated with off-site roadway improvements would not be anticipated to generate noise levels exceeding Table 5 noise levels at nearby noise-sensitive receptors. However, construction activities associated with the proposed project within the site boundary could generate noise levels exceeding Table 5 noise levels at nearby noise-sensitive receptors.
However, as noted in Section 18.76.090 of the City's Municipal Code, the noise level performance standards set forth therein do not apply to noise generated by construction activities. Additionally, Chapter 8.28 of the Morgan Hill Municipal Code prohibits construction activities between 8:00 PM and 7:00 AM, Monday through Friday, and between 6:00 PM and 9:00 AM on Saturdays. Construction activities may not occur on Sundays or federal holidays.

Enforcement of time restrictions specified in the Morgan Hill Noise Ordinance and the use of noise-dampened equipment would be required to ensure that the temporary or periodic increase in ambient noise levels in the project vicinity associated with construction of the proposed project would not be considered substantial.

Project Operational Noise

The primary noise source associated with operation of the proposed project would be traffic noise. Pursuant to General Plan Policy SSI-8.5, noise level increases resulting from traffic associated with new projects are considered significant if: a) the noise level increase is 5 dBA L_{dn} or greater, with a future noise level of less than 60 dB L_{dn}, or b) the noise level increase is 3 dB L_{dn} or greater, with a future noise level of 60 dB L_{dn} or greater. As discussed above, the existing noise level along Watsonville Road at the project site is 63 dBA L_{dn} and the existing noise level along Santa Teresa Boulevard at the project site is

58 dBA L_{dn}. Therefore, for the purposes of this analysis, an increase of greater than 3 dBA above existing noise levels would be considered a substantial permanent increase in ambient noise levels.

Typically, a doubling of the Average Daily Traffic (ADT) hourly volumes on a roadway segment is required in order to result in an increase of 3 dBA in traffic noise levels, which is the lowest change that can be perceptible to the human ear in outdoor environments. Based on the trip generation from the CalEEMod modeling results, which relied upon the Institute of Transportation Engineer's Trip Generation Handbook 10th Edition, the proposed project would generate approximately 133 new daily trips (14 dwelling units X 9.44 weekday trips per unit). Therefore, the proposed project would not double the hourly or daily traffic volumes on any access roadway to the project site. As such, the increase in traffic noise resulting from project operations would be an increase of less than 3 dBA and would not be perceptible along any roadway segment in the project vicinity. Therefore, traffic-related noise levels generated as part of project operation would not result in a substantial permanent increase in traffic noise levels in the project vicinity in excess of standards established in the Morgan Hill General Plan.

Non-transportation noise-generating operations associated with the proposed project would primarily consist of landscaping maintenance and HVAC equipment. The landscaping maintenance and HVAC systems would be typical of the residential uses. Assuming the project HVAC systems and maintenance equipment would be in normal working order, such stationary noise sources associated with the proposed project would not substantially increase noise levels from what currently exists in the project area.

Conclusion

Based on the above, operation of the proposed project would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City's General Plan and the Municipal Code. However, considering the potential for construction activities to conflict with standards established by Section 8.28.040 (Enumeration of unlawful noises) of the City's Municipal Code, the proposed project could result in a ***potentially significant*** impact related to temporary increases in ambient noise levels in the project area.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above potential impact to a *less-than-significant* level.

XIII-1. *Noise-generating construction activities associated with the proposed project shall only occur within the hours identified in Municipal Code Section 8.28.040(D). The above language shall be included on final project improvement plans prior to issuance of a grading permit by the City of Morgan Hill Development Services Department.*

XIII-2. *The following measures shall be implemented during project construction:*

- *All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition;*

- *All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, State, or local agency shall comply with such regulations while in the course of project construction;*
- *Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible;*
- *Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors;*
- *Project area and site access road speed limits shall be established and enforced during the construction period; and*
- *Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.*

The above requirements shall be included via notation on project grading plans, subject to review and approval by the Development Services Department prior to issuance of a grading permit.

b. Similar to noise, vibration involves a source, a transmission path, and a receiver. However, noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration depends on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration is measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocities (PPV) in inches per second (in/sec). Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of PPV. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 6, which was developed by Caltrans, shows the vibration levels that would normally be required to result in damage to structures. As shown in the table, the threshold for architectural damage to structures is 0.20 in/sec PPV, and continuous vibrations of 0.10 in/sec PPV, or greater, would likely cause annoyance to sensitive receptors.

The primary vibration-generating activities associated with the proposed project would occur during demolition, grading, paving, placement of utilities, and construction of foundations. Table 7 shows the typical vibration levels produced by construction equipment at various distances. As shown in Table 7, the most substantial source of groundborne vibrations associated with project construction would be the use of vibratory compactors. Use of vibratory compactors/rollers could potentially be required during construction of the proposed drive aisles.

Based on Table 6, construction vibration levels anticipated for the project would be less than the 0.2 in/sec threshold at distances of 26 feet or more. Sensitive receptors that could be impacted by construction-related vibrations, especially vibratory compactors/rollers, are located approximately 30 feet, or further, from the site boundaries.

Furthermore, the proposed project would only cause elevated vibration levels during construction, as the proposed project would not involve any uses or operations that would generate substantial groundborne vibration. Additionally, construction activities would be temporary in nature and are required to occur during normal daytime working hours, consistent with Chapter 8.28 of the Morgan Hill Municipal Code, as required by Mitigation Measure XIII-1 in this IS/MND.

Table 6
Effects of Vibration on People and Buildings

PPV		Human Reaction	Effect on Buildings
mm/sec	in/sec		
0.15 to 0.30	0.006 to 0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling – houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10 to 15	0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans. Transportation Related Earthborne Vibrations. TAV-02-01-R9601. February 20, 2002.

Table 7
Vibration Levels for Various Construction Equipment

Type of Equipment	PPV at 25 feet (in/sec)	PPV at 50 feet (in/sec)
Large Bulldozer	0.089	0.029
Loaded Trucks	0.076	0.025
Small Bulldozer	0.003	0.000
Auger/drill Rigs	0.089	0.029
Jackhammer	0.035	0.011
Vibratory Hammer	0.070	0.023
Vibratory Compactor/roller	0.210	0.070

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006.

Based on the above, project operation would not include uses that would involve elevated vibration levels, and project construction would not generate excessive groundborne vibration or groundborne noise levels at the nearest existing sensitive receptors. Therefore, the project would result in a ***less-than-significant*** impact.

c. The nearest airport to the project site is the San Martin Airport, which is located approximately 2.4 miles east of the project site. The project site is located well outside of the AIA identified in the San Martin Airport Comprehensive Land Use Plan.[47] In addition, the project site is not located within the vicinity of a private airstrip. Therefore, the proposed project would not expose people residing or working in the project area to excessive noise levels associated with air traffic, and ***no impact*** would occur.

[47] Santa Clara County. *Comprehensive Land Use Plan, Santa Clara County, San Martin Airport.* Amended November 18, 2020.

XIV. POPULATION AND HOUSING. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	☐	☐	✖	☐
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	✖	☐

Discussion

a. The 2035 General Plan planned for residential development to be constructed on the project site pursuant to the site's General Plan land use designation of Residential Estate. Using a persons per household rate of 3.07 as estimated by the 2020 U.S. Census for the City of Morgan Hill, the proposed project could be expected to house approximately 43 (14 x 3.07 = 42.98) residents. [48] The 2020 U.S. Census estimated the population of Morgan Hill to be approximately 44,478.[49] Assuming all future residents of the proposed project would be new to the City, an increase in population of 43 residents would constitute an approximately 0.01 percent increase in the City's population, which is not considered substantial growth.

Population growth itself does not constitute an environmental impact; rather, increased demands on the physical environment resulting from increases in population are considered environmental impacts. For example, increased demands on City services could require system upgrades, the construction of which could have environmental impacts. Physical environmental effects associated with development of the proposed project are evaluated throughout this IS/MND. Furthermore, as discussed in Section XV, Public Services, of this IS/MND, the project site is located in an urban area and is surrounded by existing development. Therefore, construction of new or expanded public services facilities would not be necessary to serve the proposed project. As discussed in Section XIX, Utilities and Service Systems, of this IS/MND, adequate utility infrastructure would be available to support the proposed project and the proposed project would not include construction of new off-site utility infrastructure or expansion of existing utilities.

While the proposed project would result in population growth, such growth could be accommodated by existing public services and infrastructure and would not result in significant adverse environmental effects. Thus, a ***less-than-significant*** impact would occur related to inducing substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure).

b. The proposed project would require the removal of the existing on-site residence, garage, and pool. However, the removal of the structures would not be considered to result in the displacement of a substantial number of existing people or housing. In addition, although one residence would be removed from the City's housing stock, the proposed project would involve the construction of 14 new residences in the future. As such, the proposed project would not displace substantial numbers of existing people or housing,

[48] U.S. Census Bureau. *Quick Facts, City of Morgan Hill, California.* Available at: https://www.census.gov/quickfacts/fact/table/morganhillcitycalifornia,US/PST045223. Accessed June 2024.
[49] *Ibid.*

necessitating the construction of replacement housing elsewhere, and a ***less-than-significant*** impact would occur.

XV. PUBLIC SERVICES. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	☐	☐	✖	☐
b. Police protection?	☐	☐	✖	☐
c. Schools?	☐	☐	✖	☐
d. Parks?	☐	☐	✖	☐
e. Other Public Facilities?	☐	☐	✖	☐

Discussion

a-c,e. As the proposed project is consistent with the General Plan, buildout of the project site with residential uses has been evaluated in the City's General Plan EIR and anticipated in the City's planning efforts. Thus, the associated increase in demand for public services, such as police and fire prevention services, has already been anticipated and planned for by the City.

The City of Morgan Hill contracts with the California Department of Forestry and Fire Protection (CAL FIRE) for fire protection services. The nearest fire station to the project is Station #11, which is located at 15670 Monterey Road and is approximately 1.21 miles northeast of the project site. Although the City has not adopted response time standards or goals related to fire suppression, CAL FIRE is held to a seven minute, 59 second response time standard based on the 911 Emergency Medical Services Provider Agreement between the City of Morgan Hill and the County of Santa Clara Emergency Medical Services Agency.[50] The incremental increase in demand for fire protection associated with the proposed project would not necessitate new or physically altered fire protection facilities and would not be substantial enough such that the current response times could not be maintained.

The project site is located within the Morgan Hill Police Department's normal patrol routes, and, thus, police response times would be comparable to nearby existing developments. Furthermore, the project would introduce approximately 43 additional residents (14 units x 3.07 persons per household = 42.98 residents) in the City of Morgan Hill. As such, the incremental increase in demand for police and fire protection associated with the proposed project would not necessitate new or physically altered protection facilities and would not be substantial enough such that the current response times could not be maintained. In addition, pursuant to Municipal Code 3.56.030, the project applicant would be subject to development impact fees which would finance the cost of public facilities and improvements, including public safety facilities, required by new development.

The Morgan Hill Unified School District (MHUSD) operates public education facilities that serve the project site and surrounding area. The City of Morgan Hill is served by eight elementary schools, two middle schools, two high schools, one continuation school, one K-8 home school program, and one community adult school. Utilizing the MHUSD student yield rate of 0.465 students per household, the total anticipated development potential for

[50] Dwight Good, Assistant Chief Cooperative Fire Protection, Morgan Hill Fire Department. Personal communication [phone] with Nick Pappani, Vice President, Raney Planning and Management, Inc. June 1, 2021.

the project site (14 residential units) could add approximately seven new students to MHUSD schools.

The City collects development impact fees to help pay for public services including public schools. Proposition 1A/SB 50 prohibits local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "legislative or adjudicative act involving the planning, use, or development of real property." (Government Code 65996(b).) Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation." Therefore, according to SB 50, the payment of the necessary school impact fees for the project would be full and satisfactory CEQA mitigation.

With regard to other public facilities, such as libraries, given the relatively small number of units included in the proposed project, the project would not be anticipated to result in a substantial increase in demand for library services, or other public facilities, such that expanded facilities would be required. Future residents of the proposed project would have access to the Morgan Hill Library, which is operated by the Santa Clara County Library District, and is located approximately 2.3 miles northwest of the project site. In addition, the General Plan EIR concluded that buildout of the City, including the project site, would have a less-than-significant impact related to libraries, and other public facilities.

Based on the above, the project would have a ***less-than-significant*** impact with respect to creating adverse physical environmental impacts associated with the provision of new or physically altered governmental facilities in order to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, and other public facilities.

d. The proposed project is anticipated to generate an estimated 43 additional residents (14 units X 3.07 persons per household = 42.98 residents) in the City of Morgan Hill. As required by Section 3.56.030 of the Morgan Hill Municipal Code, the City collects park impact fees to offset the demand for neighborhood parkland created by new housing developments.

The City of Morgan Hill has adopted a Land Dedications and Reservations Ordinance (Municipal Code Chapter 17.28) that requires residential developers to dedicate public parkland or pay in-lieu fees, or both, to offset the demand for neighborhood parkland created by their housing developments. If a project site is not located in whole or in part of a recreational facility designated in the City's Bikeways, Trails, Parks and Recreation Master Plan, Section 17.28.060 of the Municipal Code requires project applicants to pay a fee equal to the value of the land prescribed for dedication. Because the project site is not located within a recreational facility identified in the Master Plan, the project is not proposing to dedicate any land to the City for recreational facilities. The project applicant would pay in-lieu fees required per the Municipal Code. The park impact fees imposed by the City will generate revenue to acquire necessary land to develop new parks or rehabilitate existing neighborhood parks and recreation facilities reasonably related to serve the subdivision.

Given that the proposed project would be required to pay the applicable park in-lieu fee, and that development of the site was anticipated by the City, the project would result in a ***less-than-significant*** impact related to parks and other public facilities.

XVI. RECREATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	✖	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	✖	☐

Discussion

a,b. As discussed in Section XIV, Population and Housing, of this IS/MND, the proposed project would involve the development of 14 single-family residences, which are anticipated to serve approximately 43 residents. Given the City's parkland goal of five acres per 1,000 residents, the proposed project would create the need for a minor amount of additional parkland (0.22 acres). The City of Morgan Hill has adopted a Land Dedications and Reservations Ordinance (Municipal Code Chapter 17.28) that requires residential developers to dedicate public parkland or pay in-lieu fees, or both, to offset the demand for neighborhood parkland created by their housing developments. If a project site is not located in whole or in part of a recreational facility designated in the City's Bikeways, Trails, Parks and Recreation Master Plan, Section 17.28.060 of the Municipal Code requires project applicants to pay a fee equal to the value of the land prescribed for dedication. The project is not located in whole or in part of a recreational facility identified in the Master Plan; therefore, the project is not proposing to dedicate any land to the City for recreational facilities. The project applicant would pay in-lieu fees required per the Municipal Code. The park impact fees imposed by the City will generate revenue to acquire necessary land to develop new parks or rehabilitate existing neighborhood parks and recreation facilities reasonably related to serve the subdivision. Based on the above, a ***less-than-significant*** impact would occur with regard to recreational resources.

XVII. TRANSPORTATION. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	✖	☐
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	✖	☐	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	✖	☐	☐
d. Result in inadequate emergency access?	☐	✖	☐	☐

Discussion

a. The law has changed with respect to how transportation-related impacts may be addressed under CEQA. Traditionally, lead agencies used level of service (LOS) to assess the significance of such impacts, with greater levels of congestion considered to be more significant than lesser levels. Enacted as part of SB 743 (2013), PRC Section 21099, subdivision (b)(1), directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Secretary of the Natural Resources Agency for certification and adoption proposed CEQA Guidelines addressing "criteria for determining the significance of transportation impacts of projects within transit priority areas. Those criteria shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses."

Pursuant to SB 743, the Natural Resources Agency promulgated CEQA Guidelines Section 15064.3 in late 2018. It became effective in early 2019. Subdivision (a) of that section provides that "[g]enerally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact."

Please refer to question 'b' for a discussion of VMT.

Pedestrian, Bicycle, and Transit Facilities

Pedestrian facilities are provided along the southeast boundary of Sunnyside Avenue, northwest boundary of Santa Teresa Boulevard, and along both sides of Watsonville Road, north of the intersection of Sunnyside Avenue/Santa Teresa Boulevard and Watsonville Road. In addition, the unsignalized intersection of Sunnyside Avenue/Santa Teresa Boulevard and Watsonville Road includes a crosswalk across the south approach, providing a connection between sidewalks on the eastern sides of Sunnyside Avenue and Santa Teresa Boulevard. The proposed project would provide new continuous eight-foot-wide meandering sidewalks along the Watsonville Road frontage and a 150-linear foot segment of Santa Terea Boulevard. The proposed project would also include installation of two eight-foot-wide crosswalks across Watsonville Road and Santa Teresa Boulevard. It should also be noted that although not a part of the proposed project, the City of Morgan Hill plans to install a traffic signal and eastbound turn lane at the intersection of Sunnyside Avenue/Santa Teresa Boulevard and Watsonville Road as outlined in the City's

Community-Based Transportation Plan (CBTP) Report.[51] Such pedestrian facilities would provide a pedestrian connection between the project site and nearby land uses along Sunnyside Avenue and Santa Teresa Boulevard. Thus, the proposed project would not conflict with any existing or planned pedestrian facilities and would provide for improved pedestrian connectivity in the project area.

In the project vicinity, bike lanes are located along the length of Sunnyside Avenue and Santa Teresa Boulevard. The proposed project would provide a new six-foot-wide bicycle lane along the project frontage of Watsonville Road. Due to the relatively small size of the proposed project, the project is not expected to generate a significant amount of bicycle trips. Therefore, the demand generated by the proposed project could be accommodated by the existing bicycle facilities in the vicinity of the project site. Thus, the proposed project would not conflict with a program, plan, ordinance, or policy related to the City's bicycle facilities.

Bus service in the City of Morgan Hill is provided by the Santa Clara VTA, which operates local bus service with regional connections to destinations north and south of Morgan Hill. The nearest bus stop to the project site is located approximately 1.15 miles northeast at the intersection of Monterey Road/Watsonville Road. In addition, the City of Morgan Hill operates MoGo Morgan Hill Quick Ride (MoGo).[52] MoGo is an on-demand rideshare service which offers trips to and from fixed points citywide within a 10-minute walk to all neighborhoods and stops throughout the City. Because the proposed project would only slightly increase transit riders, the demands of the proposed project could be accommodated by the existing transit facilities.

Furthermore, Mitigation Measure XVII-1 requires implementation of CAPCOA VMT reduction strategies T-23 and T-25. Specifically, the project applicant would be required to extend transit network coverage or hours (CAPCOA Handbook Strategy T-25) for MoGo by paying a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200), which would support the City's MoGo rideshare service for current and future use up to 20 years. The City of Morgan Hill calculated the MoGo fees using a rate of two persons per household. Under the existing zoning designations for the site (RE-1 and RPD), each single-family property is allowed at least one dwelling unit; therefore, the City conservatively estimated an average of two dwelling units per lot with an average of four persons per lot or two persons per unit. A MoGo one-way trip costs $2.50 for one rider and MoGo service is provided six days a week. The City assumed that each person would take two round trips MoGo trips per day, six days a week, which totals to $60 a week per person. As such, the City determined that the weekly MoGo cost per lot would be $240 ($60 x 4 persons). The City then multiplied the average cost per lot ($240) by 20 years and determined that the cost associated with adding miles of services and added stop(s) for the proposed development would be $4,800 per unit. Therefore, with 14 residential units, the applicant would be required to pay a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200). Mitigation Measure XVII-1 also requires the applicant to fund the construction of a 0.711-mile expansion of MoGo with up to two rideshare stops within the City of Morgan Hill.

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51 Santa Clara Valley Transportation Authority. *Morgan Hill Community-Based Transportation Plan (CBTP) Report* [pg. 31]. February 2020.

52 City of Morgan Hill. *MoGo.* Available at: https://www.morganhill.ca.gov/2329/MoGo. Accessed August 2024.

Therefore, the proposed project would not conflict with a program, plan, ordinance, or policy related to the City's transit facilities.

Conclusion

Based on the above, a ***less-than-significant*** impact would occur related to conflicting with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

b. Section 15064.3 of the CEQA Guidelines provides specific considerations for evaluating a project's transportation impacts. Pursuant to Section 15064.3, analysis of VMT attributable to a project is the most appropriate measure of transportation impacts, with other relevant considerations consisting of the effects of the project on transit and non-motorized travel. VMT is the total miles of travel by personal motorized vehicles a project is expected to generate in a day. VMT measures the full distance of personal motorized vehicle-trips, with one end within the project site. Typically, development projects that are farther from other, complementary land uses (such as a business park far from housing) and in areas without transit or active transportation infrastructure (bike lanes, sidewalks, etc.) generate more driving than development near complementary land uses with more robust transportation options. Therefore, development projects located in a central business district with high density and diversity of complementary land uses and frequent transit services are expected to internalize trips and generate shorter and fewer vehicle trips than developments located in a suburban area with low density of residential developments and no transit service in the project vicinity.

The Santa Clara Countywide VMT Evaluation Tool was used to assess project VMT.[53] Based on the project location, type of development, project description, and proposed trip reduction measures, the evaluation tool calculates the project VMT. Projects located in areas where the existing VMT is above the established threshold are referred to as being in "high-VMT areas." Projects in high-VMT areas are required to include a set of VMT reduction measures that would reduce the project VMT to the greatest extent possible.

To adhere to the State's legislation, the City is currently developing the framework for new transportation policies based on the implementation of VMT as the primary measure of transportation impacts for CEQA purposes. The new policies will replace the City's current transportation policies that are based on LOS. However, as the City has not formally adopted City-specific VMT policies, the VMT assessment for the proposed project incorporated methodology and impact thresholds recommended in the OPR Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory). In accordance with the *Technical Advisory*, VMT per capita is the recommended metric to evaluate CEQA-related transportation impacts for residential land uses, with an impact threshold of 15 percent below the existing VMT levels for residential land uses.

The Santa Clara VTA's Evaluation Tool indicates that the City-wide VMT per capita is currently 24.64. Therefore, the OPR-recommended impact threshold of 15 percent below the citywide average VMT per capita equates to 20.94 VMT per capita. The VTA Evaluation Tool determined that buildout of the proposed project would result in a total of 22.04 VMT per capita. Therefore, the VMT per capita of the proposed project would be above the OPR's recommended impact threshold of 20.94 VMT per capita.

[53] Santa Clara Countywide VMT Evaluation Tool. *Results*. Available at: https://vmttool.vta.org/. Accessed June 2024.

The CAPCOA Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity[54] sets forth VMT reduction strategies where the effectiveness of the strategies is supported by substantial evidence. Potential CAPCOA VMT reduction strategies should be relevant to the project's location and land use context. It should be noted that most of the CAPCOA VMT reduction strategies also reduce GHG emissions and criteria pollutants, considered co-benefits, by reducing the source metric of VMT (i.e., vehicle ownership, number of vehicle trips, and trip distance).

The CAPCOA strategies that are applicable to and feasible for the proposed project are described below. CAPCOA VMT reduction strategies T-18 and T-20 are incorporated into the project design, while implementation of CAPCOA VMT reduction strategies T-23 and T-25 would be required through implementation of Mitigation Measures XVII-1.

- **T-18. Provide Pedestrian Network Improvement** – This measure will increase the sidewalk coverage to improve pedestrian access. Providing sidewalks and an enhanced pedestrian network encourages people to walk instead of drive. This mode shift results in a reduction in VMT and GHG emissions; and
- **T-20. Expand Bikeway Network** – This measure will increase the length of a city or community bikeway network. A bicycle network is an interconnected system of bike lanes, bike paths, bike routes, and cycle tracks. Providing bicycle infrastructure with markings and signage on appropriately sized roads with vehicle traffic traveling at safe speeds helps to improve biking conditions (e.g., safety and convenience). In addition, expanded bikeway networks can increase access to and from transit hubs, thereby expanding the "catchment area" of the transit stop or station and increasing ridership. This encourages a mode shift from vehicles to bicycles, displacing VMT and thus reducing GHG emissions.
- **T-23. Community-Based Travel Planning** – This measure would target residences in the project area with community-based travel planning (CBTP). CBTP is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT.
- **T-25. Extend Transit Network Coverage or Hours** – This measure would expand the local transit network by either adding or modifying existing transit service or extending the operation hours to enhance the service near the project site. Starting services earlier in the morning and/or extending services to late-night hours can accommodate the commuting times of alternative-shift workers. This encourages the use of transit and therefore reduce VMT and associated GHG emissions.

CAPCOA VMT reduction strategies T-18 and T-20 would be implemented through the proposed project's design. For example, the proposed project would include the construction of sidewalks and bicycle lanes in the project vicinity, which are consistent with CAPCOA VMT reduction strategies T-18 and T-20, respectively, and thus, would result in a reduction in VMT for the proposed project. The CAPCOA Handbook's GHG Reduction Formulas for T-18 and T-20 were relied upon to determine the reduction in VMT for the proposed project. Based on the CAPCOA Handbook's GHG Reduction Formulas, the addition of approximately 0.73 mile of sidewalks and approximately 0.15 mile of bicycle

[54] California Air Pollution Control Officers Association. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*. December 2021.

lanes in the project area would result in a 0.62 percent reduction from the home-based VMT per resident associated with the proposed project. With the 0.62 percent reduction, home-based VMT per resident associated with the proposed project would be reduced to 21.9, which is still above the OPR's recommended impact threshold of 20.94 VMT per capita. Therefore, implementation of additional CAPCOA VMT reduction strategies, such as T-23 Provide CBTP and T-25 Extend Transit Network Coverage or Hours would be required to further reduce the project's VMT per capita to a less-than-significant level.

Because implementation of CAPCOA VMT reduction strategies T-23 and T-25 are not already incorporated into the proposed project, implementation of such strategies would be required by Mitigation Measure XVII-1. Consistent with CAPCOA VMT reduction strategy T-23, implementation of Mitigation Measure XVII-1 would require the project applicant to partner with a CBTP service provider such as the Santa Clara VTA or the City of Morgan Hill and ensure that CBTP services are available to project residents, and renewed on an annual basis. In compliance with CAPCOA VMT reduction strategy T-25, Mitigation Measure XVII-1 would also require the project applicant to pay fees, which would support the City's MoGo rideshare service for current and future use up to 20 years. Furthermore, Mitigation Measure XVII-1 would require the applicant to fund the construction of a 0.711-mile expansion of MoGo with up to two rideshare stops within the City of Morgan Hill. Based on the CAPCOA Handbook's GHG Reduction Formulas for T-23 and T-25, implementation of CAPCOA VMT reduction strategies T-23 and T-25 would result in a VMT reduction of 2.28 and 2.71 percent, respectively. Therefore, with implementation of Mitigation Measure XVII-1, the home-based VMT per resident associated with the proposed project would be reduced by an additional 4.99 percent.

Based on the above, implementation of CAPCOA reduction strategies T-18, T-20, T-23, and T-25 would result in a total VMT reduction of approximately 5.61 percent and the home-based VMT per resident associated with the proposed project would be reduced from 22.04 to 20.79, which is below the OPR's recommended impact threshold of 20.94 VMT per capita.

Without implementation of Mitigation Measure XVII-1, the proposed project would result in a home-based VMT per resident that would exceed the applicable threshold of 20.94. As a result, the proposed project would conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

XVII-1. *The project applicant shall implement the following CAPCOA VMT reduction strategies to reduce the number of vehicle trips that would be generated by future residents, subject to review and approval by the City Engineer. The timing for each strategy is set forth below:*

1) Community-based travel planning (CAPCOA Handbook Strategy T-23)

Prior to resident occupancy, the project applicant shall partner with a CBTP service provider such as the Santa Clara Valley

Transportation Authority (VTA) or the City of Morgan Hill and ensure that CBTP services are available to project residents.

According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.28 percent.

2) Extend Transit Network Coverage or Hours (CAPCOA Handbook Strategy T-25)

Prior to issuance of a building permit, the project applicant shall pay a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200), which would support the City's MoGo rideshare service for current and future use up to 20 years. A total of 0.554 miles of MoGo service is located within the 0.25-mile buffer surrounding the project site. The project applicant would be required to fund the construction of a 0.711-mile expansion of MoGo with up to two rideshare stops within the City of Morgan Hill, the location and design of which shall be determined by the City of Morgan Hill Development Services Department. The rideshare stop(s) shall be installed and operational prior to certificate of occupancy of the first residence.

According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.71 percent.

c,d. Primary site access would be provided by way of a right-in and right-out access driveway on northbound Watsonville Road. Site access would also be provided by the extension of Secretariat Way. The City's Design Standards specify a minimum driveway width of 16 feet for residential uses. The project driveway off of Watsonville Road and internal roadways would be 36 feet wide, and the driveways for the residences would be 16 feet wide. Thus, the roadways and driveways would meet City standards. Furthermore, the project would include the widening of Watsonville Road and improvements along the Watsonville Road frontage and Santa Teresa Boulevard.

The proposed circulation system would be designed consistent with applicable City of Morgan Hill design standards and would provide adequate width and turn radii at and along all drive/parking aisles to allow for two-way circulation, including circulation of larger vehicles such as emergency trucks, garbage trucks, and delivery trucks. While the project would include a cul-de-sac, emergency vehicles would have sufficient maneuvering space to turn around before exiting the site without encountering obstructions. Given compliance with required roadway design standards, adequate emergency vehicle access would be provided at the project site.

However, without proper planning of construction activities, construction traffic could interfere with existing roadway operations during the construction phase, which could result in a risk to public safety. Furthermore, without implementation of on-site improvements, operation of the proposed project could result in increased on-site transportation-related hazards. Therefore, while the proposed project would not result in inadequate emergency access, development of the proposed project could substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous

intersections) or incompatible uses (e.g., farm equipment) during construction activities, and, and a ***potentially significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

XVII-2. *Prior to issuance of demolition or grading permits, the project applicant shall prepare and submit a Traffic Control Plan to the City for review and approval. The Traffic Control Plan shall include, but not necessarily be limited to, the following items, to the satisfaction of the City Engineer:*

- *Truck drivers shall be notified of and required to use the most direct route between the site and U.S. Route (US) 101, as determined by the City Engineering Department;*
- *All site ingress and egress shall occur only at the main driveways to the project site and construction activities may require installation of temporary (or ultimate) traffic signals as determined by the City Engineer;*
- *Specifically-designated travel routes for large vehicles shall be monitored and controlled by flaggers for large construction vehicle ingress and egress;*
- *Warning signs indicating frequent truck entry and exit shall be posted on Watsonville Road and Santa Teresa Boulevard;*
- *Any debris and mud on nearby streets caused by trucks shall be monitored daily and may require instituting a street cleaning program;*
- *Construction employee parking shall be provided on the project site to eliminate conflicts with nearby areas. Construction of the project shall be staggered so that employee parking demand is met primarily by using on-site parking; and*
- *If importation and exportation of material becomes a traffic nuisance, the City Engineer shall limit the hours the activities can take place.*

XVIII. TRIBAL CULTURAL RESOURCES. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).	☐	☐	✖	☐
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision I of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision I of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	✖	☐

Discussion

a,b. As discussed in Section V, Cultural Resources, of this IS/MND, the project site has been subject to past disturbance, including past development and agricultural activities. Additionally, the site is generally surrounded by existing residential development. The XPI Archaeological Study prepared for the proposed project by EDS did not identify any potentially significant archaeological resources at the project site. While a 2012 Archaeological Study identified one CRHR-eligible precontact site (P-43-000640 [CA-SCL-722]) adjacent to the project site, EDS did not find any evidence that P-43-000640 (CA-SCL-722) extends into the project site; therefore, the proposed project would not impact any known precontact archaeological resources. Nonetheless, in the event that unknown tribal cultural resources are unearthed, consistent with Section 18.60.090 of the City's Municipal Code, the City standard conditions of approval, as discussed in Section V, Cultural Resources, of this IS/MND, would be implemented.

It should be noted that in compliance with AB 52 (PRC Section 21080.3.1), project notification letters were distributed to a consultation list of tribes with traditional lands or cultural places located within the project area, as identified by the NAHC, on February 1, 2024. Requests to consult were not received during the 30-day response period.

Based on the above, the proposed project is not expected to adversely impact tribal cultural resources. In addition, the project applicant would be required to comply with the City's standard conditions of approval consistent with Section 18.60.090 of the Morgan Hill Municipal Code. Therefore, a ***less-than-significant*** impact to tribal cultural resources would occur.

XIX. UTILITIES AND SERVICE SYSTEMS. *Would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	✖	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	✖	☐
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	✖	☐
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	✖	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	✖	☐

Discussion

a-c. Brief discussions of the water, wastewater, stormwater drainage, electrical, and telecommunications facilities that would serve the proposed project are included below.

Water

The City of Morgan Hill provides potable water service to its residential, commercial, industrial, and institutional customers within the City limits. The City's water system facilities include 17 groundwater wells, 10 reservoir sites, nine pumping stations, and 165 miles of pressured pipes ranging from two to 14 inches in diameter. The City has planned and constructed water projects in conjunction with new street construction in anticipation of future growth and water needs.

The proposed project would include the installation of new water lines throughout the project site. The water system would connect to new water lines and a gate valve, which would be installed within Watsonville Road, as well as an existing water main and water lines within Secretariat Way.

According to the City's Urban Water Management Plan (UWMP), the City's projected water supply far exceeds the water demand for normal, single-dry, and multiple-dry years until at least 2045.[55] For example, Table 7-2 of the UWMP indicates that, under a 2045 multiple-dry year scenario, Morgan Hill would have a 22,810 acre-feet water surplus by the third dry year. According to the City's UWMP, the water consumption rate during 2020 was approximately 150 gallons per capita per day. Given that the proposed project would result in 43 new residents, the proposed project would result in a demand of approximately

[55] City of Morgan Hill. *2020 Urban Water Management Plan* [pg. 7-4 to 7-7]. October 2021.

2,409,000 gallons, or 7.39 acre-feet per year. The 7.39 acre-feet per year increase in water demand associated with implementation of the proposed project could be accommodated by the City's existing water supplies, even after three consecutive dry years in the year 2045, as identified in the UWMP. In addition, the proposed project is consistent with the project site's General Plan land use and zoning designations; thus, the increase in water demand associated with the proposed project has been anticipated in the City's UWMP projections.

Therefore, the proposed project would not require or result in the construction of new water treatment facilities or expansion of existing facilities, and sufficient water supplies would be available to serve the project from existing entitlements and resources.

Wastewater

The proposed project would include construction of new sanitary sewer lines and sanitary sewer man holes throughout the project site, which would then direct wastewater to the existing sanitary sewer main within Secretariat Way.

The City of Morgan Hill sewer collection system consists of approximately 160 miles of gravity sewers, over 3,000 manholes, nearly three miles of force mains, and 14 lift stations. The sewer lines range in size from four inches to 30 inches in diameter and the piping system includes 26 siphons. The City's collection system directs wastewater to the South County Regional Wastewater Authority (SCRWA) Wastewater Treatment Facility (WWTF) located in southern Gilroy. SCRWA is a joint powers authority formed by the cities of Morgan Hill and Gilroy to collectively treat the wastewater of both cities.[56] The City of Morgan Hill has an allocation of 3.56 million gallons per day (MGD) from the WWTF. The average dry weather flow from the City of Morgan Hill was approximately 2.7 MGD in 2015.[57]

As discussed above, because the proposed project would be consistent with the General Plan land use and zoning designations for the project site, the wastewater demands of development within the project site were anticipated in the General Plan EIR. Currently, the expansion project is underway at the SCRWA WWTF and is expected to be complete in 2024.[58] The plant expansion will increase the facility's wastewater treatment capacity from 8.5 to 11 MGD. The General Plan EIR determined that, after expansion of the treatment plant, wastewater generated by General Plan buildout, including the project site, would not exceed the expanded permitted treatment capacity of the SCRWA WWTF facility.

Based on the above, the incremental increase in wastewater generation associated with the development of the proposed project would not require the construction of new or expansion of existing wastewater treatment facilities, as capacity is already sufficient to serve the proposed project.

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56 City of Morgan Hill. *City Council Staff Report 2163, Accept Report Regarding Wastewater System Needs and Rate Study Schedule.* February 6, 2019.

57 City of Morgan Hill. *Morgan Hill 2035 Draft Environmental Impact Report*. January 2016.

58 See https://morganhilltimes.com/expansion-to-increase-south-county-recycled-water-capacity/; Accessed July 13, 2023.

Stormwater

Issues related to stormwater infrastructure are discussed in Section X, Hydrology and Water Quality, of this IS/MND. As noted therein, the proposed project would not significantly increase stormwater flows into the City's existing system. The final drainage system design for the project will be subject to review and approval by the City of Morgan Hill City Engineer to confirm that the proposed drainage system for the project is consistent with the City's Storm Drainage Master Plan and standard stormwater-related conditions of approval. Therefore, the proposed project would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Electricity, Natural Gas, and Telecommunications

Electricity would be provided by PG&E. Internet and telephone services would be provided by Frontier Communications, AT&T, Charter Communications, or a similar service provider operating within the City. The project would not require major upgrades to, or extension of, existing infrastructure. Thus, impacts to electricity and telecommunications infrastructure would be less than significant. The City prohibits the use of natural gas infrastructure in all newly constructed buildings, unless the project applicant establishes that it is not physically feasible to construct the building without natural gas infrastructure. As required by Mitigation Measure VIII-1 in this IS/MND, natural gas infrastructure would be prohibited in the proposed residences.

Conclusion

Based on the above, the increase in water demand, wastewater generation, and stormwater drainage associated with the proposed project could be adequately accommodated by existing facilities. In addition, the project is located within an urbanized area and would not require major expansion or extension of existing water, wastewater, electrical, or telecommunications facilities in the project area.

Therefore, the proposed project would not require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater, electric power, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. Sufficient water supplies would be available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. Furthermore, adequate wastewater capacity would be available to serve the project's projected demand. Thus, a ***less-than-significant*** impact would occur.

d,e. Recology South Valley provides solid waste and recycling services to the businesses and residents of the cities of Morgan Hill and Gilroy. Recology South Valley has contracted with the Monterey Regional Waste Management District to provide solid waste disposal services at the Monterey Peninsula Landfill and Materials Recovery Facility for the waste collected by Recology.[59] Pursuant to the Landfill's current Solid Waste Facility Permit, the Landfill has a maximum permitted tonnage limit of 3,500 tons per day and a design capacity of 49,700,000 cubic yards.[60]

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[59] Andi Borowski, Environmental Services Assistant, Morgan Hill Environmental Services Department. Personal communication [email] with Jesse Fahrney, Associate, Raney Planning and Management, Inc. July 26, 2022.

[60] California Department of Resources Recycling and Recovery (CalRecycle). *Facility/Site Summary Details: Monterey Peninsula Landfill (27-AA-0010)*. Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/2642?siteID=1976. Accessed June 2024.

Considering the relatively small scale of the proposed project, and because the project is consistent with the type of development that has been planned for the project site, the proposed project would not produce enough solid waste for the landfill to exceed capacity. As such, sufficient permitted capacity exists at the Monterey Peninsula Landfill and Materials Recovery Facility to accommodate the proposed project's incremental increase in solid waste disposal needs. Furthermore, the proposed project would comply with applicable federal, State, and local statutes and regulations related to solid waste. For example, during project demolition and construction, as required by CBSC Section 4.408, the proposed project would be required to submit a Waste Management Plan to the City detailing on-site sorting of demolition and construction debris. Implementation of the Waste Management Plan would ensure that the proposed project meets established diversion requirements for reused or recycled construction waste.

Based on the above, the proposed project would comply with applicable federal, State, and local statutes and regulations related to solid waste, and a ***less-than-significant*** impact would occur related to solid waste.

XX. WILDFIRE. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:*	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	✖	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	✖	☐
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	✖	☐
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	✖	☐

Discussion

a-d. The City's Wildland Urban Interface map indicates that the project site is not located in a High or Very High FHSZ.[61] Furthermore, CAL FIRE's Fire and Resource Assessment program indicates that the project site is not located in a High or Very High FHSZ.[62] The nearest Very High FHSZ is located approximately 0.71-mile to the southwest. The proposed project would be required to comply with all applicable requirements of the CFC, as adopted by Chapter 15.44 of the City's Municipal Code, including installation of fire sprinkler systems. In addition, the CBSC includes requirements related to fire hazards for new buildings.

As noted in Section IX, Hazards and Hazardous Materials, of this IS/MND, implementation of the proposed project would not interfere with potential evacuation or response routes used by emergency response teams. The project would not conflict with the City's Emergency Operations Plan. [63] In addition, the proposed project would not include any development on, or at the base of, a substantial slope. Furthermore, development of the site with residential uses would reduce the risk of wildland fire to surrounding areas, because site improvements, such as roadways, driveways, and irrigated landscaping, would reduce readily combustible vegetation. Thus, implementation of the proposed project would not exacerbate any existing conditions or hazards related to downslope flooding or landslides, slope instability, or drainage changes. Therefore, the project area does not include any existing features that would substantially increase fire risk for future residents.

Given that the project site is located within a primarily developed urban area and is situated adjacent to existing roads, water lines, and other utilities, the proposed project would not require the development of additional infrastructure, and, thus, would not result in

[61] City of Morgan Hill. *City of Morgan Hill Wildland Urban Interface Map.* March 2009.
[62] California Department of Forestry and Fire Protection. *Fire Hazard Severity Zones in State Responsibility Area.* Available at: https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=988d431a42b242b29d89597ab693d008. Accessed June 2024.
[63] City of Morgan Hill. *Emergency Operations Plan, Revision 2.5.* January 31, 2024.

substantial fire risks related to installation or maintenance of such infrastructure. Therefore, the proposed project would not be subject to substantial risks related to wildfires, and ***no impact*** would occur.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Less-Than-Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	✖	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	✖	☐	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	✖	☐	☐

Discussion

a. As discussed in Section IV, Biological Resources, of this IS/MND, the proposed project would be required to implement mitigation measures to minimize potential impacts to the southwestern pond turtle, Crotch's bumblebee, and nesting migratory birds and raptors protected by the MBTA, such as the white-tailed kite and yellow warbler. In addition, the site does not contain known significant historical or cultural resources. Although unlikely, the possibility exists that subsurface excavation of the site during grading and other construction activities could unearth deposits of cultural significance. However, this IS/MND explains how the City's Municipal Code requires standard measures for development projects that would ensure any impacts to such resources would be less than significant. Therefore, the proposed project's impact related to degradation of the quality of the environment, substantial reduction of habitat or plant and wildlife species, and elimination of important examples of the major periods of California history or prehistory would be ***less than significant with mitigation incorporated***.

b. As discussed in Section XI, Land Use and Planning, of this IS/MND, the proposed project is consistent with the site's current General Plan land use of Residential Estate and zoning designation of RE-1 and RPD. As such, the type and intensity of growth that would be induced by the proposed project was anticipated in the 2035 General Plan and associated cumulative environmental effects were analyzed in the General Plan EIR. Furthermore, as demonstrated in this IS/MND, all potential environmental impacts that could occur as a result of project implementation would be reduced to a less-than-significant level with implementation of project-specific mitigation measures and compliance with applicable General Plan policies. When viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, development of the proposed project would not contribute to cumulative impacts in the City of Morgan Hill, and the project's contribution to the cumulative impact would be ***less than significant with mitigation incorporated***.

c. The project site would be developed in a generally urbanized and built-up area of the City of Morgan Hill. As demonstrated in Section III, Air Quality, Section IX, Hazards and

Hazardous Materials, and Section XIII, Noise, development of the proposed project would not be expected to result in substantial adverse impacts to human beings, either directly or indirectly. The potential for substantial environmental effects on human beings is addressed within this IS/MND and all impacts have been identified as less-than-significant or less-than-significant with the incorporation of mitigation measures. As such, the impact would be ***less than significant with mitigation incorporated***.

Appendix A

Air Quality and Greenhouse Gas Emissions – CalEEMod Results

Quail Vineyards Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Quail Vineyards
Construction Start Date	8/1/2024
Operational Year	2025
Lead Agency	City of Morgan Hill
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	1.80
Precipitation (days)	32.2
Location	14905 Santa Teresa Blvd, Morgan Hill, CA 95037, USA
County	Santa Clara
City	Morgan Hill
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1937
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.24

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Single Family Housing	14.0	Dwelling Unit	17.8	58,210	163,980	—	42.0	—
Other Asphalt Surfaces	39.3	1000sqft	0.46	0.00	0.00	—	—	Represents Road improvements within off-site areas and within the Watsonville ROW

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Transportation	T-35*	Provide Tra c Calming Measures
Energy	E-1	Buildings Exceed 2019 Title 24 Building Envelope Energy Efficiency Standards
Water	W-7	Adopt a Water Conservation Strategy

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.12	3.71	56.1	42.0	0.20	1.63	19.8	21.4	1.47	10.1	11.6	—	27,906	27,906	2.05	3.39	46.6	29,015
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.09	3.70	57.5	42.0	0.20	1.63	19.8	21.4	1.47	10.1	11.6	—	27,902	27,902	2.04	3.40	1.21	28,967

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.48	2.12	13.8	14.3	0.03	0.54	5.40	5.86	0.49	2.76	3.19	—	3,684	3,684	0.20	0.21	1.22	3,752
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.45	0.39	2.53	2.62	0.01	0.10	0.98	1.07	0.09	0.50	0.58	—	610	610	0.03	0.03	0.20	621

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	3.71	36.0	33.7	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,449	5,449	0.22	0.07	1.02	5,469
2025	6.12	3.71	56.1	42.0	0.20	1.63	14.9	16.5	1.40	5.20	6.60	—	27,906	27,906	2.05	3.39	46.6	29,015
2026	3.17	2.93	10.8	14.4	0.03	0.40	0.06	0.46	0.37	0.01	0.38	—	2,621	2,621	0.11	0.03	0.28	2,633
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.40	3.70	36.0	33.6	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,437	5,437	0.22	0.05	0.02	5,458
2025	6.09	3.69	57.5	42.0	0.20	1.63	19.8	21.2	1.40	10.1	11.4	—	27,902	27,902	2.04	3.40	1.21	28,967
2026	3.17	2.93	10.8	14.3	0.03	0.40	0.06	0.46	0.37	0.01	0.38	—	2,618	2,618	0.11	0.03	0.01	2,629
2027	3.11	2.88	10.3	14.3	0.03	0.36	0.06	0.42	0.33	0.01	0.34	—	2,616	2,616	0.11	0.03	0.01	2,627
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.29	1.08	10.5	9.75	0.01	0.46	5.40	5.86	0.43	2.76	3.19	—	1,582	1,582	0.06	0.02	0.09	1,589
2025	2.48	2.12	13.8	14.3	0.03	0.54	4.14	4.67	0.49	1.98	2.47	—	3,684	3,684	0.20	0.21	1.22	3,752
2026	2.26	2.09	7.70	10.2	0.02	0.29	0.04	0.33	0.26	0.01	0.27	—	1,870	1,870	0.08	0.02	0.09	1,878
2027	0.48	0.45	1.45	2.01	< 0.005	0.05	0.01	0.06	0.05	< 0.005	0.05	—	367	367	0.01	< 0.005	0.02	369

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.23	0.20	1.91	1.78	< 0.005	0.08	0.98	1.07	0.08	0.50	0.58	—	262	262	0.01	< 0.005	0.01	263
2025	0.45	0.39	2.53	2.62	0.01	0.10	0.75	0.85	0.09	0.36	0.45	—	610	610	0.03	0.03	0.20	621
2026	0.41	0.38	1.40	1.87	< 0.005	0.05	0.01	0.06	0.05	< 0.005	0.05	—	310	310	0.01	< 0.005	0.01	311
2027	0.09	0.08	0.26	0.37	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	60.8	60.8	< 0.005	< 0.005	< 0.005	61.1

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.41	3.71	36.0	33.7	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,449	5,449	0.22	0.07	1.02	5,469
2025	6.12	3.71	56.1	42.0	0.20	1.63	14.9	16.5	1.40	5.20	6.60	—	27,906	27,906	2.05	3.39	46.6	29,015
2026	3.17	2.93	10.8	14.4	0.03	0.40	0.06	0.46	0.37	0.01	0.38	—	2,621	2,621	0.11	0.03	0.28	2,633
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.40	3.70	36.0	33.6	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,437	5,437	0.22	0.05	0.02	5,458
2025	6.09	3.69	57.5	42.0	0.20	1.63	19.8	21.2	1.40	10.1	11.4	—	27,902	27,902	2.04	3.40	1.21	28,967
2026	3.17	2.93	10.8	14.3	0.03	0.40	0.06	0.46	0.37	0.01	0.38	—	2,618	2,618	0.11	0.03	0.01	2,629
2027	3.11	2.88	10.3	14.3	0.03	0.36	0.06	0.42	0.33	0.01	0.34	—	2,616	2,616	0.11	0.03	0.01	2,627
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.29	1.08	10.5	9.75	0.01	0.46	5.40	5.86	0.43	2.76	3.19	—	1,582	1,582	0.06	0.02	0.09	1,589
2025	2.48	2.12	13.8	14.3	0.03	0.54	4.14	4.67	0.49	1.98	2.47	—	3,684	3,684	0.20	0.21	1.22	3,752
2026	2.26	2.09	7.70	10.2	0.02	0.29	0.04	0.33	0.26	0.01	0.27	—	1,870	1,870	0.08	0.02	0.09	1,878
2027	0.48	0.45	1.45	2.01	< 0.005	0.05	0.01	0.06	0.05	< 0.005	0.05	—	367	367	0.01	< 0.005	0.02	369
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	0.23	0.20	1.91	1.78	< 0.005	0.08	0.98	1.07	0.08	0.50	0.58	—	262	262	0.01	< 0.005	0.01	263
2025	0.45	0.39	2.53	2.62	0.01	0.10	0.75	0.85	0.09	0.36	0.45	—	610	610	0.03	0.03	0.20	621
2026	0.41	0.38	1.40	1.87	< 0.005	0.05	0.01	0.06	0.05	< 0.005	0.05	—	310	310	0.01	< 0.005	0.01	311
2027	0.09	0.08	0.26	0.37	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	60.8	60.8	< 0.005	< 0.005	< 0.005	61.1

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.09	2.04	0.58	5.55	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.88	1,430	1,436	0.76	0.05	5.00	1,474
Mit.	2.09	2.03	0.57	5.54	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.79	1,410	1,416	0.75	0.05	5.00	1,454
% Reduced	< 0.5%	—	2%	< 0.5%	—	6%	—	< 0.5%	6%	—	< 0.5%	1%	1%	1%	2%	—	—	1%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.00	1.94	0.65	4.32	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.88	1,357	1,364	0.77	0.05	0.54	1,399
Mit.	2.00	1.94	0.63	4.32	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.79	1,337	1,344	0.75	0.05	0.54	1,378
% Reduced	< 0.5%	—	2%	< 0.5%	—	6%	—	< 0.5%	6%	—	< 0.5%	1%	1%	1%	2%	—	—	1%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.02	1.96	0.61	4.54	0.01	0.02	1.02	1.04	0.02	0.26	0.28	6.88	1,343	1,350	0.76	0.05	2.35	1,386
Mit.	2.02	1.96	0.60	4.53	0.01	0.02	1.02	1.04	0.02	0.26	0.28	6.79	1,323	1,330	0.75	0.05	2.35	1,365
% Reduced	< 0.5%	—	2%	< 0.5%	—	6%	—	< 0.5%	6%	—	< 0.5%	1%	1%	1%	2%	—	—	1%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	0.37	0.36	0.11	0.83	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	1.14	222	223	0.13	0.01	0.39	229
Mit.	0.37	0.36	0.11	0.83	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	1.12	219	220	0.12	0.01	0.39	226
% Reduced	< 0.5%	< 0.5%	2%	< 0.5%	1%	6%	—	< 0.5%	6%	—	< 0.5%	1%	1%	1%	2%	1%	—	1%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.53	0.48	0.41	4.69	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,164	1,164	0.04	0.04	4.58	1,182
Area	1.55	1.54	0.01	0.79	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.12	2.12	< 0.005	< 0.005	—	2.13
Energy	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	256	256	0.03	< 0.005	—	257
Water	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Waste	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	2.09	2.04	0.58	5.55	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.88	1,430	1,436	0.76	0.05	5.00	1,474
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.51	0.46	0.49	4.25	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,093	1,093	0.05	0.05	0.12	1,109
Area	1.47	1.47	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	256	256	0.03	< 0.005	—	257
Water	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Waste	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	2.00	1.94	0.65	4.32	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.88	1,357	1,364	0.77	0.05	0.54	1,399

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.49	0.44	0.45	4.08	0.01	0.01	1.02	1.02	0.01	0.26	0.26	—	1,078	1,078	0.04	0.04	1.93	1,095
Area	1.51	1.51	< 0.005	0.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.05	1.05	< 0.005	< 0.005	—	1.05
Energy	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	256	256	0.03	< 0.005	—	257
Water	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Waste	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	2.02	1.96	0.61	4.54	0.01	0.02	1.02	1.04	0.02	0.26	0.28	6.88	1,343	1,350	0.76	0.05	2.35	1,386
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.09	0.08	0.08	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	179	179	0.01	0.01	0.32	181
Area	0.28	0.28	< 0.005	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.17	0.17	< 0.005	< 0.005	—	0.17
Energy	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	42.3	42.3	< 0.005	< 0.005	—	42.5
Water	—	—	—	—	—	—	—	—	—	—	—	0.16	1.28	1.44	0.02	< 0.005	—	1.99
Waste	—	—	—	—	—	—	—	—	—	—	—	0.98	0.00	0.98	0.10	0.00	—	3.42
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	0.37	0.36	0.11	0.83	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	1.14	222	223	0.13	0.01	0.39	229

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.53	0.48	0.41	4.69	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,164	1,164	0.04	0.04	4.58	1,182
Area	1.55	1.54	0.01	0.79	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.12	2.12	< 0.005	< 0.005	—	2.13
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	237	237	0.02	< 0.005	—	238
Water	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2

Waste	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	2.09	2.03	0.57	5.54	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.79	1,410	1,416	0.75	0.05	5.00	1,454
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.51	0.46	0.49	4.25	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,093	1,093	0.05	0.05	0.12	1,109
Area	1.47	1.47	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	237	237	0.02	< 0.005	—	238
Water	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2
Waste	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	2.00	1.94	0.63	4.32	0.01	0.02	1.06	1.08	0.02	0.27	0.29	6.79	1,337	1,344	0.75	0.05	0.54	1,378
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.49	0.44	0.45	4.08	0.01	0.01	1.02	1.02	0.01	0.26	0.26	—	1,078	1,078	0.04	0.04	1.93	1,095
Area	1.51	1.51	< 0.005	0.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.05	1.05	< 0.005	< 0.005	—	1.05
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	237	237	0.02	< 0.005	—	238
Water	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2
Waste	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	2.02	1.96	0.60	4.53	0.01	0.02	1.02	1.04	0.02	0.26	0.28	6.79	1,323	1,330	0.75	0.05	2.35	1,365
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.09	0.08	0.08	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	179	179	0.01	0.01	0.32	181
Area	0.28	0.28	< 0.005	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.17	0.17	< 0.005	< 0.005	—	0.17
Energy	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	39.3	39.3	< 0.005	< 0.005	—	39.5
Water	—	—	—	—	—	—	—	—	—	—	—	0.14	1.06	1.20	0.02	< 0.005	—	1.69
Waste	—	—	—	—	—	—	—	—	—	—	—	0.98	0.00	0.98	0.10	0.00	—	3.42
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

Total	0.37	0.36	0.11	0.83	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	1.12	219	220	0.12	0.01	0.39	226

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.24	0.24	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.07	0.68	0.60	< 0.005	0.03	—	0.03	0.03	—	0.03	—	93.8	93.8	< 0.005	< 0.005	—	94.2
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.12	0.11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	—	15.6

Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	< 0.005	0.56	133
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.27	0.13	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	212	212	0.02	0.03	0.46	223
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.36	3.36	< 0.005	< 0.005	0.01	3.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	0.01	6.10
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	< 0.005	1.01

3.2. Demolition (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.24	0.24	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.07	0.68	0.60	< 0.005	0.03	—	0.03	0.03	—	0.03	—	93.8	93.8	< 0.005	< 0.005	—	94.2
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.12	0.11	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	15.5	15.5	< 0.005	< 0.005	—	15.6
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	< 0.005	0.56	133
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.02	< 0.005	0.27	0.13	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	212	212	0.02	0.03	0.46	223
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.36	3.36	< 0.005	< 0.005	0.01	3.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.80	5.80	< 0.005	< 0.005	0.01	6.10
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.96	0.96	< 0.005	< 0.005	< 0.005	1.01

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	9.78	8.96	0.01	0.44	—	0.44	0.40	—	0.40	—	1,441	1,441	0.06	0.01	—	1,445
Dust From Material Movement	—	—	—	—	—	—	5.35	5.35	—	2.75	2.75	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.18	1.78	1.63	< 0.005	0.08	—	0.08	0.07	—	0.07	—	238	238	0.01	< 0.005	—	239
Dust From Material Movement	—	—	—	—	—	—	0.98	0.98	—	0.50	0.50	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	0.01	0.65	155
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.66	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	142	142	< 0.005	0.01	0.02	144
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.18	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.0	39.0	< 0.005	< 0.005	0.08	39.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	9.78	8.96	0.01	0.44	—	0.44	0.40	—	0.40	—	1,441	1,441	0.06	0.01	—	1,445
Dust From Material Movement	—	—	—	—	—	—	5.35	5.35	—	2.75	2.75	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.18	1.78	1.63	< 0.005	0.08	—	0.08	0.07	—	0.07	—	238	238	0.01	< 0.005	—	239
Dust From Material Movement	—	—	—	—	—	—	0.98	0.98	—	0.50	0.50	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	0.01	0.65	155

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.66	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	142	142	< 0.005	0.01	0.02	144
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.18	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.0	39.0	< 0.005	< 0.005	0.08	39.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314

Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.55	5.26	5.02	0.01	0.23	—	0.23	0.21	—	0.21	—	881	881	0.04	0.01	—	884
Dust From Material Movement	—	—	—	—	—	—	3.27	3.27	—	1.68	1.68	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.96	0.92	< 0.005	0.04	—	0.04	0.04	—	0.04	—	146	146	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.60	0.60	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.61	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	0.02	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	23.4	23.4	< 0.005	< 0.005	0.04	23.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.87	3.87	< 0.005	< 0.005	0.01	3.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.55	5.26	5.02	0.01	0.23	—	0.23	0.21	—	0.21	—	881	881	0.04	0.01	—	884

Dust From Material Movement	—	—	—	—	—	—	3.27	3.27	—	1.68	1.68	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.96	0.92	< 0.005	0.04	—	0.04	0.04	—	0.04	—	146	146	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.60	0.60	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.61	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	0.02	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	23.4	23.4	< 0.005	< 0.005	0.04	23.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.87	3.87	< 0.005	< 0.005	0.01	3.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.28	9.28	—	3.67	3.67	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.28	9.28	—	3.67	3.67	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.18	1.63	1.55	< 0.005	0.07	—	0.07	0.06	—	0.06	—	362	362	0.01	< 0.005	—	363

Dust From Material Movement	—	—	—	—	—	—	0.51	0.51	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.30	0.28	< 0.005	0.01	—	0.01	0.01	—	0.01	—	59.9	59.9	< 0.005	< 0.005	—	60.1
Dust From Material Movement	—	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.82	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	171	171	< 0.005	0.01	0.68	174
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	2.24	0.45	26.4	12.9	0.14	0.39	5.47	5.86	0.26	1.50	1.76	—	21,136	21,136	1.78	3.33	46.0	22,219
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	0.02	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	2.22	0.43	27.8	13.0	0.14	0.39	5.47	5.86	0.26	1.50	1.76	—	21,144	21,144	1.77	3.34	1.19	22,184
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.79	8.79	< 0.005	< 0.005	0.02	8.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.12	0.02	1.49	0.71	0.01	0.02	0.30	0.32	0.01	0.08	0.10	—	1,158	1,158	0.10	0.18	1.09	1,216

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.46	1.46	< 0.005	< 0.005	< 0.005	1.48
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.27	0.13	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	192	192	0.02	0.03	0.18	201

3.8. Grading (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.28	9.28	—	3.67	3.67	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.28	9.28	—	3.67	3.67	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.21	0.18	1.63	1.55	< 0.005	0.07	—	0.07	0.06	—	0.06	—	362	362	0.01	< 0.005	—	363
Dust From Material Movement	—	—	—	—	—	—	0.51	0.51	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.30	0.28	< 0.005	0.01	—	0.01	0.01	—	0.01	—	59.9	59.9	< 0.005	< 0.005	—	60.1
Dust From Material Movement	—	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.05	0.82	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	171	171	< 0.005	0.01	0.68	174
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	2.24	0.45	26.4	12.9	0.14	0.39	5.47	5.86	0.26	1.50	1.76	—	21,136	21,136	1.78	3.33	46.0	22,219
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.70	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	159	159	< 0.005	0.01	0.02	161
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	2.22	0.43	27.8	13.0	0.14	0.39	5.47	5.86	0.26	1.50	1.76	—	21,144	21,144	1.77	3.34	1.19	22,184
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.79	8.79	< 0.005	< 0.005	0.02	8.92

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.12	0.02	1.49	0.71	0.01	0.02	0.30	0.32	0.01	0.08	0.10	—	1,158	1,158	0.10	0.18	1.09	1,216
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.46	1.46	< 0.005	< 0.005	< 0.005	1.48
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.27	0.13	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	192	192	0.02	0.03	0.18	201

3.9. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.52	4.82	6.02	0.01	0.20	—	0.20	0.18	—	0.18	—	1,107	1,107	0.04	0.01	—	1,111
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.88	1.10	< 0.005	0.04	—	0.04	0.03	—	0.03	—	183	183	0.01	< 0.005	—	184
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.2	43.2	< 0.005	< 0.005	0.17	43.9
Vendor	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.4	40.4	< 0.005	0.01	0.11	42.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.18	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	40.0	40.0	< 0.005	< 0.005	< 0.005	40.6
Vendor	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.4	40.4	< 0.005	0.01	< 0.005	42.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.7	18.7	< 0.005	< 0.005	0.03	18.9
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.7	18.7	< 0.005	< 0.005	0.02	19.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.09	3.09	< 0.005	< 0.005	0.01	3.14
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.09	3.09	< 0.005	< 0.005	< 0.005	3.23
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.52	4.82	6.02	0.01	0.20	—	0.20	0.18	—	0.18	—	1,107	1,107	0.04	0.01	—	1,111
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.88	1.10	< 0.005	0.04	—	0.04	0.03	—	0.03	—	183	183	0.01	< 0.005	—	184
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.2	43.2	< 0.005	< 0.005	0.17	43.9
Vendor	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.4	40.4	< 0.005	0.01	0.11	42.3

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.18	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	40.0	40.0	< 0.005	< 0.005	< 0.005	40.6
Vendor	< 0.005	< 0.005	0.05	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.4	40.4	< 0.005	0.01	< 0.005	42.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.7	18.7	< 0.005	< 0.005	0.03	18.9
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	18.7	18.7	< 0.005	< 0.005	0.02	19.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.09	3.09	< 0.005	< 0.005	0.01	3.14
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.09	3.09	< 0.005	< 0.005	< 0.005	3.23
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	42.4	42.4	< 0.005	< 0.005	0.15	43.0
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.7	39.7	< 0.005	0.01	0.10	41.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.16	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.3	39.3	< 0.005	< 0.005	< 0.005	39.8
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.7	39.7	< 0.005	0.01	< 0.005	41.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.3	28.3	< 0.005	< 0.005	0.05	28.8
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.3	28.3	< 0.005	< 0.005	0.03	29.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.69	4.69	< 0.005	< 0.005	0.01	4.76
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.69	4.69	< 0.005	< 0.005	< 0.005	4.91
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	42.4	42.4	< 0.005	< 0.005	0.15	43.0
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.7	39.7	< 0.005	0.01	0.10	41.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.16	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.3	39.3	< 0.005	< 0.005	< 0.005	39.8
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	39.7	39.7	< 0.005	0.01	< 0.005	41.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.3	28.3	< 0.005	< 0.005	0.05	28.8
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	28.3	28.3	< 0.005	< 0.005	0.03	29.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.69	4.69	< 0.005	< 0.005	0.01	4.76
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.69	4.69	< 0.005	< 0.005	< 0.005	4.91
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.30	1.80	< 0.005	0.05	—	0.05	0.04	—	0.04	—	333	333	0.01	< 0.005	—	334
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.24	0.33	< 0.005	0.01	—	0.01	0.01	—	0.01	—	55.1	55.1	< 0.005	< 0.005	—	55.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.02	0.01	0.01	0.15	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.5	38.5	< 0.005	< 0.005	< 0.005	39.1
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.9	38.9	< 0.005	0.01	< 0.005	40.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.41	5.41	< 0.005	< 0.005	0.01	5.49
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.40	5.40	< 0.005	< 0.005	0.01	5.66
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.90	0.90	< 0.005	< 0.005	< 0.005	0.91
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.89	0.89	< 0.005	< 0.005	< 0.005	0.94
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.17	0.14	1.30	1.80	< 0.005	0.05	—	0.05	0.04	—	0.04	—	333	333	0.01	< 0.005	—	334
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.24	0.33	< 0.005	0.01	—	0.01	0.01	—	0.01	—	55.1	55.1	< 0.005	< 0.005	—	55.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.15	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.5	38.5	< 0.005	< 0.005	< 0.005	39.1
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	38.9	38.9	< 0.005	0.01	< 0.005	40.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.41	5.41	< 0.005	< 0.005	0.01	5.49
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.40	5.40	< 0.005	< 0.005	0.01	5.66
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.90	0.90	< 0.005	< 0.005	< 0.005	0.91
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.89	0.89	< 0.005	< 0.005	< 0.005	0.94
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	0.12	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.20	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	—	41.6
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.86	6.86	< 0.005	< 0.005	—	6.88
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	129	129	< 0.005	< 0.005	0.51	131

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.30	3.30	< 0.005	< 0.005	0.01	3.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. Paving (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	0.12	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.20	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	—	41.6
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.86	6.86	< 0.005	< 0.005	—	6.88
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	129	129	< 0.005	< 0.005	0.51	131
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.30	3.30	< 0.005	< 0.005	0.01	3.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.38	0.50	< 0.005	0.01	—	0.01	0.01	—	0.01	—	58.0	58.0	< 0.005	< 0.005	—	58.2
Architectural Coatings	0.75	0.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.60	9.60	< 0.005	< 0.005	—	9.64
Architectural Coatings	0.14	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.64	8.64	< 0.005	< 0.005	0.03	8.77
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	< 0.005	8.11
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.51	3.51	< 0.005	< 0.005	0.01	3.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.59
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.18. Architectural Coating (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.38	0.50	< 0.005	0.01	—	0.01	0.01	—	0.01	—	58.0	58.0	< 0.005	< 0.005	—	58.2
Architectural Coatings	0.75	0.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.60	9.60	< 0.005	< 0.005	—	9.64
Architectural Coatings	0.14	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.64	8.64	< 0.005	< 0.005	0.03	8.77
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	< 0.005	8.11
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.51	3.51	< 0.005	< 0.005	0.01	3.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.59
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.19. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	0.61	0.81	< 0.005	0.02	—	0.02	0.02	—	0.02	—	95.4	95.4	< 0.005	< 0.005	—	95.7
Architectural Coatings	1.23	1.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.11	0.15	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.8	15.8	< 0.005	< 0.005	—	15.8
Architectural Coatings	0.22	0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.48	8.48	< 0.005	< 0.005	0.03	8.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.85	7.85	< 0.005	< 0.005	< 0.005	7.96
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.67	5.67	< 0.005	< 0.005	0.01	5.75
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.94	0.94	< 0.005	< 0.005	< 0.005	0.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.20. Architectural Coating (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	0.61	0.81	< 0.005	0.02	—	0.02	0.02	—	0.02	—	95.4	95.4	< 0.005	< 0.005	—	95.7
Architectural Coatings	1.23	1.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.11	0.15	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.8	15.8	< 0.005	< 0.005	—	15.8
Architectural Coatings	0.22	0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.48	8.48	< 0.005	< 0.005	0.03	8.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.85	7.85	< 0.005	< 0.005	< 0.005	7.96
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.67	5.67	< 0.005	< 0.005	0.01	5.75
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.94	0.94	< 0.005	< 0.005	< 0.005	0.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.21. Architectural Coating (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.14	0.19	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	22.2	22.2	< 0.005	< 0.005	—	22.3
Architectural Coatings	0.29	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.68	3.68	< 0.005	< 0.005	—	3.69

Architectural Coatings	0.05	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.71	7.71	< 0.005	< 0.005	< 0.005	7.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.30	1.30	< 0.005	< 0.005	< 0.005	1.32
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.21	0.21	< 0.005	< 0.005	< 0.005	0.22
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.22. Architectural Coating (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	1.72	1.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.14	0.19	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	22.2	22.2	< 0.005	< 0.005	—	22.3
Architectural Coatings	0.29	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.68	3.68	< 0.005	< 0.005	—	3.69
Architectural Coatings	0.05	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.71	7.71	< 0.005	< 0.005	< 0.005	7.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.30	1.30	< 0.005	< 0.005	< 0.005	1.32
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.21	0.21	< 0.005	< 0.005	< 0.005	0.22
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.53	0.48	0.41	4.69	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,164	1,164	0.04	0.04	4.58	1,182

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.53	0.48	0.41	4.69	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,164	1,164	0.04	0.04	4.58	1,182
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.51	0.46	0.49	4.25	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,093	1,093	0.05	0.05	0.12	1,109
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.51	0.46	0.49	4.25	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,093	1,093	0.05	0.05	0.12	1,109
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.09	0.08	0.08	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	179	179	0.01	0.01	0.32	181
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.09	0.08	0.08	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	179	179	0.01	0.01	0.32	181

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.53	0.48	0.41	4.69	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,164	1,164	0.04	0.04	4.58	1,182

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.53	0.48	0.41	4.69	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,164	1,164	0.04	0.04	4.58	1,182
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.51	0.46	0.49	4.25	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,093	1,093	0.05	0.05	0.12	1,109
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.51	0.46	0.49	4.25	0.01	0.01	1.06	1.07	0.01	0.27	0.28	—	1,093	1,093	0.05	0.05	0.12	1,109
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.09	0.08	0.08	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	179	179	0.01	0.01	0.32	181
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.09	0.08	0.08	0.74	< 0.005	< 0.005	0.19	0.19	< 0.005	0.05	0.05	—	179	179	0.01	0.01	0.32	181

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	48.4	48.4	0.01	< 0.005	—	48.9
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	48.4	48.4	0.01	< 0.005	—	48.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	48.4	48.4	0.01	< 0.005	—	48.9
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	48.4	48.4	0.01	< 0.005	—	48.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	8.01	8.01	< 0.005	< 0.005	—	8.09
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	8.01	8.01	< 0.005	< 0.005	—	8.09

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	48.3	48.3	0.01	< 0.005	—	48.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	48.3	48.3	0.01	< 0.005	—	48.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	48.3	48.3	0.01	< 0.005	—	48.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	48.3	48.3	0.01	< 0.005	—	48.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	8.00	8.00	< 0.005	< 0.005	—	8.07
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	8.00	8.00	< 0.005	< 0.005	—	8.07

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	207	207	0.02	< 0.005	—	208
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	207	207	0.02	< 0.005	—	208
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	207	207	0.02	< 0.005	—	208
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.16	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	207	207	0.02	< 0.005	—	208
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	34.3	34.3	< 0.005	< 0.005	—	34.4
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	34.3	34.3	< 0.005	< 0.005	—	34.4

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	189	189	0.02	< 0.005	—	190
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	189	189	0.02	< 0.005	—	190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	189	189	0.02	< 0.005	—	190
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	189	189	0.02	< 0.005	—	190
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	31.3	31.3	< 0.005	< 0.005	—	31.4
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	31.3	31.3	< 0.005	< 0.005	—	31.4

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.25	1.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.08	0.07	0.01	0.79	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.12	2.12	< 0.005	< 0.005	—	2.13
Total	1.55	1.54	0.01	0.79	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.12	2.12	< 0.005	< 0.005	—	2.13
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.25	1.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.47	1.47	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.04	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape	0.01	0.01	< 0.005	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.17	0.17	< 0.005	< 0.005	—	0.17
Total	0.28	0.28	< 0.005	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.17	0.17	< 0.005	< 0.005	—	0.17

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.25	1.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.08	0.07	0.01	0.79	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.12	2.12	< 0.005	< 0.005	—	2.13
Total	1.55	1.54	0.01	0.79	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.12	2.12	< 0.005	< 0.005	—	2.13
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.25	1.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.47	1.47	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	0.23	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.04	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.01	0.01	< 0.005	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.17	0.17	< 0.005	< 0.005	—	0.17
Total	0.28	0.28	< 0.005	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.17	0.17	< 0.005	< 0.005	—	0.17

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.97	7.75	8.72	0.10	< 0.005	—	12.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.16	1.28	1.44	0.02	< 0.005	—	1.99
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.16	1.28	1.44	0.02	< 0.005	—	1.99

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.88	6.38	7.26	0.09	< 0.005	—	10.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.14	1.06	1.20	0.02	< 0.005	—	1.69
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.14	1.06	1.20	0.02	< 0.005	—	1.69

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.98	0.00	0.98	0.10	0.00	—	3.42
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.98	0.00	0.98	0.10	0.00	—	3.42

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.91	0.00	5.91	0.59	0.00	—	20.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.98	0.00	0.98	0.10	0.00	—	3.42
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.98	0.00	0.98	0.10	0.00	—	3.42

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.42	0.42
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipme Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	8/1/2024	8/14/2024	5.00	10.0	—
Site Preparation	Site Preparation	8/15/2024	3/26/2025	5.00	160	—
Grading	Grading	3/27/2025	4/23/2025	5.00	20.0	—
Building Construction	Building Construction	5/10/2025	3/12/2027	5.00	480	—
Paving	Paving	4/26/2025	5/9/2025	5.00	10.0	—
Architectural Coating	Architectural Coating	5/24/2025	3/26/2027	5.00	480	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37

Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74

Building Construction	Tractors/Loaders/Backh	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	2.90	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	295	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—

Building Construction	Worker	5.04	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	1.50	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.01	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	2.90	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT

Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	295	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	5.04	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	1.50	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.01	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	117,875	39,292	0.00	0.00	1,202

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	2,500	—
Site Preparation	—	—	240	0.00	—
Grading	42,974	4,241	60.0	0.00	—
Paving	0.00	0.00	0.00	0.00	0.61

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.15	0%
Other Asphalt Surfaces	0.46	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

2027	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	132	134	120	47,662	1,491	1,507	1,350	537,658
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	132	134	120	47,662	1,491	1,507	1,350	537,658
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0

No Fireplaces	14
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	14
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
117875.25	39,292	0.00	0.00	1,202

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00

Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	86,588	204	0.0330	0.0040	647,107
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	86,412	204	0.0330	0.0040	589,717
Other Asphalt Surfaces	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	507,730	2,142,576
Other Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	456,957	1,714,061
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	11.0	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	11.0	—
Other Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

Appendix B

Updated Biological Resources Report

H. T. HARVEY & ASSOCIATES

Ecological Consultants

50 years of field notes, exploration, and excellence

Quail Vineyards Project
Updated Biological Resources Report

Project #3398-03

Prepared for:

Blackrock LLC
2730 Lone Oak Court
Gilroy, CA 95020

Prepared by:

H. T. Harvey & Associates

September 21, 2023

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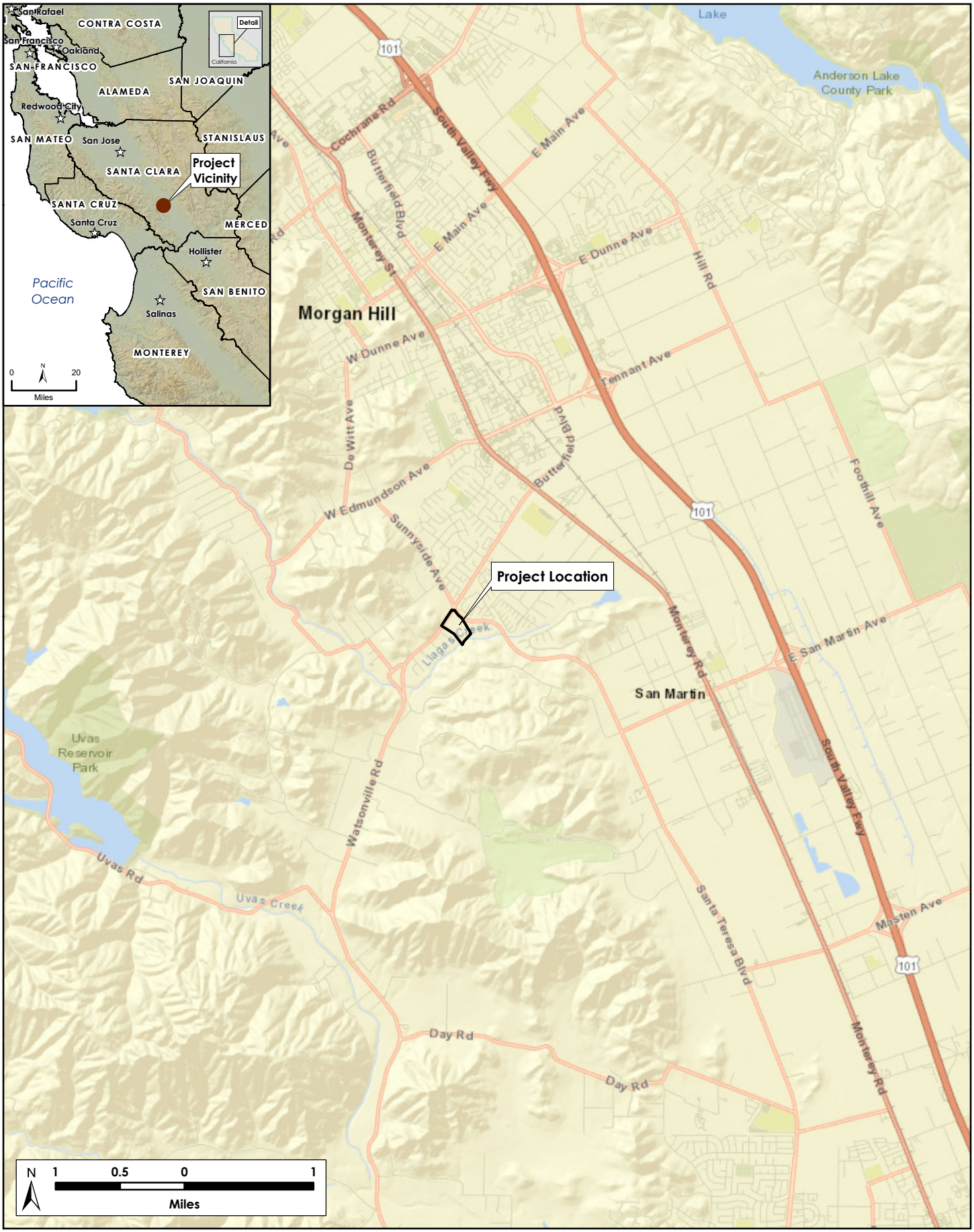
Section 1. Introduction

This biological resources report was prepared by H. T. Harvey & Associates for the approximately 18.54-acre parcel located on the south corner of Watsonville Road and Santa Teresa Boulevard in Morgan Hill, California within the *Mt. Madonna, California* U. S. Geological Survey (USGS) 7.5-minute quadrangle (Figure 1). The project site is located in the southwestern corner of the City of Morgan Hill, just inside the city's urban growth boundary. The project site lies immediately to the east of the foothills of the Santa Cruz Mountains, and Llagas Creek runs through the project site.

The project site has a long history of intensive agricultural land uses. A barn on the site dates back to the late 19th century. More recently, the land has been used as a Christmas tree farm and as a walnut (*Juglans* spp.) orchard. The project site also includes a single-family residence, pool, and storage shed. Due to intensive agricultural practices, the area has been heavily disturbed, and little natural vegetation remains. Only the riparian area along Llagas Creek remains in a relatively undisturbed, natural state (Figure 2).

The proposed project consists of a residential subdivision and the creation of 14 single-family home sites, as well as associated interior roads. Most of the parcel will be cleared and graded, roads and infrastructure will be built, and home sites will be constructed.

This report describes the biological resources present on the project site, as well as the potential biological impacts of proposed development activities and measures necessary to reduce these impacts to less-than-significant levels under the California Environmental Quality Act (CEQA). This assessment is based on the project maps and description provided to H. T. Harvey & Associates by MH Engineering through September 2023.



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H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 1. Vicinity Map
Quail Vineyards Project - Biological Resources Report (3398-03)
September 2023

N:\Projects3300\3398-01\03\Reports\Biotic Resources\Fig 2 Project Site.mxd

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Figure 2. Project Site
Quail Vineyards Project - Biological Resources Report (3398-03)
September 2023

Section 2. Methods

2.1 Background Review

H. T. Harvey & Associates first evaluated biological resources on the project site in 2012. Follow-up site visits were then conducted in 2017, 2022, and 2023 to update existing conditions. Prior to conducting field work, H. T. Harvey & Associates ecologists reviewed the project description, plans, and maps provided by MH Engineering; aerial images (Google Inc. 2023); a USGS topographic map; the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CNDDB) (2023); habitat and species information from the VHP (ICF International 2012); and other relevant reports, scientific literature, and technical databases.

In addition, for plants, we reviewed all species on current California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1A, 1B, 2A, and 2B lists occurring in the project region, which is defined as the *Mt. Madonna, California* USGS 7.5-minute quadrangle and surrounding quadrangles. Quadrangle-level results are not maintained for CRPR 3 and 4 species, so we also conducted a search of the CNPS Inventory records for these species occurring in Santa Clara County (CNPS 2023). In addition, we queried the CNDDB (2023) for natural communities of special concern that occur within the project footprint.

2.2 Site Visits

On June 7 and 12, 2012, H. T. Harvey & Associates botanist C. Gurney, M.S., conducted reconnaissance surveys of the project site. He was joined on June 12 by wildlife ecologist M. Timmer, M.S. The purpose of these surveys was to provide a project-specific impact assessment for development of the proposed project as described above. Specifically, surveys were conducted to: (1) assess existing biotic habitats and plant and animal communities on the project site, (2) assess the project site for its potential to support special-status species and their habitats, and (3) identify potential jurisdictional habitats such as waters of the U.S. and riparian habitat.

Follow-up surveys were conducted by H. T. Harvey senior wildlife ecologist S. Rottenborn, Ph.D. to observe updated site conditions on December 16, 2017 and September 7, 2023. Rottenborn also visited the site on September 30, 2022 to map the outer edge of riparian canopy and top of bank along Llagas Creek, and on March 30, 2023, he visited the site with representatives of the Santa Clara Valley Water District and MH Engineering to refine the top of bank mapping. MH Engineering surveyed flagging marking the edge of the riparian canopy and top of bank. This survey information was used as the basis for the mapping of the riparian canopy edge and top of bank in this report (e.g., Figure 7).

Section 3. Regulatory Setting

Biological resources within the project footprint are regulated by a number of federal, state, and local laws and ordinances, as described below.

3.1 Federal Regulations

3.1.1 Clean Water Act

The Clean Water Act (CWA) functions to maintain and restore the physical, chemical, and biological integrity of waters of the U.S., which include, but are not limited to, tributaries to traditionally navigable waters currently or historically used for interstate or foreign commerce, and adjacent wetlands. Historically, in non-tidal waters, U.S. Army Corps of Engineers (USACE) jurisdiction extends to the ordinary high water (OHW) mark, which is defined in Title 33, Code of Federal Regulations, Part 328.3. If there are wetlands adjacent to channelized features, the limits of USACE jurisdiction extend beyond the OHW mark to the outer edges of the wetlands. Wetlands that are not adjacent to waters of the U.S. are termed "isolated wetlands" and, depending on the circumstances, may be subject to USACE jurisdiction. In tidal waters, USACE jurisdiction extends to the landward extent of vegetation associated with salt or brackish water or the high tide line. The high tide line is defined in 33 Code of Federal Regulations Part 328.3 as "the line of intersection of the land with the water's surface at the maximum height reached by a rising tide." If there are wetlands adjacent to channelized features, the limits of USACE jurisdiction extend beyond the OHW mark or high tide line to the outer edges of the wetlands.

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit will be effective in the absence of Section 401 Water Quality Certification. The State Water Resources Control Board (SWRCB) is the state agency (together with the Regional Water Quality Control Boards [RWQCBs]) charged with implementing water quality certification in California.

Project Applicability: Llagas Creek is regulated by the USACE as waters of the U.S. up to the OHW mark, but no other wetlands or other waters of the U.S. are present on the project site. Because the project will not impact Llagas Creek, a permit from the USACE would not be required for the project.

3.1.2 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) protects federally listed wildlife species from harm or *take*, which is broadly defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." *Take* can also include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as *take* even if it is unintentional or

accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under the FESA only if they occur on federal lands.

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have jurisdiction over federally listed, threatened, and endangered species under FESA. The USFWS also maintains lists of proposed and candidate species. Species on these lists are not legally protected under FESA, but may become listed in the near future and are often included in their review of a project.

Project Applicability: The federally threatened South-Central California Coast steelhead (*Oncorhynchus mykiss*) is known to occur in Llagas Creek and therefore occurs on the project site. No impacts to the creek, or to steelhead, will result from the project, and thus no take approval from NMFS will be necessary. The monarch butterfly (*Danaus plexippus*) and southwestern pond turtle (*Emys pallida*) are candidates for federal listing, and both species may occur on the project site.

3.1.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act governs all fishery management activities that occur in federal waters within the United States' 200-nautical-mile limit. The Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans (FMPs) to achieve the optimum yield from U.S. fisheries in their regions. These councils, with assistance from NMFS, establish Essential Fish Habitat (EFH) in FMPs for all managed species. Federal agencies that fund, permit, or implement activities that may adversely affect EFH are required to consult with NMFS regarding potential adverse effects of their actions on EFH, and respond in writing to recommendations by NMFS.

Project Applicability: No fish species regulated by NMFS under any FMPs are present in Llagas Creek, and therefore no EFH is present on the project site. The project will not result in any impacts to EFH or FMP-regulated species.

3.1.4 Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA), 16 U.S.C. Section 703, prohibits killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The MBTA protects whole birds, parts of birds, and bird eggs and nests, and it prohibits the possession of all nests of protected bird species whether they are active or inactive. An *active* nest is defined as having eggs or young, as described by the USFWS in its June 14, 2018 memorandum "Destruction and Relocation of Migratory Bird Nest Contents". Nest starts (nests that are under construction and do not yet contain eggs) and inactive nests are not protected from destruction.

Project Applicability: All native bird species that occur on the project site are protected under the MBTA except California quail (*Callipepla californica*), which is among the species explicitly not afforded MBTA protection.

3.2 State Regulations

3.2.1 Porter-Cologne Water Quality Control Act

The SWRCB works in coordination with the nine RWQCBs to preserve, protect, enhance, and restore water quality. Each RWQCB makes decisions related to water quality for its region, and may approve, with or without conditions, or deny projects that could affect waters of the state. Their authority comes from the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne). Porter-Cologne broadly defines waters of the state as "any surface water or groundwater, including saline waters, within the boundaries of the state." Because Porter-Cologne applies to any water, whereas the CWA applies only to certain waters, California's jurisdictional reach overlaps and may exceed the boundaries of waters of the U.S. For example, Water Quality Order No. 2004-0004-DWQ states that "shallow" waters of the state include headwaters, wetlands, and riparian areas. Moreover, the San Francisco Bay Region RWQCB's Assistant Executive Director has stated that, in practice, the RWQCBs claim jurisdiction over riparian areas. Where riparian habitat is not present, such as may be the case at headwaters, jurisdiction is taken to the top of bank.

On April 2, 2019, the SWRCB adopted the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. In these new guidelines, riparian habitats are not specifically described as waters of the state but instead as important buffer habitats to streams that do conform to the State Wetland Definition. The *Procedures* describe riparian habitat buffers as important resources that may both be included in required mitigation packages for permits for impacts to waters of the state, as well as areas requiring permit authorization from the RWQCBs to impact.

Pursuant to the CWA, projects that are regulated by the USACE must also obtain a Section 401 Water Quality Certification permit from the RWQCB. This certification ensures that a proposed project will uphold state water quality standards. Because California's jurisdiction to regulate its water resources is much broader than that of the federal government, proposed impacts on waters of the state require Water Quality Certification even if the area occurs outside of USACE jurisdiction. Moreover, the RWQCB may impose mitigation requirements even if the USACE does not. Under the Porter-Cologne, the SWRCB and the nine regional boards also have the responsibility of granting CWA National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. These regulations limit impacts on aquatic and riparian habitats from a variety of urban sources.

Project Applicability: The RWQCB would consider Llagas Creek, as well as areas within the creek's bank up to the top of bank and all associated riparian habitat, to be waters of the state. No impacts to waters of the state waters or riparian habitat will result from the project, and a Section 401 permit or Waste Discharge Requirement from the RWQCB would not be required.

3.2.2 California Endangered Species Act

The California Endangered Species Act (CESA; California Fish and Game Code, Chapter 1.5, Sections 2050-2116) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with CESA, the CDFW has jurisdiction over state-listed species (Fish and Game Code 2070). The CDFW regulates activities that may result in *take* of individuals (i.e., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of *take* under the California Fish and Game Code. The CDFW, however, has interpreted *take* to include the "killing of a member of a species which is the proximate result of habitat modification."

Project Applicability: No CESA-listed species are known to occur on the project site. The Crotch's bumble bee (*Bombus crotchii*), a candidate for state listing, could possibly occur on the site, though the site provides no high-quality floral resources that would attract this species, and the probability of Crotch's bumble bee occurrence on the site is low. Similarly, the mountain lion (*Puma concolor*) is a candidate for listing under CESA, and there is some potential (albeit low) that this species may occasionally disperse along Llagas Creek on the project site.

3.2.3 California Environmental Quality Act

CEQA is a state law that requires state and local agencies to document and consider the environmental implications of their actions and to refrain from approving projects with significant environmental effects if there are feasible alternatives or mitigation measures that can substantially lessen or avoid those effects. CEQA requires the full disclosure of the environmental effects of agency actions, such as approval of a general plan update or the projects covered by that plan, on resources such as air quality, water quality, cultural resources, and biological resources. The State Resources Agency promulgated guidelines for implementing CEQA known as the State CEQA Guidelines.

Section 15380(b) of the State CEQA Guidelines provides that a species not listed on the federal or state lists of protected species may be considered rare if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions in the FESA and the CESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW or species that are locally or regionally rare.

The CDFW has produced three lists (amphibians and reptiles, birds, and mammals) of "species of special concern" that serve as "watch lists". Species on these lists are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review as potential rare species, but do not have specific statutory protection. All potentially rare or sensitive species, or habitats capable of supporting rare species, are considered for environmental review per the CEQA Section 15380(b).

The CNPS, a non-governmental conservation organization, has developed CRPRs for plant species of concern in California in the CNPS Inventory of Rare and Endangered Plants. The CRPRs include lichens, vascular, and non-vascular plants, and are defined as follows:

- CRPR 1A Plants considered extinct.
- CRPR 1B Plants rare, threatened, or endangered in California and elsewhere.
- CRPR 2A Plants considered extinct in California but more common elsewhere.
- CRPR 2B Plants rare, threatened, or endangered in California but more common elsewhere.
- CRPR 3 Plants about which more information is needed - review list.
- CRPR 4 Plants of limited distribution-watch list.

The CRPRs are further described by the following threat code extensions:

- .1—seriously endangered in California;
- .2—fairly endangered in California;
- .3—not very endangered in California.

Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants appearing as CRPR 1B or 2 are, in general, considered to meet CEQA's Section 15380 criteria, and adverse effects to these species may be considered significant. Impacts on plants that are listed by the CNPS on CRPR 3 or 4 are also considered during CEQA review, although because these species are typically not as rare as those of CRPR 1B or 2, impacts on them are less frequently considered significant.

Compliance with CEQA Guidelines Section 15065(a) requires consideration of natural communities of special concern, in addition to plant and wildlife species. Vegetation types of "special concern" are tracked in Rarefind (CNDDB 2023). Further, the CDFW ranks sensitive vegetation alliances based on their global (G) and state (S) rankings analogous to those provided in the CNDDB. Global rankings (G1–G5) of natural communities reflect the overall condition (rarity and endangerment) of a habitat throughout its range, whereas S rankings are a reflection of the condition of a habitat within California. If an alliance is marked as a G1–G3, all of the associations within it would also be of high priority. The CDFW provides the Vegetation Classification and Mapping Program's (VegCAMP's) currently accepted list of vegetation alliances and associations (CDFW 2023).

Project Applicability: All potential impacts on biological resources will be considered during CEQA review of the project in the context of this biological resources report. Project impacts are discussed in Section 6 below.

3.2.4 California Fish and Game Code

Ephemeral and intermittent streams, rivers, creeks, dry washes, sloughs, blue line streams on USGS maps, and watercourses with subsurface flows fall under CDFW jurisdiction. Canals, aqueducts, irrigation ditches, and other means of water conveyance may also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. A *stream* is defined in Title 14, California Code of Regulations Section 1.72, as "a body of water that follows at least periodically or intermittently through a bed or channel having banks and that supports fish and other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." Using this definition, CDFW extends its jurisdiction to encompass riparian habitats that function as a part of a watercourse. California Fish and Game Code Section 2786 defines *riparian habitat* as "lands which contain habitat which grows close to and which depends upon soil moisture from a nearby freshwater source." The lateral extent of a stream and associated riparian habitat that would fall under the jurisdiction of CDFW can be measured in several ways, depending on the particular situation and the type of fish or wildlife at risk. At minimum, CDFW would claim jurisdiction over a stream's bed and bank. Where riparian habitat is present, the outer edge of riparian vegetation is generally used as the line of demarcation between riparian and upland habitats.

Pursuant to California Fish and Game Code Section 1603, CDFW regulates any project proposed by any person that will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds." California Fish and Game Code Section 1602 requires an entity to notify CDFW of any proposed activity that may modify a river, stream, or lake. If CDFW determines that proposed activities may substantially adversely affect fish and wildlife resources, a Lake and Streambed Alteration Agreement (LSAA) must be prepared. The LSAA sets reasonable conditions necessary to protect fish and wildlife, and must comply with CEQA. The applicant may then proceed with the activity in accordance with the final LSAA.

Certain sections of the California Fish and Game Code describe regulations pertaining to protection of certain wildlife species. For example, Code Section 2000 prohibits take of any bird, mammal, fish, reptile, or amphibian except as provided by other sections of the code.

The California Fish and Game Code Sections 3503, 3513, and 3800 (and other sections and subsections) protect native birds, including their nests and eggs, from all forms of take. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered *take* by the CDFW. Raptors (e.g., eagles, hawks, and owls) and their nests are specifically protected in California under Code Section 3503.5. Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

Bats and other non-game mammals are protected by California Fish and Game Code Section 4150, which states that all non-game mammals or parts thereof may not be taken or possessed except as provided otherwise in the

code or in accordance with regulations adopted by the commission. Activities resulting in mortality of non-game mammals (e.g., destruction of an occupied nonbreeding bat roost, resulting in the death of bats), or disturbance that causes the loss of a maternity colony of bats (resulting in the death of young), may be considered *take* by the CDFW.

Project Applicability: CDFW jurisdiction under Section 1602 of the California Fish and Game Code would extend up to the top of bank of Llagas Creek, and would extend above top of bank in some areas to the outer edge of the riparian canopy. There will be no project impacts on CDFW jurisdiction because no work is proposed within the top of bank or in riparian habitat. Therefore, a CDFW LSAA would not be required for the project.

Most native bird, mammal, and other wildlife species that occur on the project site and in the immediate vicinity are protected under the California Fish and Game Code. Project impacts on these species are discussed in Section 6.

3.2.5 State Water Resources Control Board Stormwater Regulation

Construction Phase. Construction projects in California causing land disturbances that are equal to 1 acre or greater must comply with state requirements to control the discharge of stormwater pollutants under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit; Water Board Order No. 2009-0009-DWQ, as amended and administratively extended). Prior to the start of construction/demolition, a Notice of Intent must be filed with the SWRCB describing the project. A Storm Water Pollution Prevention Plan must be developed and maintained during the project and it must include the use of best management practices (BMPs) to protect water quality until the site is stabilized.

Standard permit conditions under the Construction General Permit requires that the applicant utilize various measures including: on-site sediment control BMPs, damp street sweeping, temporary cover of disturbed land surfaces to control erosion during construction, and utilization of stabilized construction entrances and/or wash racks, among other factors. Additionally, the Construction General Permit does not extend coverage to projects if stormwater discharge-related activities are likely to jeopardize the continued existence, or result in take of any federally listed endangered or threatened species.

Post-Construction Phase. In many Bay Area counties, including Santa Clara County, projects must also comply with the California RWQCB, San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit (Water Board Order No. R2-2015-0049, as amended). This permit requires that all projects implement BMPs and incorporate Low Impact Development practices into the design that prevent stormwater runoff pollution, promote infiltration, and hold/slow down the volume of water coming from a site. In order to meet these permit and policy requirements, projects must incorporate the use of green roofs, impervious surfaces, tree planters, grassy swales, bioretention and/or detention basins, among other factors.

Project Applicability. The project will comply with the requirements of the NPDES Statewide Storm Water Permit and Statewide General Construction Permit. Therefore, construction-phase activities would not result in detrimental water quality effects on biological or regulated resources.

3.3 Local Regulations

3.3.1 City of Morgan Hill Tree Ordinance

The City of Morgan Hill tree ordinance (Morgan Hill Municipal Code Chapter 12.32) requires a tree removal permit for removal of any tree on any city or private property with a circumference greater than 40 inches or more for nonindigenous species and 18 inches or more for indigenous species measured at 4.5 feet vertically above the ground or immediately below the lowest branch, whichever is lower, and having the inherent capacity of naturally producing one main axis continuing to grow more vigorously than the lateral axes. A tree removal permit is required for removal of trees of any size within a public right-of-way.

To obtain a tree removal permit, the applicant must submit: (1) a site plan, including location, type, and size of trees to be removed; (2) a disposal plan for felled wood (the City prefers composting or mulching over burning land filling); and (3) a letter of justification of tree removal, including a description of the condition of the tree(s), an explanation of why removal of the tree is requested, photographs showing the condition of the tree(s), and any other information pertinent to the request. The applicant also must agree to post a Public Notice for Tree Removal Permit.

Project Applicability: A tree survey was performed on the project site by Moki Smith Tree Specialists, Inc on June 24, 2022. That tree survey identified a number of trees that meet the City's criteria for ordinance-sized trees (Moki Smith Tree Specialists, Inc 2022). The project will comply with the City's tree ordinance for any trees that need to be removed.

3.3.2 Santa Clara Valley Habitat Plan

The VHP (ICF International 2012) provides a framework for promoting the protection and recovery of natural resources, including endangered and threatened species, while streamlining the permitting process for planned development, infrastructure, and maintenance activities. The VHP allows the County of Santa Clara, Santa Clara Valley Water District (Valley Water), the Santa Clara Valley Transportation Authority, and the cities of Gilroy, Morgan Hill, and San José (collectively, the Local Partners or Permittees) to receive endangered species permits for activities and projects they conduct and those under their jurisdiction. The Santa Clara Valley Open Space Authority also contributed to VHP preparation. The VHP will protect, enhance, and restore natural resources in specific areas of Santa Clara County and contribute to the recovery of endangered species. Rather than separately permitting and mitigating individual projects, the VHP evaluates natural-resource impacts and mitigation requirements comprehensively in a way that is more efficient and effective for at-risk species and their essential habitats.

The VHP was developed in association with the USFWS and CDFW and in consultation with stakeholder groups and the general public. The USFWS has issued the Permittees a 50-year permit that authorizes incidental take of listed species under FESA, while CDFW has issued a 50-year permit that authorizes take of all covered species under the Natural Community Conservation Planning Act. This approach allows the Permittees to streamline future mitigation requirements into one comprehensive program. In addition to obtaining take authorization for each participating agency's respective activities, the cities and County will be able to extend take authorization to project applicants under their jurisdiction.

The USFWS and CDFW will also provide assurances to the Permittees that no further commitments of funds, land, or water will be required to address impacts on covered species beyond that described in the VHP to address changed circumstances. In addition to strengthening local control over land use and species protection, the VHP provides a more efficient process for protecting natural resources by creating new habitat reserves that will be larger in scale, more ecologically valuable, and easier to manage than the individual mitigation sites created under the current approach.

The VHP and associated documents are approved and adopted by the six Local Partners (Cities of Gilroy, Morgan Hill and San José, County of Santa Clara, Santa Clara Valley Transportation Authority, and Valley Water).

Project Applicability. The project is located within the VHP permit area. Therefore, project activities are considered covered under the VHP, and the project will comply with VHP conditions.

Section 4. Environmental Setting

4.1 General Project Area Description

The project region includes a mix of rural county, single-family residential, residential estate, and industrial land uses. The climate in the region is Mediterranean with warm, dry summers and cool, wet winters. The average annual precipitation at the site is approximately 21 inches, and the average annual temperature is 60 degrees Fahrenheit (°F) (Western Regional Climate Center 2023).

Topography within the project site is relatively flat, with elevations ranging from approximately 330 to 345 feet (ft) above mean sea level. The National Wetlands Inventory (USFWS 2023) depicts one wetland feature within the project site, Llagas Creek, which is Palustrine, forested, seasonally flooded. The soils underlying the Project area include Zamora clay loam (0 to 2 percent slopes), Pleasanton loam (0 to 2 percent slopes), and Riverwash. Zamora clay loam is associated with alluvial fans in the Paradise Valley area; effective rooting depth is very deep, available water holding capacity is 11 to 12 inches, runoff is very slow, and fertility is high. Pleasanton loam occurs on broad, old alluvial fans; effective rooting depth is very deep, available water holding capacity is 9 to 11 inches, runoff is very slow, and fertility is moderate. Riverwash is a mixture of sand, gravel, and cobblestones that contains little or no silt or clay, and is associated with stream channels (Natural Resource Conservation Service 2023).

4.2 Land Cover

Biotic habitats within the project footprint were classified according to the land cover classification system described in the VHP (ICF International 2012), with modifications based upon site conditions verified during the September 2023 field survey. The reconnaissance-level survey identified six land cover types within the project footprint: orchard (12.44 acres), California annual grassland (2.31 acres), ornamental woodland (1.19 acres), mixed riparian woodland and forest (1.43 acres), perennial stream (0.19 acre), and urban-suburban (1.01 acres). These land cover types are described in detail below, and their distributions on the project site are shown on Figure 3. Appendix B lists the plant species observed on the project site.

4.2.1 Orchard

Vegetation. Old orchards cover the majority of the project site (12.44 acres). This habitat has been heavily disturbed by agricultural practices including cultivation of a Douglas-fir (*Pseudotsuga menziesii*) plantation in the northern portion of the property and of a walnut (*Juglans* spp.) orchard in the southern portion of the property. The Douglas-fir plantation contains a higher density of trees compared to the walnut orchard; however, both areas support similar understory vegetation dominated by weedy, non-native, annuals. Dominant grass species include wild oats (*Avena spp.*) and ripgut brome (*Bromus diandrus*); herbaceous species include Italian thistle (*Carduus pycnocephalus*), black mustard (*Brassica nigra*), and wild radish (*Raphanus sativus*). Occasional native shrub species are also present, including poison oak (*Toxicodendron diversilobum*) and coyote brush (*Baccharis pilularis*).

N:\Projects\3300\3398-01\03\Reports\Biotic Resources\Fig 3 Habitat Map.mxd

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Figure 3. Habitat Map
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Wildlife. Although most of the wildlife species found in the orchard/ruderal grassland habitat on the project site are common, widespread species associated with disturbed habitats, species present in the adjacent habitats occasionally forage in this area as well. The ruderal grasslands attract amphibians such as the western fence lizard (*Sceloporus occidentalis*) and western toad (*Anaxyrus boreas*) that feed on invertebrates found within and beneath debris in the vegetation. Bird species that forage in this habitat include the California towhee (*Melozone crissalis*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), black phoebe (*Sayornis nigricans*), and California scrub-jay (*Aphelocoma californica*), and all but the black phoebe may nest in the orchard trees. A number of small mammals, including the deer mouse (*Peromyscus maniculatus*), California mouse (*Peromyscus californicus*), broad-footed mole (*Scapanus latimanus*), and Botta's pocket gopher (*Thomomys bottae*), nest and forage within this habitat. These species in turn attract predators such as the gopher snake (*Pituophis catenifer*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), and American kestrel (*Falco sparverius*). In addition, a pair of white-tailed kites (*Elanus leucurus*) were observed hunting in the grassland among the walnut trees during the reconnaissance survey.

4.2.2 California Annual Grassland

Vegetation. California annual grassland (2.31 acres) was mapped in portions of the project site dominated extensively by grassland with few or no orchard trees. Dominant vegetation in this grassland is the same as in the understory of the orchards, as described in Section 4.2.1.

Wildlife. Wildlife use of grasslands within the project footprint is limited by the limited extent of this habitat and the isolation of this habitat from more extensive grasslands in the region (i.e., in the Diablo Range to the east). As a result, some of the wildlife species associated with extensive grasslands in the South Bay, such as the grasshopper sparrow (*Ammodramus savannarum*), are absent from the grasslands within the project footprint. Many of the wildlife species that occur in this grassland area occur primarily in adjacent developed or riparian areas and use the grasslands within the project footprint for foraging. Such species include the house finch and lesser goldfinch, which forage on seeds in grassland areas, and the black phoebe, barn swallow (*Hirundo rustica*), and Mexican free-tailed bat (*Tadarida brasiliensis*), which forage aerially over grassland habitats for insects. Burrows of California ground squirrels and Botta's pocket gopher are present within these grasslands, and the reptiles and mammals described in Section 4.2.1 as occurring in the orchards occur in the grassland land cover as well.

4.2.3 Ornamental Woodland

Vegetation. Several small stands of non-orchard tree species are located throughout the property, totaling 1.19 acres. The most notable stand, located near the center of the project site (Figure 3), supports 16 large trees ranging from 16 to 54 inches in diameter at breast height and forms a closed canopy. This stand is dominated by eight coast live oaks (*Quercus agrifolia*) and also includes several Modesto ash (*Fraxinus velutina*), a redwood (*Sequoia sempervirens*), a deodar cedar (*Cedrus deodara*), an incense cedar (*Calocedrus decurrens*), a pecan tree (*Carya illinoinensis*), and a bottle tree (*Callistemon viminalis*). Other smaller stands of non-orchard trees near the southern

property boundary include several more coast live oaks along with Monterey pines (*Pinus radiata*) and a number of valley oak (*Quercus lobata*) saplings.

Wildlife. Despite the relatively small and fragmented nature of the mixed woodland, it still supports many of the common woodland-associated species that occur in the region. Such species include the California scrub-jay, bushtit (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), chestnut-backed chickadee (*Poecile rufescens*), and white-breasted nuthatch (*Sitta carolinensis*). Deer mice, California mice, and introduced eastern gray squirrels (*Sciurus carolinensis*) nest and forage in this habitat as well, and reptiles found in the ruderal grassland habitat also forage in this habitat. Some of the trees within this land cover type provide deep bark crevices that may be used as roosting sites by small numbers of crevice-roosting bats, such as Mexican free-tailed bats, though no large crevices or large cavities capable of supporting large bat roosts, or likely to support maternity roosts, are present.

4.2.4 Mixed Riparian Woodland and Forest

Vegetation. Approximately 1.43 acres of riparian habitat occurs along Llagas Creek. The canopy cover is dominated by western sycamores (*Platanus racemosa*), willows (*Salix* spp.), and several non-native acacias (*Acacia* sp.). The riparian understory is dominated by Himalayan blackberry (*Rubus armeniacus*), poison hemlock (*Conium maculatum*), poison oak, and other shade tolerant species.

Wildlife. Riparian habitats in California generally support exceptionally rich animal communities and contribute a disproportionately high amount to landscape-level species diversity. The presence of year-round water and abundant invertebrate fauna along this reach of Llagas Creek provide foraging opportunities for many species, and the diverse habitat structure provides cover and nesting opportunities. The moderately disturbed nature of the riparian habitat on the project site limits its value to wildlife somewhat. Nonetheless, it provides important habitat for many wildlife species in the region.

The sycamores and willows along Llagas Creek attract a number of avian species to the riparian habitat. Some of these species are resident year-round, breeding in the riparian habitat in spring and summer and using it for cover and foraging during the non-breeding season. Common species nesting and foraging primarily in the riparian tree canopy include the chestnut-backed chickadee, bushtit, oak titmouse, and downy woodpecker (*Picoides pubescens*). Other resident species, such as the Bewick's wren (*Thryomanes bewickii*), spotted towhee (*Pipilo maculatus*), and song sparrow (*Melospiza melodia*), nest and forage on or very close to the ground, usually in dense vegetation. Raptors, such as red-shouldered hawks (*Buteo lineatus*) and Cooper's hawks (*Accipiter cooperii*), may nest within the riparian corridor in the project vicinity and forage in adjacent habitats year round. No evidence of raptor nests was observed within the project boundary, though red-tailed hawks (*Buteo jamaicensis*) have recently nested in large eucalyptus trees immediately adjacent to the northeast corner of the site. A rookery of great blue herons (*Ardea herodias*) and great egrets (*Ardea alba*) formerly used these eucalyptus trees for nesting, but this rookery was abandoned several years ago.

Neotropical migrants such as the Pacific-slope flycatcher (*Empidonax difficilis*) and warbling vireo (*Vireo gilvus*) may breed in the riparian vegetation along Llagas Creek, while others, including the rufous hummingbird (*Selasphorus rufus*) and western tanager (*Piranga ludoviciana*), occur in the study site only as migrants. This habitat is also used by wintering birds such as white-crowned sparrows (*Zonotrichia leucophrys*), Lincoln's sparrows (*Melospiza lincolnii*), yellow-rumped warblers (*Setophaga coronata*), and ruby-crowned kinglets (*Regulus calendula*).

A number of species of reptiles and amphibians occur in riparian corridors. Leaf litter, downed tree branches, and fallen logs provide cover for arboreal salamanders (*Aneides lugubris*), western toads, and Pacific chorus frogs (*Pseudacris sierra*). Several lizard species may also occur here, including the western fence lizard, western skink (*Eumeces skiltonianus*), and southern alligator lizard (*Elgaria multicarinata*). Small mammals such as ornate shrews (*Sorex ornatus*), California voles, and Audubon's cottontails (*Sylvilagus audubonii*) use these riparian habitats. Medium-sized mammals such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), and non-native opossums (*Didelphis virginiana*) are common, urban-adapted species present in this riparian habitat.

4.2.5 Perennial Stream

Vegetation. Approximately 0.19 acre of aquatic habitat (this acreage is also included within the 1.43 acres of mixed riparian woodland and forest) is present in the active channel of Llagas Creek. During our various visits to the project site, flow in the creek has ranged from being very low during the dry season, with water <1 foot deep observed in the channel, to extending outside of the low-flow channel and into riparian vegetation following the heavy rains in the 2022-2023 wet season. The channel bed is sparsely vegetated by weedy, disturbance tolerant species including Himalayan blackberry, poison hemlock, and poison oak.

Wildlife. Aquatic habitat within Llagas Creek supports several species of native fishes, such as the Sacramento sucker (*Catostomus occidentalis*) and sculpins (*Cottus* sp.), as well as non-native fishes such as mosquitofish (*Gambusia affinis*) and bluegill (*Lepomis macrochirus*). In addition, the federally threatened South-Central California Coast steelhead historically occurred in the section of Llagas Creek on the project site (Smith 1982), and may still be present in wet years, though likely in limited numbers owing to insufficient flows and long reaches of degraded channel downstream that make it difficult for migrating steelhead to move between upper Llagas Creek and the Pajaro River (Spencer et al. 2006). Western toads, Pacific chorus frogs, and the non-native bullfrog (*Lithobates catesbeianus*) are also present in the creek, and waterbirds such as the wood duck (*Aix sponsa*), green heron (*Butorides virescens*), and belted kingfisher (*Ceryle alcyon*) forage in these waters. Bats, including Yuma bats (*Yuma myotis*) and Mexican free-tailed bats, forage aerially on insects over Llagas Creek.

4.2.6 Urban-Suburban

Vegetation. Approximately 1.01 acres of the project site consist of developed land uses. Such areas include a residence, barn, and associated outbuildings in the eastern portion of the parcel, driveways into the site, and the terminus of Secretariat Way. Little vegetation is present in these developed areas.

Wildlife. The developed portion of the project site has limited value to wildlife. Nevertheless, the barn and residence within the project site offer nesting structure for birds such as black phoebes, barn swallows, and cliff swallows (*Petrochelidon pyrrhonota*), and a phoebe nest with nestlings was observed in the barn during the 2012 site visit. However, the interior of the barn is very open and lacks suitable crevices that might provide roosting habitat for bats. Further, no bats nor signs of bats were observed during the site visit despite a focused search for evidence of their presence and for potentially suitable roost sites (e.g., tree cavities and enclosed spaces in structures). Although small numbers of bats may roost in these buildings, no large roosts, nor any roosts of special-status bats, are expected to be present.

4.3 Wildlife Movement

Wildlife movement within and in the vicinity of the project footprint takes many forms, and is different for the various suites of species associated with these lands. Bird and bat species move readily over the landscape in the project vicinity, foraging over and within both natural lands and landscaped areas. Mammals of different species move within their home ranges, but also disperse between patches of habitat. Generally, reptiles and amphibians similarly settle within home ranges, sometimes moving to central breeding areas, upland refugia, or hibernacula in a predictable manner, but also dispersing to new areas. Some species, especially among the birds and bats, are migratory, moving into or through the project vicinity during specific seasons. Aside from bats, there are no other mammal species in the vicinity of the site that are truly migratory. However, the young of many mammal species disperse from their natal home ranges, sometimes moving over relatively long distances in search of new areas in which to establish.

Movement corridors are segments of habitat that provide linkage for wildlife through the mosaic of suitable and unsuitable habitat types found within a landscape while also providing cover. On a broader level, corridors also function as paths along which wide-ranging animals can travel, populations can move in response to environmental changes and natural disasters, and genetic interchange can occur. In California, environmental corridors often consist of riparian areas along streams, rivers, or other natural features.

Because the project site is located immediately outside of extensive, dense residential development in the City of Morgan Hill, wildlife moving around the outskirts of the City likely occur on the project site. For example, mule deer (*Odocoileus hemionus*), bobcats, coyotes (*Canis latrans*), gray foxes, and other mammals may disperse through the project site on occasion. Although they may occur anywhere on the site, the dense vegetation of the Llagas Creek corridor provides the highest-quality cover for dispersing animals. A number of aquatic species, such as fish and amphibians, disperse along the creek, which provides a high-quality dispersal corridor.

Section 5. Special-Status Species and Sensitive Habitats

CEQA requires assessment of the effects of a project on species that are protected by state, federal, or local governments as "threatened, rare, or endangered"; such species are typically described as "special-status species". For the purpose of the environmental review of the project, special-status species have been defined as described below. Impacts on these species are regulated by some of the federal, state, and local laws and ordinances described in Section 3 above.

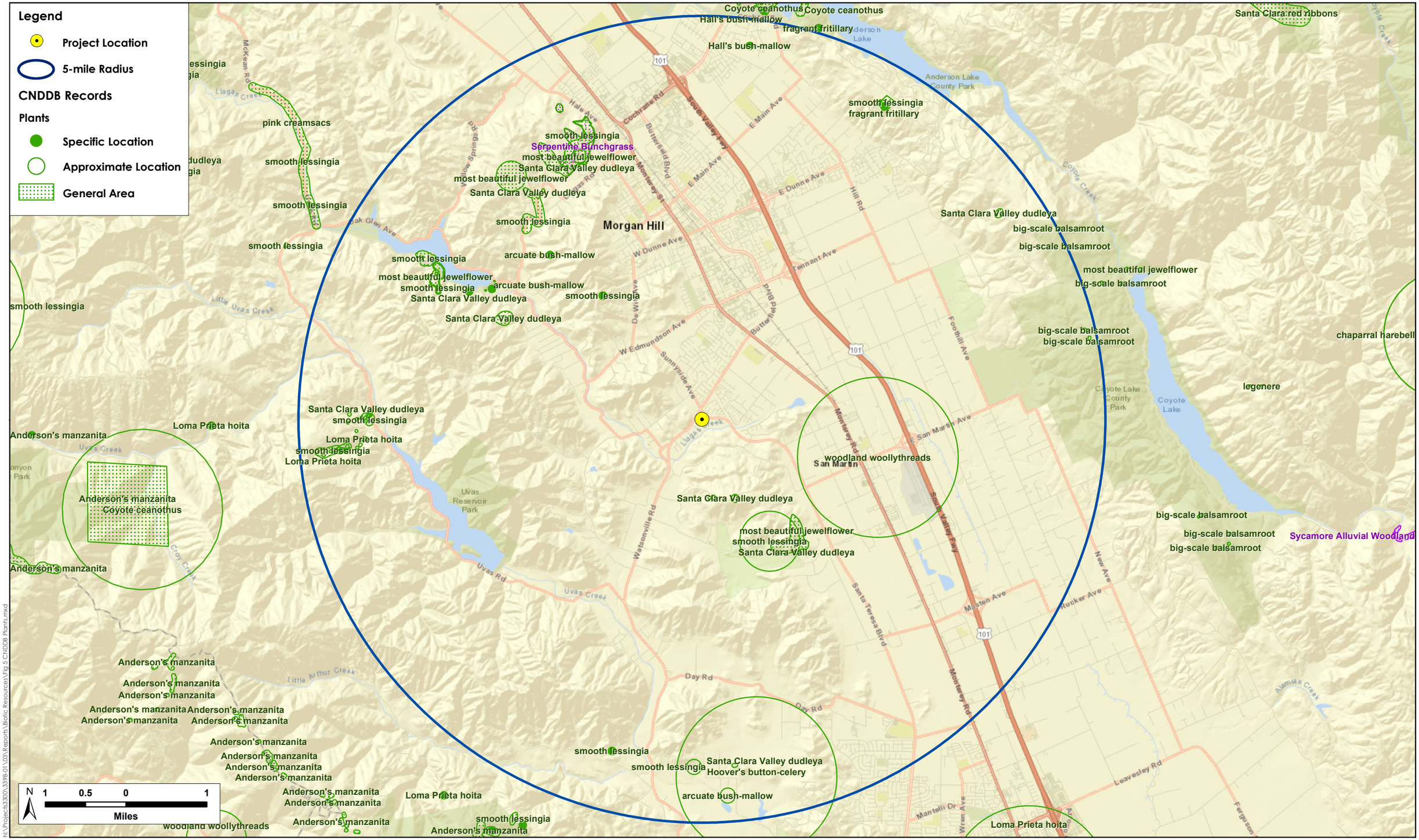
For purposes of this analysis, "special-status" plants are considered plant species that meet one or more of the following criteria:

- Listed under FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under CESA as threatened, endangered, rare, or a candidate species.
- Listed by the CNPS as CRPR 1A, 1B, 2, 3, or 4.

For purposes of this analysis, "special-status" animals are considered animal species that meet one or more of the following criteria:

- Listed under FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under CESA as threatened, endangered, or a candidate threatened or endangered species.
- Designated by the CDFW as a California species of special concern.
- Listed in the California Fish and Game Code as fully protected species (fully protected birds are provided in Section 3511, mammals in Section 4700, reptiles and amphibians in Section 5050, and fish in Section 5515).

Information concerning threatened, endangered, and other special-status species that potentially occur on the project site was collected from several sources and reviewed by H. T. Harvey & Associates biologists as described in Section 2.1 above. Figure 4 depicts CNDDB records of special-status plant species in the general vicinity of the project site and Figure 5 depicts CNDDB records of special-status animal species. These generalized maps show areas where special-status species are known to occur or have occurred historically.



N:\Projects\3300\3398-01\03\Reports\Biotic Resources\Fig 5 CNDDB Plants.mxd

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Figure 4. CNDDB-Mapped Records of Special-Status Plants
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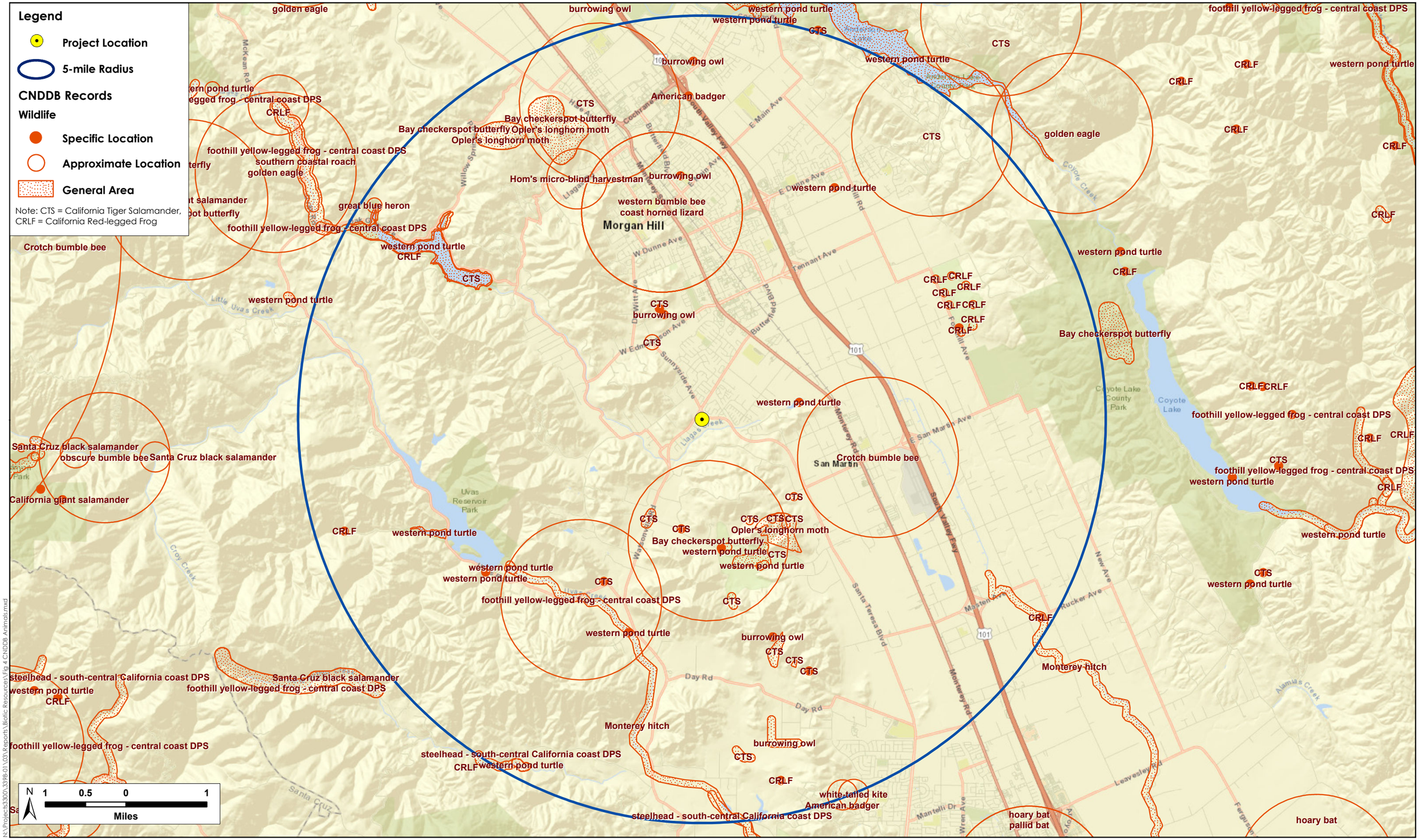

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Figure 5. CNDDB-Mapped Records of Special-Status Animals
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5.1 Special-Status Plant Species

The CNPS (2023) and CNDDB (2023) identify 76 special-status plant species that occur in Santa Clara County (for List 4 species) or in at least one of the nine quadrangles that contain or surround the project site (for List 1A, 1B, 2, or 3 species). Fifty-nine of these species were determined to be absent from the project site due to one or more of the following reasons: (1) lack of specific edaphic requirements such as serpentine soils, alkaline soils, and rock outcrops; (2) lack of suitable habitat types such as vernal pools, marshes and swamps, chaparral, coastal prairie, and coastal salt marsh; (3) the elevation range of the species is outside the range of the project site; or (4) the degraded habitat conditions on the project site are not likely to support the species in questions. Appendix A lists the plants that were rejected for consideration and the reasons for their rejection.

The remaining 17 plant species were further analyzed for their potential to occur on the project site (Table 1). The results of this analysis are discussed below and summarized in Table 1. Two of these special-status plant species, arcuate bush mallow (*Malacothamnus arcuatus*) and woodland woolythreads (*Monolopia gracilens*), are known to occur in the site vicinity (CNDDB 2023). However, after thorough analysis, these and all other special-status plant species were determined to be absent from the project site. The project site is not located within a VHP-mapped plant survey area.

5.2 Special-Status Animal Species

The legal status and likelihood of occurrence of special-status animal species known to occur, or potentially occurring, in the general Project vicinity are presented in Table 1. Several of the special-status species listed in Table 1 are not expected to occur on the project site because the site lacks suitable habitat, is outside the known range of the species, and/or is isolated from the nearest known extant populations by development or otherwise unsuitable habitat. For instance, the federally endangered Bay checkerspot butterfly (*Euphydryas editha bayensis*) is known to occur on serpentine habitats where its primary larval host plant (*Plantago erecta*) is present 1.5 mi to the south of the project site. However, the project site does not support any of the host plants required by this species, and is outside of the species' currently known distribution. Other animal species not expected to occur on the project site for the reasons outlined above include the western bumble bee (*Bombus occidentalis*), Monterey roach (*Lavinia symmetricus subditus*), California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii*), California tiger salamander (*Ambystoma californiense*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), least Bell's vireo (*Vireo bellii pusillus*), loggerhead shrike (*Lanius ludovicianus*), yellow-breasted chat (*Icteria virens*), tricolored blackbird (*Agelaius tricolor*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), San Joaquin kit fox (*Vulpes macrotis mutica*), American badger (*Taxidea taxus*), and Townsend's big-eared bat (*Corynorhinus townsendii*).

Several other special-status species are expected to occur on the project site only as uncommon to rare visitors, migrants, or transients. However, these species are not expected to breed on the project site in any numbers, or to be affected by project implementation. These include the monarch butterfly, long-eared owl (*Asio otus*), western red bat (*Lasiurus blossevillii*), pallid bat (*Antrozous pallidus*), and mountain lion.

Three other special-status wildlife species are known or expected to occur somewhat more regularly on or near the project site and may breed there. These are the South-Central California Coast steelhead, western pond turtle (*Actinemys marmorata*), white-tailed kite (*Elanus leucurus*), and yellow warbler (*Setophaga petechia*). There is also a very low probability of occurrence of Crotch's bumble bee on the project site due to the absence of high-quality floral resources, but occurrence (and possibly nesting) cannot be ruled out.

Table 1. Special-status Plant and Animal Species, Their Status, and Potential Occurrence in the Quail Vineyards Project Area

Name	*Status	Habitat	Potential for Occurrence on Site
Federal or State Endangered or Threatened Species			
Robust spineflower (*Chorizanthe robusta* var. *robusta*)	FE, CNPS List 1B.1	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub-sandy or gravelly.	**Absent.** Closest known extant occurrences are near Aptos, more than 10 mi from the project site. Presumed extirpated from Santa Clara County. Determined to be absent.
Monterey spineflower (*Chorizanthe pungens* var. *pungens*)	FT, CNPS List 1B.2	Chaparral (maritime), cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland/sandy.	**Absent.** Closest known extant occurrences are near Aptos, more than 10 mi from the project site. There are no occurrences from Santa Clara County. Determined to be absent.
Santa Cruz tarplant (*Holocarpha macradenia*)	FT, SE, CNPS List 1B.1	Coastal prairie, coastal scrub, valley and foothill grassland/often clay, sandy.	**Absent.** The only documented occurrences in the region are near Watsonville, more than 10 mi from the project site. The last remaining natural population in the San Francisco Bay Area was extirpated in 1993 (CNPS 2012). Determined to be absent.
Bay checkerspot butterfly (*Euphydryas editha bayensis*)	FT, VHP	Serpentine grasslands in the San Francisco Bay area where host plant (*Plantago erecta*) is present.	**Absent.** Bay checkerspot butterflies have been recorded in a limited area 1.5 mi to the south (CNDDB 2023); however, no suitable habitat and no host plants are present on the project site. Determined to be absent.
Monarch butterfly (*Danaus plexippus*)	FC	Requires milkweeds (*Asclepias* spp.) for egg-laying and larval development, but adults obtain nectar from a wide variety of flowering plants in many habitats. Individuals congregate in winter roosts, primarily in Mexico and in widely scattered locations on the central and southern California coast.	**Absent as Breeder.** No milkweed was detected on the project site, so no breeding habitat for this species is present. The monarch butterfly occurs throughout the region as a migrant, and small numbers of individuals may forage on the site, especially during spring and fall migration. However, the site does not provide high-quality foraging habitat for this species due to the limited flowering plants present. No current or historical overwintering sites are known in Santa Clara County.

Name	*Status	Habitat	Potential for Occurrence on Site
Western bumble bee (*Bombus occidentalis*)	SC	Occurs in a variety of grassland, scrub, and open woodland habitats.	**Absent.** Although the species was historically found throughout much of central and northern California, including the project vicinity, it has been extirpated from much of its former range, and there are no recent records from Santa Clara County or nearby areas (CDFW 2019, Bumble Bee Watch 2023, iNaturalist 2023). Therefore, this species is absent from the project site.
Crotch's bumble bee (*Bombus crotchii*)	SC	Open grassland and scrub habitats with abundant flowers providing nectar and pollen and with subterranean nest sites (such as animal burrows).	**May be Present.** Concern over possible population declines and range contractions led CDFW (2019) to consider this species a candidate for listing under CESA. However, since 2019, there have been documented occurrences of 70-80 individuals from nearly 20 locations in Santa Clara County (Bumble Bee Watch 2023, iNaturalist 2023, S. Rottenborn, pers. obs.), indicating that the species is still extant, and fairly widespread (albeit in low numbers in most locations) in the county. There is a 1959 CNDDB occurrence from San Martin, southeast of the site. The site lacks concentrations of high-quality floral resources for this species, which is therefore unlikely to occur. Nevertheless, it is possible that the species occasionally occurs (and may even nest) on the site.
South-Central California Coast steelhead (*Oncorhynchus mykiss*)	FT	Spawns in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating to the ocean.	**May be Present.** Known to occur in Llagas Creek historically (Smith 1982) and may still occur in wet years, though likely in limited numbers due to insufficient flows and long reaches of degraded habitat downstream that make it difficult for migrating steelhead to move between upper Llagas Creek and the Pajaro River (Spencer et al. 2006). The project site is within the portion of Llagas Creek that supports potential spawning habitat (Smith 2006).

Name	*Status	Habitat	Potential for Occurrence on Site
California tiger salamander (*Ambystoma californiense*)	FT, ST, VHP	Vernal or temporary pools in annual grasslands or open woodlands.	**Absent.** Suitable breeding habitat for tiger salamanders is not present on the project site. Tiger salamanders are known to occur 1.4 mi to the southeast (CNDDB 2023) of the project site and potential breeding ponds are located 0.65 mi to the south, between this population and the project site; however, substantial impediments to dispersal onto the site (in the form of low-density residential development, roads, and Llagas Creek) are present. Thus, this species is not expected to occur on the project site.
California red-legged frog (*Rana draytonii*)	FT, CSSC, VHP	Permanent and semi-permanent freshwater habitats, such as creeks and cold-water ponds, with emergent and submerged vegetation.	**Absent.** Suitable breeding habitat for red-legged frogs is not present on the project site. The nearest documented red-legged frog populations are 3.4 mi to the northwest (beyond the dispersal capabilities of the species) and 3.2 mi to the northeast on the other side of the Santa Clara valley floor across Highway 101 (CNDDB 2023), which precludes red-legged frog dispersal across the valley. Red-legged frogs have not been recorded in Llagas Creek near, or downstream from, the project site, and the abundance of non-native predators likely precludes the presence of a breeding population in this reach of the creek. The site is separated from any potential breeding ponds by impediments to dispersal (in the form of low-density residential development and roads). Therefore, red-legged frogs are not expected to occur on the project site.
Foothill yellow-legged frog (*Rana boylii*)	SE, FT, VHP	Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.	**Absent.** Although this species is present in less urbanized areas of Santa Clara County, it has disappeared from farmed and urbanized areas as well as many of the perennial streams below major reservoirs (H. T. Harvey & Associates 1999). Suitable habitat is not present on the project site.

Name	*Status	Habitat	Potential for Occurrence on Site
Southwestern pond turtle (*Emys pallida*)	CSSC, FC, VHP	Ponds, slow-moving streams and rivers, irrigation ditches, and reservoirs with abundant emergent and/or riparian vegetation.	**May be Present.** Pond turtles have been observed in Lake Silveira downstream from the project site. Turtles are unlikely to reside on the project site due to the lack of high-quality basking sites; however, turtles occasionally disperse through the project site, and the potential for individuals to nest in upland areas on the project site cannot be ruled out.
Bald eagle (*Haliaeetus leucocephalus*)	SE, SP	Occurs mainly along seacoasts, rivers, and lakes; nests in tall trees or in cliffs, occasionally on electrical towers. Feeds mostly on fish.	**Absent.** There is no suitable breeding or foraging habitat on or near the project site.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE, VHP	Nests in heterogeneous riparian habitat, often dominated by cottonwoods (*Populus* sp.) and willows.	**Absent.** There are only three records of the species in Santa Clara County, indicating that the County is not within the species' regular historical or current range. Although the VHP Geobrower (http://www.hcpmaps.com/habitat/) maps Llagas Creek along the edge of the project site as a least Bell's vireo survey area, the habitat on the project site is not consistent with the early-successional, willow-dominated habitat present at the locations of each of the County's three records. Determined to be absent.
Tricolored blackbird (*Agelaius tricolor*)	ST, VHP	Nests near fresh water in dense emergent vegetation.	**Absent.** No suitable habitat is present on or adjacent to the Project site. Although the VHP Geobrower (http://www.hcpmaps.com/habitat/) maps Llagas Creek along the edge of the project site as a tricolored blackbird survey area, this segment of creek does not provide suitable habitat due to the absence of emergent vegetation or other dense, low vegetation away from the mature riparian canopy (tricolored blackbirds do not nest in mature riparian woodland such as that on the project site). Determined to be absent.

Name	*Status	Habitat	Potential for Occurrence on Site
Mountain lion (*Puma concolor*)	SC	Occurs in a variety of habitats, typically remote from high levels of human activity in areas with good cover. May disperse through lower-quality habitat areas.	**Absent as Breeder.** Due to human activity, this species would not den on the project site, and it likely occurs in the project vicinity very infrequently, if at all. However, it is possible that the species could occasionally disperse into the site along Llagas Creek.
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, ST, VHP	Flat or gently sloping grasslands, mostly on the margins of the San Joaquin Valley and adjacent valleys.	**Absent.** There is no evidence of occurrence in or near the project site. Based on its current distribution and absence of high-quality habitat, this species is not expected to occur anywhere near the project site.
California Species of Special Concern			
Monterey roach (*Lavinia symmetricus subditus*)	CSSC	Fairly warm streams and rivers flowing into Monterey Bay.	**Absent.** Although historically present, roach have been absent from Llagas Creek downstream of Chesbro Reservoir since 1977 (Smith 1982, 2006).
Long-eared owl (*Asio otus*)	CSSC (nesting)	Riparian bottomlands with tall, dense willows and cottonwood stands (also dense live oak and California Bay along upland streams); forages primarily in adjacent open areas.	**Absent as Breeder.** Rare resident and occasional winter visitor in Santa Clara County. Historical breeding records are known from the Santa Clara Valley floor, but the species has not been recently recorded breeding away from montane areas. Expected to occur on the project site only as a rare transient or non-breeding forager, if at all.
Western burrowing owl (*Athene cunicularia*)	CSSC, VHP	Found in open, dry grasslands, deserts, and ruderal areas. Requires suitable small mammal burrows for shelter and nesting.	**Absent.** Suitable habitat is not present on the project site due to the abundance of trees, human disturbance, and lack of extensive grassland.
Loggerhead shrike (*Lanius ludovicianus*)	CSSC (nesting)	Grasslands, open woodlands, and other open areas featuring hunting perches and sharp branches or barbed wire for impaling prey items. Nests in dense patches of shrubbery.	**Absent.** Habitat on the project site is not suitable for nesting because of the density of trees and lack of suitably large, open grasslands or ruderal areas for foraging.

Name	*Status	Habitat	Potential for Occurrence on Site
Yellow warbler (*Setophaga petechia*)	CSSC (nesting)	Nests in dense stands of willow and other riparian habitat.	**May be Present.** Breeding yellow warblers have been confirmed upstream of the project site on Llagas Creek (Bousman 2007a), and it is possible that one or two pairs may nest in riparian habitat on the site itself. Yellow warblers occur on the project site as common transients during migration.
Yellow-breasted chat (*Icteria virens*)	CSSC (nesting)	Nests in dense stands of willow and other riparian habitat.	**Absent.** Although the species has been recorded along Llagas Creek just downstream of the project site (Bousman 2007b), it has not been confirmed breeding along upper Llagas Creek. The riparian habitat within the project site currently lacks the early successional willow habitat that chats prefer for breeding in Santa Clara County. Given the rarity of this species away from the few known breeding areas in eastern and southern Santa Clara County, yellow-breasted chats are unlikely to occur here even during migration.
Western red bat (*Lasiurus blossevillii*)	CSSC	Roosts in foliage in forest or woodlands, especially in or near riparian habitat.	**Absent as Breeder.** Occurs as a migrant and winter resident, but does not breed in the Project region. Small numbers may roost in foliage in trees on the project site, especially in riparian habitat along Llagas Creek.
Townsend's big-eared bat (*Corynorhinus townsendii*)	CSSC	Roosts primarily in caves, mines, attics, abandoned buildings and large trees with bowls such as found in burned old-growth redwoods Forages over many habitats.	**Absent.** Not expected to occur on the project site because of the lack of cavernous habitat (cave-like habitat including attics and abandoned buildings and sheds) and high level of human activity (species is very sensitive to disturbance).
Pallid bat (*Antrozous pallidus*)	CSSC	Forages over many habitats; roosts in buildings, large oaks or redwoods, rocky outcrops and rocky crevices in mines and caves.	**Absent as Breeder.** A focused search for pallid bat roosting habitat during the site visit located no suitable roosting habitat in the trees or two structures on site. Individuals from colonies located within several miles (mi) of the project site could potentially forage on the site in low numbers, though nothing about the site suggests that it provides particularly important foraging habitat for the species.

Name	*Status	Habitat	Potential for Occurrence on Site
San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)	CSSC	Builds nests in a variety of habitats including riparian areas, oak woodlands, and scrub.	**Absent.** Woodrat nests were not observed during focused surveys of the entire project site. Determined to be absent.
American badger (*Taxidea taxus*)	CSSC	Burrows in grasslands and occasionally in infrequently disked agricultural areas.	**Absent.** Suitably large expanses of open grassland habitat are not present on the project site. Determined to be absent.
State Fully Protected Species, CEQA Rare Species, and CNPS Species			
Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*)	CNPS List 1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub/sandy.	**Absent.** Closest known occurrences are near Aptos, more than 10 mi from the project site. There are no occurrences from Santa Clara County. Determined to be absent.
Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*)	CNPS List 4.3	Chaparral, cismontane woodland.	**Absent.** Closest known occurrence is more than 8 mi northeast of the project site. Grassland on-site is too degraded to provide habitat for this species. Determined to be absent.
Satan's goldenbush (*Isocoma menziesii* var. *diabolica*)	CNPS List 4.2	Cismontane woodland.	**Absent.** Only two records from Santa Clara County listed in Consortium of California Herbaria (CCH) database (2012), both are historical (1905 and 1955) and more than 20 mi from the project site. Determined to be absent.
Bristly leptosiphon (*Leptosiphon acicularis*)	CNPS List 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland.	**Absent.** Grassland and woodland habitat on site is too degraded to support species. Determined to be absent.
Large-flowered leptosiphon (*Leptosiphon grandiflorus*)	CNPS List 4.2	Coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland/usually sandy.	**Absent**. Only one historical (1922) record from the Project vicinity, approximately 5 mi south of the project site, listed in the CCH database (CCH 2023). Grassland on site is too degraded to support species. Determined to be absent.
Arcuate bush-mallow (*Malacothamnus arcuatus*)	CNPS List 1B.2	Chaparral, cismontane woodland.	**Absent.** CNDDB (2023) maps two records in the project vicinity, including one approximately 3 mi northwest of the project site. However, habitat quality on the Project site has been degraded due to cultivation and, as an evergreen shrub this species, this species would have been detectable during surveys in June. Determined to be absent.

Name	*Status	Habitat	Potential for Occurrence on Site
Mt. Diablo cottonweed (*Micropus amphibolus*)	CNPS List 3.2	Broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland/rocky.	**Absent.** Only one documented record (1961) from Santa Clara County in CCH database (CCH 2023), more than 15 mi north of project site, and suitable habitat is not present on the project site. Determined to be absent.
Woodland woolythreads (*Monolopia gracilens*)	CNPS List 1B.2	Openings in broadleafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest.	**Absent**. One historical (1901) record in CNDDB (2012) less than 3 mi east of the project site. However, there are no recent records and habitat on the site is too degraded to support this species. Determined to be absent.
Cotula navarretia (*Navarretia cotulifolia*)	CNPS List 4.2	Chaparral, cismontane woodland, valley and foothill grassland/adobe.	**Absent.** Habitat is too degraded to support this species. Determined to be absent.
Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*)	CNPS List 4.2	Broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools/vernally mesic.	**Absent.** Only one record from Santa Clara County in CCH database (CCH 2023), and suitable habitat is not present on the project site. Determined to be absent.
Monterey pine (*Pinus radiata*)	CNPS List 1B.1	Closed-cone coniferous forest, cismontane woodland.	**Absent.** Only three native stands exist in California, at Ano Nuevo, Cambria, and the Monterey Peninsula. This species has been widely introduced elsewhere and was planted on the project site, but is genetically distinct from the native stands.
Michael's rein orchid (*Piperia michaelii*)	CNPS List 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest.	**Absent.** Habitat is too degraded to support this species. Determined to be absent.
Chaparral ragwort (*Senecio aphanactis*)	CNPS List 2.2	Chaparral, cismontane woodland, coastal scrub.	**Absent.** Habitat is too degraded to support this species. Determined to be absent.
Santa Cruz clover (*Trifolium buckwestiorum*)	CNPS List 1B.1	Broadleafed upland forest, cismontane woodland, coastal prairie/gravelly, margins.	**Absent.** Only one record from the region, more than 10 mi west of the project site in the Santa Cruz Mountains (CNDDB 2023), and suitable habitat is not present on the project site. Determined to be absent.

Name	*Status	Habitat	Potential for Occurrence on Site
Golden eagle (*Aquila chrysaetos*)	SP	Breeds on cliffs or in large trees (rarely on electrical towers), forages in open areas.	**Absent.** Golden eagles may fly over the site on occasion, but the site provides insufficient open grassland or ruderal habitat to be used for foraging. The eucalyptus trees on the site are ostensibly suitable for use by nesting golden eagles. However, no nests have occurred in these trees, as evidenced by the long-term presence of the heron and egret rookery, which would not be active if golden eagles were nesting in these trees.
White-tailed kite (*Elanus leucurus*)	SP	Open habitats such as grassy plains, agricultural fields, open oak woodlands, and marshes. Nests in tall shrubs and trees.	**Present.** No nests observed on the project site; however, a pair of kites was observed foraging in the ruderal grassland/agricultural habitat during 2012 reconnaissance surveys. One pair of this species could potentially nest in trees on or adjacent to the site and forage on the site.

SPECIAL STATUS SPECIES CODE DESIGNATIONS

Status: Federally Endangered (FE); Federally Threatened (FT); Federal Candidate for Listing (FC); State Endangered (SE); State Threatened (ST); State Candidate for Listing (SC); State Fully Protected (SP); California Species of Special Concern (CSSC); Santa Clara Valley Habitat Plan Covered Species (VHP).

CNPS List 1B = Plants rare, threatened, or endangered in California and elsewhere
CNPS List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere
CNPS List 3 = Plants about which information is needed-a review list
CNPS List 4 = Plants of limited distribution-a watch list
.1 = seriously endangered in California
.2 = fairly endangered in California
.3 = not very endangered in California

5.3 Sensitive Natural Communities, Vegetation Alliances, and Habitats

CDFW ranks certain rare or threatened plant communities, such as wetlands, meadows, and riparian forest and scrub, as 'threatened' or 'very threatened'. These communities are tracked in the CNDDB. Impacts on CDFW sensitive plant communities, or any such community identified in local or regional plans, policies, and regulations, must be considered and evaluated under the CEQA (California Code of Regulations: Title 14, Div. 6, Chap. 3, Appendix G). Furthermore, wetland and riparian habitats are also afforded protection under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the USACE, RWQCB, CDFW, and/or the USFWS.

CDFW Sensitive Habitats. The only CDFW-regulated sensitive habitats on the site consist of the bed and banks of Llagas Creek, including the riparian woodland along the creek (to the outer drip line of the canopy).

Waters of the U.S./State. As discussed under *Regulatory Setting* above, the aquatic (extending up to the ordinary high water) habitat in Llagas Creek is considered waters of the U.S. under the Clean Water Act and Waters of the State under the Porter-Cologne Water Quality Control Act, and the RWQCB may also regulate the creek banks up to top of bank and out to the edge of the riparian canopy.

Section 6. Impacts and Mitigation Measures

CEQA and the State CEQA Guidelines provide guidance in evaluating impacts of projects on biological resources and determining which impacts will be significant. The Act defines "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project."

Appendix G of State CEQA Guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G (Chapter IV) may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would:

A. "have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service"

B. "have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service"

C. "Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means"

D. "interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites"

E. "conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance"

F. "conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan"

Potential impacts on biological resources as a result of the proposed project were systematically evaluated at the project level. These impacts were first evaluated to qualitatively describe how proposed project activities could impact biological resources, and whether impacts would be temporary (i.e., occurring only during project construction and the period immediately following) or permanent. Impacts were then evaluated with the application of any applicable VHP conditions (see below) with which the proposed project must comply to determine whether the impacts were significant (and thus required mitigation) even with VHP compliance.

6.1 Santa Clara Valley Habitat Plan

The proposed project is classified as an "Urban Development" project, which is a "covered project" under the VHP (ICF International 2012). Urban Development projects include private development projects within the planning limits of urban growth in Morgan Hill. The Santa Clara Valley Habitat Agency (SCVHA) leads the implementation of the VHP, which is a regional partnership between the CDFW, the USFWS, and six local partners, including Valley Water, the County of Santa Clara, the Santa Clara Valley Transportation Authority, and the Cities of San José, Gilroy, and Morgan Hill. The VHP was adopted in 2013 by all local participating agencies, and permits were issued from the USFWS and CDFW. The VHP is both a habitat conservation plan and natural community conservation plan, or HCP/NCCP. The planning document helps private and public entities plan and conduct projects and activities in ways that lessen impacts on natural resources, including specific threatened and endangered species. The VHP identifies regional lands (called reserves) to be preserved or restored to the benefit of at-risk species, and describes how reserves will be managed and monitored to ensure that they benefit those species. In providing a long-term, coordinated planning for habitat restoration and conservation, the VHP aims to enhance the viability of threatened and endangered species throughout the Santa Clara Valley.

The VHP defines measures to avoid, minimize, and mitigate impacts on covered species and their habitats while allowing for the implementation of certain *covered projects*. Chapter 6 of the VHP includes detailed and comprehensive conditions to avoid and minimize impacts on the 18 "covered species" (nine animal species and nine plant species) included in the plan area, which consists of 519,506 acres, or approximately 62% of Santa Clara County. These conditions are designed to achieve the following objectives:

- provide avoidance of certain covered species during implementation of covered activities throughout the project site;
- prevent take of individuals of certain covered species from covered activities as prohibited by law (e.g., take of fully protected species);
- minimize impacts on natural communities and covered species where conservation actions will take place; and
- avoid and minimize impacts on jurisdictional wetlands and waters throughout the project site to facilitate project-by-project wetland permitting.

In conformance with the VHP, project proponents are required to pay impact fees in accordance with the types and acreage of habitat or "land cover" impacted, and to implement conservation measures specified by the VHP. Land cover impacts are used because it is the best predictor of potential species habitat, and is applicable to all of the covered species (with the exception of the burrowing owl). The SCVHA has mapped the following three fee zones in the VHP area: (1) ranchland and natural lands, (2), agricultural and valley floor lands, and (3) small vacant sites. The following areas are exempt from land cover fees:

- all development that occurs on land mapped by the VHP as urban-suburban, landfill, reservoir (excluding dams), or agriculture developed land cover types;
- urban development in Fee Zones A–C on parcels less than 0.5 acre;
- additions to structures within 50 feet of an existing structure that result in less than 5,000 feet of impervious surface so long as there is no effect on wetland or serpentine land cover types; and
- construction of recreational facilities within the reserve system.

Additional fees in-lieu of providing compensatory mitigation are imposed for projects that impact serpentine habitat, wetlands, and burrowing owls, and for certain projects that result in atmospheric nitrogen emissions, although in some cases, project proponents may provide land to restore or create habitats protected by the VHP in lieu of payment of fees.

The project is located within the VHP Urban Service Area for the City of Morgan Hill. In regards to the VHP's land cover fee zones, the project footprint falls entirely within Fee Zone B (Agricultural and Valley Floor Lands) (Figure 6). The project will engender new vehicle trips associated with the 14 new residences and would therefore be required to pay fees for nitrogen emissions.

VHP conditions that apply to the proposed project are as follows:

Condition 1. Avoid Direct Impacts on Legally Protected Plant and Wildlife Species

Several wildlife species that occur in the project vicinity are protected under state and federal laws. Some of these animal species are listed as fully protected under the California Fish and Game Code (e.g., the white-tailed kite), and eagles are protected under the Bald and Golden Eagle Protection Act. Further, all native bird species and their nests are protected under the MBTA and California Fish and Game Code. Actions conducted under the VHP must comply with the provisions of the MBTA and California Fish and Game Code.

Condition 3. Maintain Hydrologic Conditions and Protect Water Quality

Condition 3 applies to all projects and identifies a set of programmatic BMPs, performance standards, and control measures to minimize increases of peak discharge of storm water and to reduce runoff of pollutants to protect water quality, including during project construction. These requirements include preconstruction, construction site, and post-construction actions. Preconstruction conditions are site design planning approaches that protect water quality by preventing and reducing the adverse impacts of stormwater pollutants and increases in peak runoff rate and volume. They include hydrologic source control measures that focus on the protection of natural resources. Construction site conditions include source and treatment control measure to prevent pollutants from leaving the construction site and minimizing site erosion and local stream sedimentation during construction. Post-construction conditions include measures for stormwater treatment and flow control.

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Figure 6. VHP Urban Service Area, Development Areas, and Fee Zones
Quail Vineyards Project - Biological Resources Report (3398-03)
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Condition 11. Stream and Riparian Setbacks

Condition 11 applies to covered projects that may affect streams and associated riparian vegetation within the VHP plan area. This condition requires new covered projects to adhere to setbacks from creeks and streams and associated riparian vegetation to minimize and avoid impacts on aquatic and riparian land cover types, covered species, and wildlife corridors. The standard required setback for the reach of Llagas Creek (a Category 1 stream) within the project site is 100 feet from the top of bank (because the slope of the project footprint is less than 30%) or 35 feet from the edge of riparian vegetation, whichever extends furthest landward. The riparian setback on the project site is dictated by the 100-foot buffer from the top of bank except in the northeast corner of the site, where a 35-foot buffer from the edge of riparian habitat dominates (Figure 7). The project has been designed so that all activities will occur outside the riparian setback except for the demolition of the existing residence, which is located in the setback.

Condition 16. Least Bell's Vireo

Condition 16 requires a habitat survey, preconstruction survey, and other measures for least Bell's vireos prior to work within 250 feet of habitat potentially suitable for the species. If a project is located within 250 feet of potential habitat as mapped by the VHP, a qualified biologist must conduct a field investigation to identify and map early successional riparian vegetation (typically dominated by willow shrubs and other thick understory vegetation). If suitable nesting habitat is identified, preconstruction surveys are necessary.

The habitat along Llagas Creek is mapped by the VHP Geobrower (http://www.hcpmaps.com/habitat/) as a least Bell's vireo survey area. Least Bell's vireos have not been recorded nesting on or near the project site. Per Condition 16, H. T. Harvey & Associates wildlife ecologist S. Rottenborn conducted a field investigation to identify and map potential nesting habitat for the least Bell's vireo on September 7, 2023. No suitable habitat is present on or within 250 feet of the project site. The riparian habitat along Llagas Creek consists of mature mixed riparian woodland and forest, lacking the early-successional vegetation favored by least Bell's vireos. Thus, no least Bell's vireos are expected to occur on or within 250 feet of the site, and no additional surveys or avoidance and minimization measures pertaining to this species are necessary.

Condition 17. Tricolored Blackbird

Condition 17 requires preconstruction surveys for tricolored blackbird prior to work within 250 feet of habitat potentially suitable for the species (and construction buffer zones, biological monitoring, and other requirements if nesting tricolored blackbirds are present). If a project is located within 250 feet of potential habitat as mapped by the VHP, a qualified biologist must conduct a field investigation to identify and map potential nesting substrate. If suitable nesting substrate is identified, avoidance and minimization measures must be implemented.

The habitat along Llagas Creek is mapped by the VHP Geobrower (http://www.hcpmaps.com/habitat/) as a tricolored blackbird survey area, but tricolored blackbirds have not been recorded nesting on or near the project

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Figure 7. Impacts Map
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site. Per Condition 17, H. T. Harvey & Associates wildlife ecologist S. Rottenborn conducted a field investigation to identify and map potential nesting substrate for tricolored blackbirds on September 7, 2023. No suitable vegetation for nesting by tricolored blackbirds was present along Llagas Creek within 250 feet of the project footprint due to the absence of emergent vegetation and the presence of a dense, mature tree canopy above the herbaceous vegetation along the creek. Thus, no tricolored blackbird nesting colonies are expected to occur on or within 250 feet of the site, and no additional surveys or avoidance and minimization measures pertaining to this species are necessary.

6.2 Impacts on Special-Status Species: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS (Less than Significant with Mitigation)

6.2.1 Impacts on Regionally Common Land Cover Types and Associated Common Plant and Wildlife Species (Less than Significant)

Proposed project activities would permanently impact 11.79 acres of orchard, 2.16 acres of California annual grassland, 1.12 acres of ornamental woodland, and 1.01 acres of urban-suburban land cover types (Figure 7). These impacts would reduce the extent of vegetation within the project area and would result in a reduction in abundance of some of the common plant and wildlife species that occur on the site. However, these land cover types have been subject to past disturbance associated with agricultural activities, and they do not provide regionally rare or especially high-value habitat for native vegetation or wildlife, or most special-status species. In addition, these land cover types are abundant and widespread regionally. Therefore, impacts on these upland habitats are considered less than significant. Further, because the number of individuals of any common plant or animal species within this habitat, and the proportion of these species' regional populations that could be disturbed, is very small, the project's impacts would not substantially reduce regional populations of these species. Thus, these impacts do not meet the CEQA standard of having a *substantial* adverse effect, and would not be considered significant under CEQA.

6.2.2 Impacts on Water Quality and Special-Status Fish (Less than Significant)

No direct impacts are proposed within the bed, banks, or riparian habitat along Llagas Creek, and no indirect impacts on the creek, water quality within the channel, or fish species inhabiting the river are expected to occur as a result of project activities. The project will maintain a setback of at least 100 feet from the top of bank. Additionally, the project will comply with all VHP conditions, including Condition 3, which requires implementation of design phase, construction phase, and post-construction phase measures, including programmatic BMPs, performance standards, and control measures, to minimize increases of peak discharge of storm water and to reduce runoff of pollutants to protect water quality, including during construction. Construction projects in California causing land disturbances that are equal to 1 acre or greater must comply

with state requirements to control the discharge of storm water pollutants under the NPDES *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit; Water Board Order No. 2009-0009-DWQ, as amended and administratively extended). Prior to the start of construction/demolition, a Notice of Intent must be filed with the SWRCB describing the project. A Storm Water Pollution Prevention Plan must be developed and maintained during the project and it must include the use of BMPs to protect water quality until the site is stabilized. Standard permit conditions under the Construction General Permit require that the applicant utilize various measures including: on-site sediment control BMPs, damp street sweeping, temporary cover of disturbed land surfaces to control erosion during construction, and utilization of stabilized construction entrances and/or wash racks, among other factors.

In many Bay Area counties, including Santa Clara County, projects must also comply with the California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Stormwater National Pollutant Discharge Elimination System Permit (Water Board Order No. R2-2015-0049). This permit requires that all projects implement BMPs and incorporate Low Impact Development practices into the design to prevent stormwater runoff pollution, promote infiltration, and hold/slow down the volume of water coming from a site after construction has been completed. In order to meet these permit and policy requirements, projects must incorporate the use of green roofs, impervious surfaces, tree planters, grassy swales, bioretention and/or detention basins, among other factors.

Given the project's design, compliance with VHP conditions, and compliance with stormwater permits, the project will not have a substantial impact on Llagas Creek, water quality, or special-status fish or other species within the creek.

6.2.3 Impacts on Nonbreeding Special-Status Invertebrates, Birds, and Mammals (Less than Significant)

Several special-status invertebrate, bird, and mammal species may occur within the project footprint as nonbreeding migrants, transients, or foragers, but they are not known or expected to breed or occur in large numbers within or near the project impact area. These are the monarch butterfly, long-eared owl, pallid bat, western red bat, and mountain lion. These species are not known or expected to breed on the project site or to occur in large numbers on the site. Activities under the proposed project would have some potential to impact foraging habitats and/or disturb individuals of these species. Construction activities might result in a temporary direct impact through the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during maintenance activities), but with the exception of pallid bat, construction would not result in the loss of individuals, as individuals of these species would fly away from any construction areas or equipment before they could be injured or killed. Although there is some potential for very low numbers of pallid bats to be lost if the old barn is demolished and pallid bats are present, there is a low probability that this species is present due to the lack of any evidence of roosting bats and the absence of high-quality roost sites. Further, the project footprint does not provide important foraging habitat used regularly or by large numbers of individuals of any of these species. As a result, impacts of the project will have little impact on these species'

foraging habitat and no substantive impact on regional populations of these species. Therefore, this impact would be less than significant.

6.2.4 Impacts on the Crotch's Bumble Bee, Southwestern Pond Turtle, Yellow Warbler, and White-Tailed Kite (Less than Significant)

One or two pairs of yellow warblers and one pair of white-tailed kites could potentially nest on or immediately adjacent to the project site. Although the project site does not provide high-quality habitat for the Crotch's bumble bee, there is at least a low potential for this species to nest on the site as well. It is also possible that southwestern pond turtles could occasionally nest on the project site, although due to the absence of high-quality basking sites from the reach of creek on the project site, turtle occurrence is expected to be infrequent, and nesting is therefore unlikely.

The project would result in the loss of potential nesting and foraging habitat for the Crotch's bumble bee; potential nesting habitat for the southwestern pond turtle; foraging habitat for the yellow warbler (no impacts on the yellow warbler's riparian nesting habitat will occur); and foraging and nesting habitat for the white-tailed kite.. Due to the very limited extent of habitat for these species that may be impacted by the project, relative to regionally available habitat, the loss of habitat for these species will not be substantial. Thus, these habitat impacts do not meet the CEQA standard of having a *substantial* adverse effect, and would not be considered significant under CEQA.

Vegetation removal or construction during the nesting season could potentially result in the loss or disturbance of active nests of the yellow warbler and white-tailed kite. Even if these species nest outside immediate impact areas, implementation of the proposed project could lead to increased disturbance near an active nest, which could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Because no more than one nesting pair of kites and 1-2 pairs of yellow warblers could be affected, the project's impacts would not substantially reduce regional populations of this species. Similarly, there is a very low probability that either Crotch's bumble bee or southwestern pond turtle nest on the project site due to the absence of high-quality floral resources for the bumble bee and basking sites for the turtle, which would thus reduce the likelihood that these species would spend time on or near the site. Thus, impacts on these potentially breeding species do not meet the CEQA standard of having a *substantial* adverse effect. Nevertheless, because the loss of any active nests of protected birds would be in violation of federal and state laws, measures to avoid such impacts will be implemented in compliance with VHP Condition 1, as described in Section 6.7 below.

Of the four species discussed in this impact, only the southwestern pond turtle is a covered species under the VHP (though the Crotch's bumble bee is proposed for addition as a covered species via the VHP amendment currently in progress). Nevertheless, compliance with VHP conditions would help reduce project impacts on all four of these species by reducing impacts to biological resources in general. In addition, these species will benefit from the VHP conservation program (i.e., the preservation, enhancement, and management of numerous habitat types throughout the VHP Reserve System) to which the project applicant would contribute via payment of VHP impact fees. As an NCCP, the VHP's reserve system will benefit whole communities of

plant and animal species in Santa Clara County, including many common and rare animal species. The reserve system will benefit the Crotch's bumble bee, yellow warbler, and white-tailed kite (in addition to the VHP-covered southwestern pond turtle) based on the relatively wide distribution of these species and their habitats in Santa Clara County, the known occurrence of these species on some existing reserves, and these species' expected occurrence on future acquisitions. Therefore, with the payment of VHP fees and compliance with the VHP's conditions, the potential loss of small numbers of individual Crotch's bumble bees, western pond turtles, yellow warblers, and white-tailed kites would not constitute a significant impact on these species under CEQA, in our opinion, because the VHP is expected to have a net benefit on the conservation of these species.

6.2.5 Impacts due to Increased Lighting (Less than Significant with Mitigation)

The project will result in the construction of buildings and roads that will increase the amount of lighting within and around the project footprint. Depending on the location, direction, and intensity of exterior lighting, this lighting can potentially spill into adjacent natural areas along Llagas Creek, thereby resulting in an increase in lighting compared to existing conditions. Many animals are sensitive to light cues, which influence their physiology and shape their behaviors, particularly during the breeding season (Ringer 1972, de Molenaar et al. 2006). Artificial light has been used as a means of manipulating breeding behavior and productivity in captive birds for decades (de Molenaar et al. 2006), and has been shown to influence the territorial singing behavior of wild birds (Longcore and Rich 2004, Miller 2006, de Molenaar et al. 2006). While it is difficult to extrapolate results of experiments on captive birds to wild populations, it is known that photoperiod (the relative amount of light and dark in a 24-hour period) is an essential cue triggering physiological processes as diverse as growth, metabolism, development, breeding behavior, and molting (de Molenaar et al. 2006). This holds true for birds, mammals (Beier 2006), and other taxa as well, suggesting that increases in ambient light may interfere with these processes across a wide range of species, resulting in impacts on wildlife populations. Artificial lighting may indirectly impact mammals and birds by increasing the nocturnal activity of predators like owls, hawks, and mammalian predators (Negro et al 2000, Longcore and Rich 2004, DeCandido and Allen 2006, Beier 2006). The presence of artificial light may also influence habitat use by rodents (Beier 2006) and by breeding birds (Rogers et al. 2006, de Molenaar et al. 2006), by causing avoidance of well-lit areas, resulting in a net loss of habitat availability and quality.

Wildlife species using Llagas Creek may be subject to increased predation, decreased habitat availability (for species that show aversions to increased lighting), reluctance to disperse through the project site, and alterations of physiological processes if development under the proposed project produces appreciably greater illuminance than the existing conditions. This impact on local wildlife populations is potentially significant under CEQA due to the high ecological value of the adjacent habitat area along Llagas Creek. Mitigation Measure BIO-1 below would minimize spillover of lighting as part of the project and would therefore reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1. Shield Exterior Lighting. To the extent consistent with the normal and expected operations of the project's residential uses, new lighting associated with the project shall be directed

away from Llagas Creek and/or shielded as needed to block illumination from shining upward, or outward toward Llagas Creek.

6.2.6 Nitrogen Emission Impacts on Serpentine Species and Communities (Less than Significant)

Some of the plant communities on hills surrounding the Santa Clara Valley grow on serpentine rock or soils derived from serpentine. Most soils derived from serpentine rock are highly infertile because of their extremely high levels of magnesium, chromium, and nickel; low concentrations of nutrients such as calcium and nitrogen; and low water-holding capacity. A unique group of vascular plant species that can tolerate these conditions has evolved in response to these conditions, whereas most nonnative plants, such as European grasses that dominate grassland throughout much of the region, cannot thrive on serpentine-derived soils. As a result, serpentine plant communities tend to be dominated by native species, including a number of special-status species. These include the federally endangered Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*), Metcalf Canyon jewel-flower (*Streptanthus glandulosus* ssp. *albidus*), and Coyote ceanothus (*Ceanothus ferrisiae*); the federally endangered and state threatened Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*); and a number of other rare plants, including Mt. Hamilton thistle (*Cirsium frontinale* var. *campylon*), fragrant fritillary (*Fritillaria liliacea*), most beautiful jewelflower (*Streptanthus glandulosus* ssp. *glandulosus*), smooth lessingia (*Lessingia micradenia* var. *glabrata*), and Loma Prieta hoita (*Hoita strobilina*). All of these species are covered plants under the VHP. In addition, the federally threatened and VHP-covered bay checkerspot butterfly (*Euphydryas editha bayensis*) relies on serpentine grasslands, which support its larval host plants dwarf plantain (*Plantago erecta*), dense-flowered owl's clover (*Castilleja densiflora*), and purple owl's clover (*Castilleja exserta*).

No serpentine plant communities or Bay checkerspot butterflies are present within the project area, and none will be directly impacted by the project. However, it is possible that the project could result in indirect impacts on serpentine communities off-site by releasing nitrogen compounds from equipment involved in project construction, and from vehicles of the new residents of the project. It has been demonstrated that the fertilization of serpentine grasslands with nitrogen allows some non-native grasses, particularly Italian rye grass, to be more competitive and become dominant, typically at the expense of native plants (Huenneke et al. 1990). Weiss (1999) described how moderate, well-managed grazing is necessary to prevent large-scale invasion of serpentine grassland by non-native grasses. In the absence of grazing, Bay checkerspot butterflies disappeared from ungrazed areas due to declines in densities of their larval host plants. Weiss (1999) further provided evidence that dry nitrogen deposition resulting from smog facilitates the invasion of serpentine grassland by non-native plants. As a result, the VHP concluded that increases in nitrogen emissions from increased traffic associated with development projects in the South Bay could adversely affect serpentine plant and animal communities.

Construction of the project will result in new vehicle trips associated with the 14 residences proposed by the project. These new vehicle trips will result in an increase in nitrogen emissions, which in turn will contribute to the effects of nitrogen deposition on the serpentine grassland ecosystem. To mitigate this impact, a conservation strategy in the VHP includes collection of fees within the VHP area based upon the generation of new vehicle

trips to fund acquisition and management of serpentine grasslands in the Coyote Ridge area and elsewhere in the foothills along the Santa Clara Valley. The goal of this strategy is to improve the viability of existing populations of the Bay checkerspot butterfly and rare plants, increase the number of populations, and expand the geographic distribution to ensure the long-term persistence of serpentine-associated species in the VHP area.

A nexus study was completed for the VHP to assist with identifying appropriate fees to fund measures in the VHP. The nitrogen deposition fee was calculated and adopted based on VHP costs related to mitigating the impacts of airborne nitrogen deposition from covered activities in the VHP area. The amount of the fee is based on the number of new daily vehicle trips generated by a covered activity. The fee-per-vehicle-trip is a surrogate that captures the overall effects of a project, recognizing that vehicle trips are not the only source of a project's nitrogen emissions. The project will be required to pay nitrogen deposition fees, which will then be used to fund the acquisition and management of habitat for the serpentine-associated species potentially impacted by nitrogen deposition. As a result, the project's nitrogen deposition impacts will be less than significant under CEQA.

6.3 Impacts on Sensitive Communities: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS (No Impact)

6.3.1 Impacts on Riparian Habitat or Other Sensitive Natural Communities (No Impact)

The CDFW defines sensitive natural communities and vegetation alliances using NatureServe's standard heritage program methodology (CDFW 2023), as described above in Section 5.3. Aquatic, wetland, and riparian habitats are also protected under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the USACE, RWQCB, CDFW, and/or the USFWS (see Section 6.4 below). Project impacts on sensitive natural communities, vegetation alliances/associations, or any such community identified in local or regional plans, policies, and regulations, were considered and evaluated.

Although sensitive riparian and aquatic habitat occur along Llagas Creek on the project site, the project will not impact these habitats. Furthermore, the project's developed areas will maintain a minimum 100-foot buffer from top of bank, and a buffer of at least 35 feet from the edge of the riparian canopy along Llagas Creek. Therefore, the proposed project will have no direct or indirect impacts on riparian habitat.

6.4 Impacts on Wetlands: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to,

marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (No Impact)

Wetlands and other waters of the U.S./state are present on the project site within the Llagas Creek corridor. The project design avoids all direct and indirect impacts on state or federally protected wetlands and aquatic habitats and maintains a buffer from such habitats as described in Section 6.3. Thus, no wetland or aquatic habitat will be impacted directly or indirectly by the project.

6.5 Impacts on Wildlife Movement: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (Less than Significant)

For many species, the landscape is a mosaic of suitable and unsuitable habitat types. Environmental corridors are segments of land that provide a link between these different habitats while also providing cover. Development that fragments natural habitats (i.e., breaks them into smaller, disjunct pieces) can have a twofold impact on wildlife: first, as habitat patches become smaller they are unable to support as many individuals (patch size); and second, the area between habitat patches may be unsuitable for wildlife species to traverse (connectivity).

Because the project site is located immediately outside of extensive, dense residential development in the City of Morgan Hill, wildlife such as mule deer, bobcats, coyotes, gray foxes, and possibly an occasional mountain lion moving around the outskirts of the City may occur on the project site. Although they may occur anywhere on the site, the dense vegetation of the Llagas Creek corridor provides the highest-quality cover for dispersing animals. A number of aquatic species, such as fish and amphibians, disperse along the creek, which provides a high-quality dispersal corridor.

Animal movement along Llagas Creek may be reduced somewhat following project construction as a result of the increase in human activity, noise, light, domestic animals, and other urban-related factors on the project site. However, the project will maintain a minimum 100-foot buffer from the top of bank along Llagas Creek, and a minimum buffer of 35 feet from the edge of the riparian canopy. These buffers will maintain an adequate corridor for wildlife movement along Llagas Creek, and impacts to wildlife movement will therefore be less than significant.

6.6 Impacts due to Conflicts with Local Policies: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Less than Significant)

6.6.1 Impacts Due to the Removal of Ordinance-Sized Trees (Less than Significant)

Implementation of the proposed project has potential to result in the removal of a small number of ordinance-sized trees that are present within the project footprint. The project proponent shall be required to submit a permit application for tree removal and comply with the conditions of the tree removal permit. As a result, any potential impacts related to conflict with local policies or ordinances protecting trees would be less than significant.

6.7 Impact due to Conflicts with an Adopted Habitat Conservation Plan: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan (Less Than Significant)

The City of Morgan Hill is a signatory to the VHP, which is a Habitat Conservation Plan and Natural Community Conservation Plan. As described in Section 6.1, the project is considered a "covered project" under the VHP. All VHP-covered species that may be affected by the proposed project are discussed in this report, including southwestern pond turtle (Section 6.2.4 above). The project applicant will apply for VHP coverage and will adhere to all applicable VHP Conditions during project implementation. Conditions applicable to the proposed project include Conditions 1 (avoid direct impacts to legally protected plant and wildlife species), 3 (maintain hydrologic conditions and protect water quality), 11 (stream and riparian setbacks), 16 (least Bell's vireo), and 17 (tricolored blackbird). Therefore, the proposed project would not be in conflict with the VHP.

The proposed project would not be in conflict with any other adopted habitat conservation plans or natural community conservation plans, or with any other approved local, regional, or state habitat conservation plans or natural community conservation plans. Thus, impacts associated with conflicts between the proposed project and any adopted habitat conservation plan or natural community conservation plan are less than significant.

Construction disturbance and project tree removal during the avian breeding season (February 1 through August 31 inclusive, for most species) could result in the incidental loss of eggs or nestlings, either directly through the destruction or disturbance of active nests or indirectly by causing the abandonment of nests. Because such an impact would conflict with Condition 1 of the VHP, it would be considered a significant impact under CEQA. Mitigation Measures BIO-2 and BIO-3 would be implemented to reduce impacts due to conflicts with Condition 1 of the VHP to a less-than-significant level.

Mitigation Measure BIO-2. Nesting-Season Avoidance. To the extent feasible, construction activities should be scheduled to avoid the nesting season. If construction activities are scheduled to take place outside the nesting season, all impacts to nesting birds protected under the MBTA and California Fish and Game Code would be avoided. The nesting season for most birds in Santa Clara County extends from February 1 through August 31, inclusive.

Mitigation Measure BIO-3. Preconstruction/Pre-disturbance Surveys and Buffers. If it is not possible to schedule construction activities and/or tree removal between September 1 and January 31, preconstruction surveys for nesting birds shall be conducted by a qualified ornithologist to ensure that no nests shall be disturbed during project implementation. These surveys shall be conducted no more than seven days prior to the initiation of demolition or construction activities, including tree removal and pruning. During this survey, the ornithologist shall inspect all trees and other potential nesting habitats (e.g., trees, shrubs, ruderal grasslands, buildings) in and immediately adjacent to the impact areas for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the ornithologist shall determine the extent of a construction-free buffer zone to be established around the nest (typically 300 feet for raptors and 100 feet for other species), to ensure that no nests of species protected by the MBTA and California Fish and Game Code shall be disturbed during project implementation.

6.8 Cumulative Impacts (Less than Significant)

Cumulative impacts arise due to the linking of impacts from past, current, and reasonably foreseeable future projects in the region. Future development activities in the City of Morgan Hill and surrounding areas of unincorporated Santa Clara County, and other development activities covered by the VHP, will result in impacts on the same habitat types and species that will be affected by the proposed project. The proposed project, in combination with other projects in the area and other activities that impact the habitats and species that are affected under the project, could contribute to cumulative effects on special-status species. Other projects in the area include both development and maintenance projects that could adversely affect these species and restoration projects that will benefit these species.

The cumulative impact on biological resources resulting from the project in combination with other projects in the region would be dependent on the relative magnitude of adverse effects of these projects on biological resources compared to the relative benefit of impact avoidance and minimization efforts prescribed by planning documents, CEQA mitigation measures, and permit requirements for each project; compensatory mitigation and proactive conservation measures associated with each project, and the benefits to biological resources accruing from the VHP. In the absence of such avoidance, minimization, compensatory mitigation, and conservation measures, cumulatively significant impacts on biological resources would occur.

However, the VHP includes numerous conservation measures to offset adverse effects on covered activities. Many projects in the region that impact resources similar to those impacted by the proposed project will be covered activities under the VHP and will mitigate impacts on sensitive habitats and many special-status species

through that program, which will require payment of fees for habitat restoration. Further, the project would implement BMPs and mitigation measures to reduce impacts on both common and special-status species, as described above. Provided that this project successfully incorporates the mitigation measures described in this biological resources report, the project will not contribute to substantial cumulative effects on biological resources.

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Appendix A. Special-Status Plant Species Considered but Rejected for Occurrence on the Project Site

Scientific Name	Common Name	Habitat	Lack of Alkaline (A) or Serpentine (S) Soils	Habitat Type Not Present On-site	Out of Elevation Range	Habitat On-site Too Degraded to Support
Acanthomintha lanceolata	Santa Clara thorn-mint	Serpentine soils in chaparral, cismontane woodland, and coastal scrub, 260 to 3900 ft.	S			X
Androsace elongata ssp. *acuta*	California androsace	Dry, grassy slopes in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland, 490 to 3900 ft.			X	X
Arctostaphylos andersonii	Anderson's manzanita	Openings in broadleafed forest, chaparral, and North Coast coniferous forest, 200 to 2500 ft.		X		
Arctostaphylos pajaroensis	Pajaro manzanita	Sandy soils in chaparral, 100 to 2500 ft.		X		
Arctostaphylos regismontana	Kings Mountain manzanita	Granitic or sandstone substrates in broadleaved upland forest, north coast coniferous forest, and chaparral, 1000 to 2400 ft.		X	X	
Azolla microphylla	Mexican mosquito fern	Ponds, marshes, and swamps, 100 to 330 ft.		X	X	
Balsamorhiza macrolepsis	Big-scale balsamroot	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite, 300 to 5100 ft.				X
Calandrinia breweri	Brewer's calandrinia	Sandy or loamy soils in chaparral and coastal scrub, 30 to 4000 ft.		X		
Calochortus umbellatus	Oakland star-tulip	Serpentine soils in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland, 330 to 2300 ft.	S			X
Calyptridium parryi var. *hesseae*	Santa Cruz Mountains pussypaws	Sandy or gravelly openings in chaparral and cismontane woodland, 1000 to 4900 ft.			X	X
Calystegia collina ssp. *venusta*	South Coast Range morning-glory	Serpentine or sedimentary soils in chaparral, cismontane woodland, and valley and foothill grassland, 1400 to 4900 ft.	S		X	X
Castilleja affinis ssp. *neglecta*	Tiburon paintbrush	Serpentine soils in valley and foothill grassland, 200 to 1300 ft.	S			X

Scientific Name	Common Name	Habitat	Lack of Alkaline (A) or Serpentine (S) Soils	Habitat Type Not Present On-site	Out of Elevation Range	Habitat On-site Too Degraded to Support
Castilleja rubicundula ssp. *rubicundula*	pink creamsacs	Serpentine soils in openings in chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland, 70 to 3000 ft.	S			X
Ceanothus ferrisiae	Coyote ceanothus	Serpentine soils in chaparral, coastal scrub, and valley and foothill grassland, 390 to 1500 ft.	S		X	X
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	Alkaline soils in valley and foothill grassland, 0 to 750 ft.	A			X
Cirsium fontinale var. *campylon*	Mt. Hamilton fountain thistle	Serpentine soils in broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub, 330 to 2900 ft.	S			
Clarkia breweri	Brewer's clarkia	Serpentine soils in openings of chaparral, cismontane woodland, and coastal scrub, 710 to 3700 ft.	S		X	X
Collinsia multicolor	San Francisco collinsia	Serpentine soils in closed-cone coniferous forest and coastal scrub, 100 to 820 ft.	S	X		
Cypripedium fasciculatum	clustered lady's-slipper	Serpentine soils in lower montane coniferous forest and North Coast coniferous forest, 330 to 8000 ft.	S	X		
Dudleya abramsii ssp. *setchellii*	Santa Clara Valley dudleya	Serpentinite and rocky outcrops in cismontane woodland, and valley and foothill grassland, 200 to 1500 ft.	S			X
Eriogonum argillosum	clay buckwheat	Serpentine or clay soils in cismontane woodland, 490 to 2600 ft.	S		X	X
Eriogonum umbellatum var. *bahiiforme*	bay buckwheat	Rocky, serpentine soils in lower montane forest and cismontane woodland, 2300 to 7200 ft.	S		X	X
Eriophyllum jepsonii	Jepson's woolly sunflower	Serpentine soils in coastal scrub, chaparral, and cismontane woodland, 660 to 3400 ft.	S	X	X	X
Erysimum ammophilum	sand-loving wallflower	Sandy soils in openings in chaparral, coastal dunes, and coastal scrub, 0 to 200 ft.		X	X	
Erysimum franciscanum	San Francisco wallflower	Serpentine or granitic substrates in chaparral, coastal dunes, coastal scrub, and valley and foothill grassland, 0 to 1800 ft.	S			X
Fritillaria agrestis	stinkbells	Clay or serpentine soils in chaparral, oak woodland and grassland, 30 to 5100 ft.	S			X

Scientific Name	Common Name	Habitat	Lack of Alkaline (A) or Serpentine (S) Soils	Habitat Type Not Present On-site	Out of Elevation Range	Habitat On-site Too Degraded to Support
Fritillaria liliacea	fragrant fritillary	Serpentine soils in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, 10 to 1300 ft.	S			X
Galium andrewsii ssp. *gatense*	phlox-leaf serpentine bedstraw	Rocky, serpentine substrates in chaparral, cismontane woodland, and lower montane coniferous forest, 490 to 4800 ft.	S		X	X
Gilia tenuiflora ssp. *arenaria*	Monterey gilia	Sandy opening ins in maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub, 0 to 150 ft.			X	X
Helianthus exilis	serpentine sunflower	Serpentine soils in chaparral and cismontane woodland, 490 to 5000 ft.	S		X	X
Hoita strobilina	Loma Prieta hoita	Serpentine soils in chaparral, cismontane woodland, and riparian woodland, 100 to 2800 ft.	S			X
Horkelia cuneata var. *sericea*	Kellogg's horkelia	Sandy or gravelly soils in chaparral, cismontane woodland, and coastal scrub, 30 to 660 ft.		X		X
Iris longipetala	coast iris	Coastal prairie, lower montane coniferous forest, and meadows and seeps, 0 to 2000 ft.		X		
Legenere limosa	legenere	Vernal pools, 3 to 2900 ft.		X		
Leptosiphon ambiguus	serpentine leptosiphon	Serpentine soils in cismontane woodland, coastal scrub, and valley and foothill grassland, 390 to 3700 ft.	S		X	X
Lessingia hololeuca	woolly-headed lessingia	Clay or serpentine soils in broadleaf upland forest, coastal scrub, coniferous forest, and grassland, 45 to 900 ft.	S			X
Lessingia micradenia var. *glabrata*	smooth lessingia	Serpentine soil outcrops in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland, 390 to 1400 ft.	S		X	X
Lessingia tenuis	spring lessingia	Openings in chaparral, cismontane woodland, and lower montane coniferous forest, 980 to 7100 ft.			X	X
Malacothamnus aboriginum	Indian Valley bush-mallow	Rocky granitic soils in chaparral and cismontane woodland, 490 to 5600 ft.			X	X
Malacothamnus hallii	Hall's bush-mallow	Chaparral and coastal scrub, 30 to 2500 ft.		X		

Scientific Name	Common Name	Habitat	Lack of Alkaline (A) or Serpentine (S) Soils	Habitat Type Not Present On-site	Out of Elevation Range	Habitat On-site Too Degraded to Support
Malacothrix phaeocarpa	dusky-fruited malacothrix	Openings in closed cone coniferous forest and chaparral, 330 to 4600 ft.		X		
Microseris sylvatica	sylvan microseris	Serpentine soils in chaparral, cismontane woodland, Great Basin scrub, pinyon and juniper woodland, and valley and foothill grassland, 150 to 4900 ft.	S			X
Monardella antonina ssp. *antonina*	San Antonio Hills monardella	Chaparral and cismontane woodland, 1600 to 3300 ft.			X	X
Monolopia gracilens	woodland woolythreads	Openings in broadleafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest, 330 to 3900 ft.	S			X
Penstemon rattanii var. *kleei*	Santa Cruz Mountains beardtongue	Chaparral, lower montane coniferous forest, and North Coast coniferous forest, 1300 to 3600 ft.		X	X	
Piperia leptopetala	narrow-petaled rein orchid	Cismontane woodland, lower montane coniferous forest, and upper montane coniferous forest, 1250 to 7300 ft.			X	X
Piperia yadonii	Yadon's rein orchid	Coastal bluff scrub, closed-cone coniferous forest, and chaparral, 30 to 1700 ft.		X		
Plagiobothrys chorisianus var. *chorisianus*	Choris' popcorn-flower	Mesic sites in chaparral, coastal prairie, and coastal scrub, 50 to 530 ft.		X		
Plagiobothrys chorisianus var. *hickmanii*	Hickman's popcorn-flower	Mesic sites in chaparral, coastal scrub, and closed cone coniferous forest, 50 to 610 ft.		X		
Plagiobothrys myosotoides	forget-me-not popcorn-flower	Chaparral, 1600 to 6600 ft.		X	X	
Psilocarphus brevissimus var. *multiflorus*	Delta woolly-marbles	Vernal pools and flats, 30 to 1600 ft.		X		
Sanicula saxatilis	rock sanicle	Rocky soils in broadleafed upland forest, chaparral, and valley and foothill grassland, 2000 to 3900 ft.			X	X
Sidalcea malachroides	maple-leaved checkerbloom	Near the coast in broadleafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, and riparian woodlands, 7 to 2400 ft.		X		X
Streptanthus albidus ssp. *albidus*	Metcalf Canyon jewel-flower	Serpentine soils in valley and foothill grassland, 150 to 2600 ft.	S			X

Scientific Name	Common Name	Habitat	Lack of Alkaline (A) or Serpentine (S) Soils	Habitat Type Not Present On-site	Out of Elevation Range	Habitat On-site Too Degraded to Support
Streptanthus albidus ssp. *peramoenus*	most beautiful jewel-flower	Serpentine soils and serpentinite rock outcrops in chaparral, cismontane woodland, and valley and foothill grassland, 310 to 3300 ft.	S			X
Streptanthus callistus	Mt. Hamilton jewel-flower	Chaparral and cismontane woodland, 2000 to 2600 ft.			X	X
Stuckenia filiformis	slender-leaved pondweed	Marshes and swamps, 980 to 7100 ft.		X	X	
Trifolium amoenum	two-fork clover	Sometime serpentine soils in coastal bluff, and valley and foothill grassland, 20 to 1400 ft.	S			X
Trifolium hydrophilum	saline clover	Alkaline or saline soils in marshes and swamps, and valley and foothill grassland, 0 to 980 ft.	A			X

Appendix B. Plant Species Observed on the Project Site

Family Name	Scientific Name	Common Name
Adoxaceae	*Sambucus nigra*	black elderberry
Anacardiaceae	*Toxicodendron diversilobum*	poison oak
Apiaceae	*Conium maculatum*	poison hemlock
Apiaceae	*Torilis nodosa*	knotted hedgeparsley
Apocynaceae	*Nerium oleander*	oleander
Asteraceae	*Anthemis cotula*	mayweed
	Artemisia douglasiana	California mugwort
	Baccharis pilularis	Coyote brush
	Carduus pycnocephalus	Italian thistle
	Hypochaeris radiata	catsear
	Lactuca serriola	prickly lettuce
	Helminthotheca echiodes	bristly ox-tongue
	Taraxacum officinale	dandelion
	Tragopogon porrifolius	salsify
Brassicaceae	*Brassica nigra*	black mustard
	Hirschfeldia incana	shortpod mustard
	Raphanus sativus	wild radish
Convolvulaceae	*Convolvulus arvensis*	bindweed
Cucorbitaceae	*Marah fabacea*	California man-root
Cupressaceae	*Calocedrus decurrens*	incense cedar
	Sequoia sempervirens	redwood
Euphorbiaceae	*Euphorbia peplus*	petty spurge
Fabaceae	*Acacia sp.*	acacia
	Genista monspessulana	French broom
	Medicago polymorpha	burclover
Fagaceae	*Quercus agrifolia*	coast live oak
	Quercus lobata	valley oak
Geraniaceae	*Erodium botrys*	broad leaf filaree
	Erodium cicutarium	red stem filaree
Juglandaceae	*Carya sp.*	pecan
	Juglans hindsii	black walnut
	Juglans regia	English walnut
Myrtaceae	*Eucalyptus globulus*	blue gum
Oleaceae	*Fraxinus velutina*	Modesto ash
Pinaceae	*Cedrus deodara*	Himalayan cedar
	Pinus muricata	Bishop pine

Family Name	Scientific Name	Common Name
	Pinus radiata	Monterey pine
	Pseudotsuga menziesii	Douglas fir
Plantaginaceae	*Plantago lanceolata*	English plantain
Platanaceae	*Platanus racemosa*	sycamore
Poaceae	*Avena barbata*	slender wild oats
	Avena fatua	wild oats
	Bromus catharticus	rescue grass
	Bromus diandrus	ripgut brome
	Bromus hordeaceus	soft brome
	Elymus glaucus	blue wildrye
	Hordeum murinum	foxtail barley
	Lolium multiflorum	Italian ryegrass
	Piptatherum miliaceum	smilograss
Rosaceae	*Rubus armeniacus*	Himalayan blackberry
Rubiaceae	*Galium aparine*	bedstraw
Salicaceae	*Salix laevigata*	red willow
	Salix lasiolepis	arroyo willow

The species are arranged alphabetically by family name for all vascular plants encountered during the plant survey. Plants are also listed alphabetically within each family. Species nomenclature is from Baldwin *et al.* (2012).

Appendix C

Arborist Report

License WE-13625A ~ Arborist #WE-6620A ~ Insured PL/PD ~ Workers Compensation ~ 408-722-8942 ~ arborist@garlic.com **~** moki@smithtreespecialists.com

Doug Blackwell
14905 Santa Teresa Boulevard
Morgan Hill CA, 95037
(408) 892-8345
dblackwell@garlic.com

June 25, 2022

As per your request I visited the site on June 24, 2022. I have updated the details about the size, health, and existence of the trees that were included in your previous inventory. Some of the trees on the old report are no longer existing or could not be located. Tree numbers: 19, 20, and 21 are no longer in existence.

The details displayed below are the updated details of every tree that was in the previous report with updated tag numbers. The old tags have been replaced because most of them were non existing or impossible to read.

I recommend tree tag number 4127 for removal due to poor health and structural defects.

We appreciate the opportunity to provide this inventory and comments and look forward to working with you further on this project.

Please feel free to call for further clarification.

Respectfully submitted,

William Smith

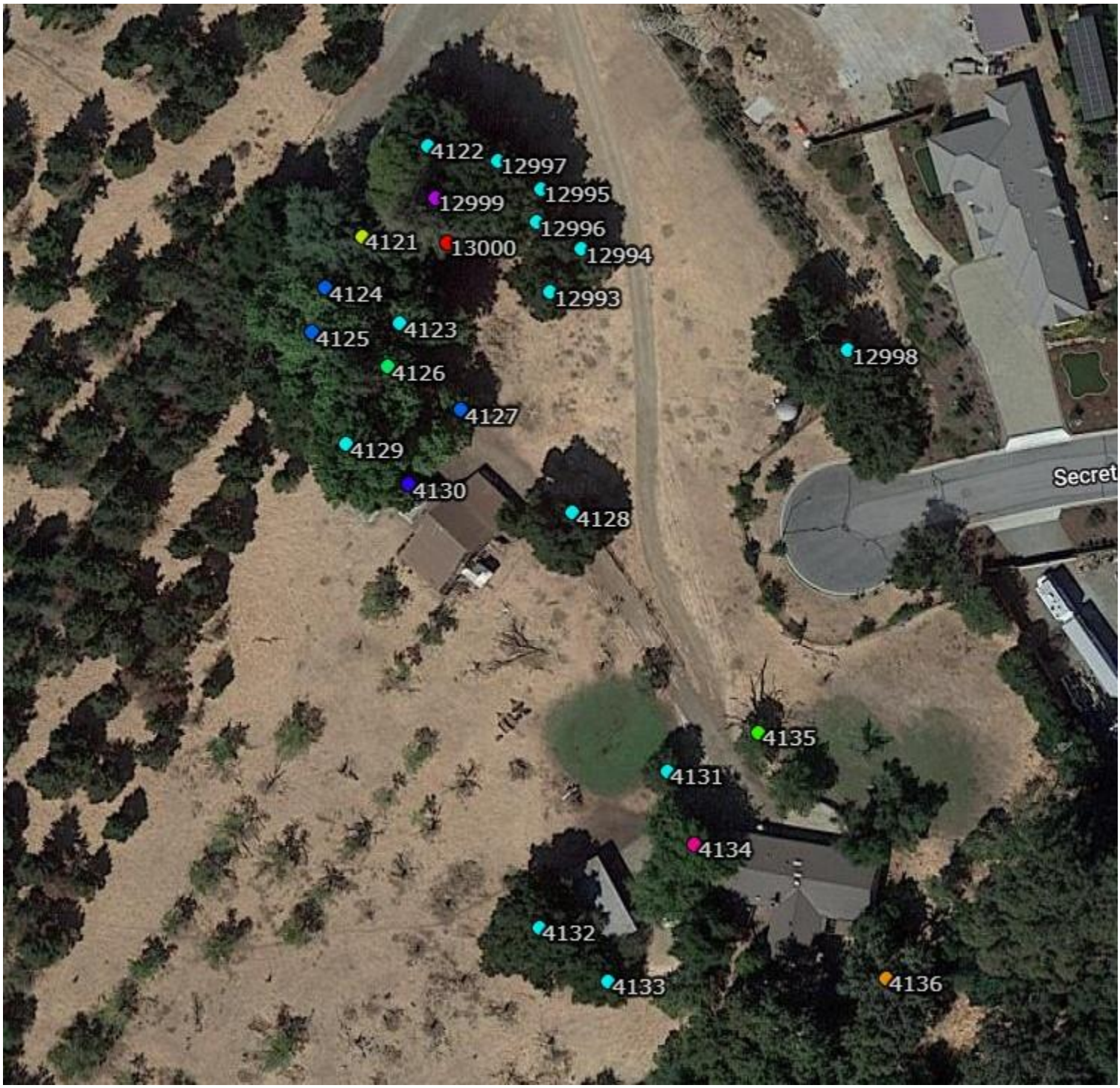
William Smith
Arborist #WE-13625A
Smith Tree Specialists, Inc

Inventory:

Doug Blackwell
14905 Santa Teresa Boulevard,
Morgan Hill CA, 95037

Tree Id #	Common Name	*Species*	D.B.H.	Height	Canopy	Condition
12993	Live oak	*Quercus virginiana*	21"	45'	35'	Good
12994	Live oak	*Quercus virginiana*	22"	45'	30'	Good
12995	Live oak	*Quercus virginiana*	16"	40'	25'	Fair
12996	Live oak	*Quercus virginiana*	28"	55'	45'	Good
12997	Live oak	*Quercus virginiana*	24"	60'	40'	Fair
12998	Live oak	*Quercus virginiana*	24"	45'	35'	Good
12999	Bottle tree	*Callistemon viminalis*	35"	55'	45'	Fair
13000	Coastal redwood	*Sequoia sempervirens*	54"	100'	40'	Fair
4121	Deodar cedar	*Cedrus deodara*	39"	60'	50'	Fair
4122	Live oak	*Quercus virginiana*	25"	50'	35'	Fair
4123	Live oak	*Quercus virginiana*	38"	55'	45'	Fair
4124	Modesto ash	*Fraxinus velutina*	28"	75'	50'	Fair
4125	Modesto ash	*Fraxinus velutina*	27"	65'	45'	Fair
4126	Incense cedar	*Calocedrus decurrens*	36"	80'	45'	Good
4127	Modesto ash	*Fraxinus velutina*	31"	56'	60'	Poor
4128	Live oak	*Quercus virginiana*	32"	50'	50'	Excellent
4129	Live oak	*Quercus virginiana*	27"	60'	50'	Fair
4130	Pecan	*Carya illinoinesis*	26"	60'	60'	Poor
4131	Live oak	*Quercus virginiana*	17"	20'	15'	Good
4132	Live oak	*Quercus virginiana*	31"	40'	50'	Excellent
4133	Live oak	*Quercus virginiana*	31"	30'	20'	Fair
4134	Fruitless mulberry	*Morus alba*	23"	25'	35'	Good
4135	English walnut	*Juglans regia*	42"	40'	30'	Poor
4136	Coastal live oak	*Quercus agrifolia*	27"	65'	40'	Fair

Doug Blackwell
14905 Santa Teresa Boulevard,
Morgan Hill CA, 95037



Appendix D

Historic Resource Evaluation

EVANS & DE SHAZO
ARCHAEOLOGY HISTORIC PRESERVATION

A HISTORIC RESOURCE EVALUATION FOR THE BLACKROCK (QUAIL VINEYARDS) PROJECT AT 14905 SANTA TERESA BOULEVARD, MORGAN HILL, SANTA CLARA COUNTY, CALIFORNIA

SUBMITTED TO:

Nick Pappani
Raney Planning & Management, Inc.
1501 Sports Drives, Suite A
Sacramento, CA 95834

SUBMITTED BY:

Stacey De Shazo, M.A.
Principal Architectural Historian,
Nicole LaRochelle, M.S., and Bee Thao, M.A.

April 5, 2024

Evans & De Shazo, Inc
1141 Gravenstein Highway S
Sebastopol, CA 95472
707-823-7400
www.evans-deshazo.com

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INTRODUCTION

Evans & De Shazo, Inc. (EDS) completed a Historic Resource Evaluation (HRE) for the property at 14905 Santa Teresa Boulevard, Morgan Hill, Santa Clara County, within the 17.89-acre Assessor Parcel Number (APN) 779-02-023 (Project Area). The Project Area consists of a ca. 1883 barn,[1] a 1966 house, a ca. 1955 detached garage, and associated landscape. The proposed project comprises subdividing the 17.89-acre property into 14 single-family and creating two new roads, extending Secretariat Way and Court A. None of the built environment resources within the Project Area are currently listed on the Office of Historic Preservation (OHP) Built Environment Resources Directory (BERD); however, the ca. 1883 "Barney Machado Barn" is currently listed within the County of Santa Clara Heritage Resource Inventory List (also known as the Heritage Resource Inventory list; updated May 16, 2023).[2] [3] Therefore, the barn is currently considered a historical resource in accordance with the California Environmental Quality Act (CEQA) regulations (PRC § 21000 et seq.) and guidelines (14 CCR § 15000 et seq.). However, due to discrepancies in the previous documentation of the ca. 1883 barn, including the date and ownership history, and to determine if the 1966 house, ca. 1955 detached garage, and associated landscape are considered historical resources for the purposes of CEQA, the City of Morgan Hill requested an updated HRE of the ca. 1883 barn and an HRE of the 1966 house, ca. 1955 detached garage, and associated landscape to determine if any of the built environment resources are eligible for listing on the California Register of Historical Resources (CRHR) and provide recommendations as warranted. Department of Parks and Recreation (DPR) 523 forms were also completed.

The HRE follows CEQA regulations (PRC § 21084.1) and guidelines (14 CCR § 15064.5) pertaining to cultural resources. The HRE and DPR 523 forms were completed by EDS Principal Architectural Historian Stacey De Shazo, M.A. and Architectural Historian Nicole La Rochelle, M.S., both of whom exceed the Secretary of the Interior's qualification standards in Architectural History and History, with research assistance by Bee Thao, M.A. in Cultural Resource Management. The methods used to complete the HRE included a record search, literature review, and a historic architectural survey to document the built environment resources within the Project Area and identify any architectural styles, forms, materials, character-defining features, and alterations associated with the built environment. The results are presented herein.

PROJECT LOCATION

The 17.89-acre Project Area (APN 779-02-023) is located at 14905 Santa Teresa Boulevard, Morgan Hill, Santa Clara County, California (Figure 1). The Project Area is bound by Watsonville Road on the northwest, Santa Teresa Boulevard on the northeast, and Llagas Creek on the southeast. It is approximately 1.96 miles northeast of Highway 101.

[1] The date and original ownership of the barn within the Project Area have been updated based on this HRE.

[2] County of Santa Clara "Historic Preservation – Heritage Resource Inventory Update", https://plandev.sccgov.org/policies-programs/historic-preservation, accessed 2/12/2024.

[3] The County of Santa Clara Heritage Resource Inventory began as a preliminary survey of "Historical Landmarks" in 1962. Earlier versions were updated in 1975, 1979, and in 1999. The current version is dated May 16, 2023.

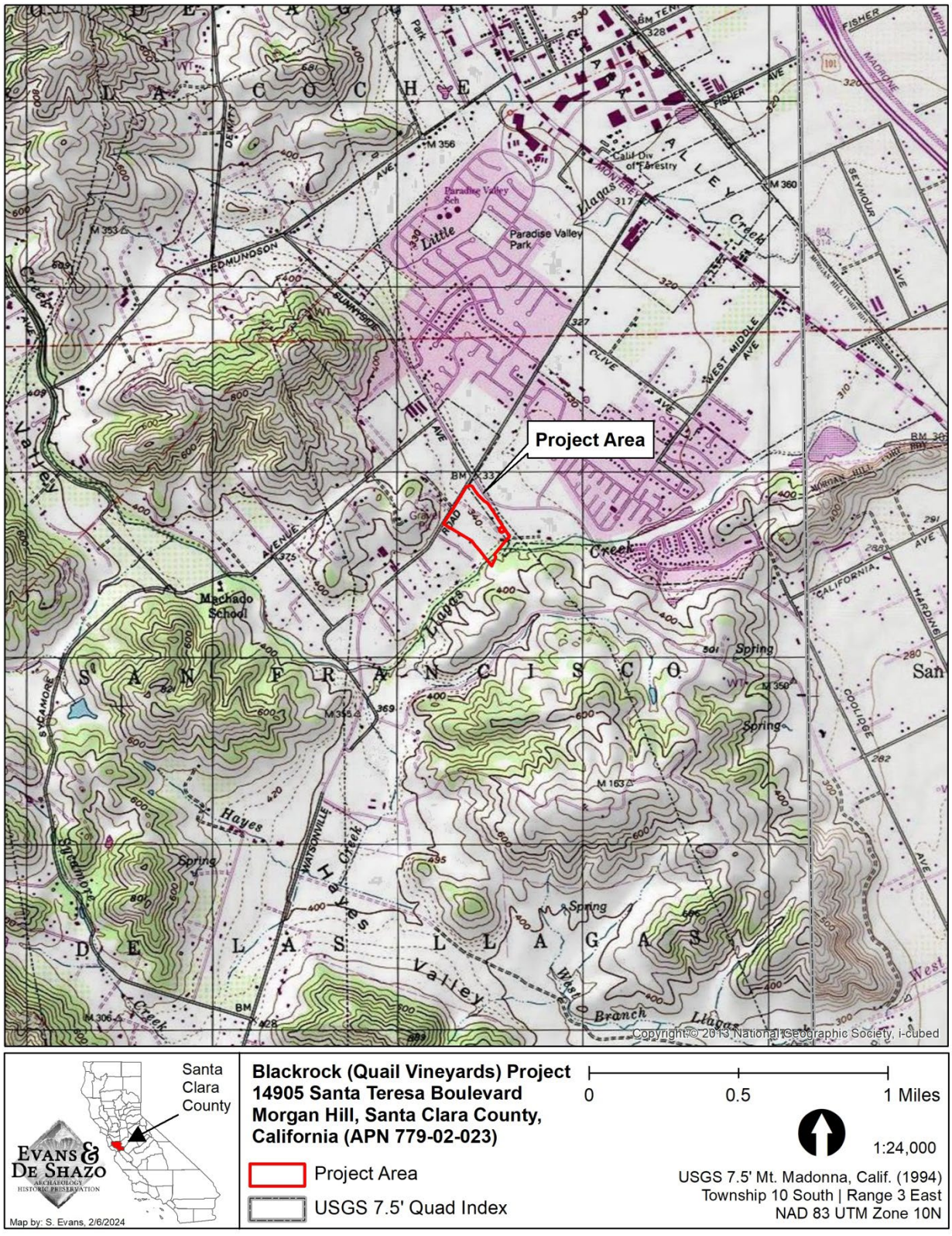

Figure 1. Project Area location map.

REGULATORY SETTING

The CEQA regulations and guidelines, as they pertain to cultural resources, are outlined below.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The CEQA regulations (PRC § 21000 et seq.) and the Guidelines for Implementing CEQA (14 CCR § 15000 et seq.) give direction and guidance for evaluating a project's potential impacts to the environment and the preparation of Initial Studies, Categorical Exemptions, Negative Declarations, Mitigated Negative Declarations, and Environmental Impact Reports. Pursuant to California State law, the City of Morgan Hill is legally responsible and accountable for determining the environmental impact of any land use proposal it approves. Cultural resources are aspects of the environment that require identification and assessment for potential significance under CEQA (14 CCR § 15064.5 and PRC § 21084.1). There are five classes of cultural resources defined by the State Office of Historic Preservation (OHP). These are:

- **Building**: A structure created principally to shelter or assist in carrying out any form of human activity. A "building" may also be used to refer to a historically and functionally related unit, such as a courthouse and jail or a house and barn.
- **Structure**: A construction made for a functional purpose rather than creating human shelter. Examples include mines, bridges, and tunnels.
- **Object**: Construction primarily artistic in nature or relatively small in scale and simply constructed. It may be movable by nature or design or made for a specific setting or environment. Objects should be in a setting appropriate to their significant historic use or character. Examples include fountains, monuments, maritime resources, sculptures and boundary markers.
- **Site**: The location of a significant event. A prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing building, structure, or object. A site need not be marked by physical remains if it is the location of a prehistoric or historic event and if no buildings, structures, or objects marked it at that time. Examples include trails, designed landscapes, battlefields, habitation sites, Native American ceremonial areas, petroglyphs, and pictographs.
- **Historic District**: Unified geographic entities which contain a concentration of historic buildings, structures, or sites united historically, culturally, or architecturally.

According to CCR § 15064.5, cultural resources are historically significant if they are:

- Listed in, or eligible for listing in, the CRHR (PRC § 5024.1, 14 CCR § 4850 et. seq.);
- Listed in, or eligible for listing in, the National Register of Historic Places (NRHP);
- Included in a local register of historical resources, as defined in an historical resource survey meeting the requirements of PRC § 5024.1(g); or
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency

determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in-light of the whole record.

METHODS

The methods used to complete the HRE included a review of documents obtained at the Northwest Information Center (NWIC) of the California Historical Information Systems (CHRIS) (NWIC File # 23-1051), including primary resource records associated with the Project Area and the cultural resource inventories listed below. EDS also conducted in-person research at the Santa Clara County Assessor and Recorder Office and online research (detailed below). In addition, EDS reviewed digital files maintained by EDS, including historical maps, aerial photographs, and other primary source documents. The purpose of the research was to understand the history of the Project Area and the history of the surrounding area to assist in developing a historical context to evaluate the historical significance of the historic built environment,[4] including the ca. 1883 barn, a 1966 house, a ca. 1955 detached garage, and associated landscape. EDS Principal Architectural Historian Stacey De Shazo, M.A. also completed a historic architectural survey of the built environment within the Project Area to identify the age, any known architectural style, design, form, character-defining features, materials, and alterations of built environment resources. Also, as part of the documentation, EDS completed updated DPR 523 forms for the 17.89-acre property, which are included in Appendix A.

CULTURAL RESOURCE INVENTORIES

As part of the record search, the following inventories were reviewed:

- National Register of Historic Places (NRHP)
- California Register of Historical Resources (CRHR)
- California Historical Landmarks (CHL)
- California Points of Historical Interest (CPHI)
- California Inventory of Historical Resources
- California Office of Historic Preservation (OHP) Built Environment Resources Directory (BERD) for Santa Clara County, California (2020)
- Santa Clara County Heritage Resource Inventory (updated May 16, 2023)
- City of Morgan Hill Historic Resource Inventory

[4] According to the National Park Service Bulletin 15, "historical contexts are those patterns, themes, or trends in history by which a specific occurrence, property, or site is understood, and its meaning (or significance) within history is made clear."

ONLINE RESEARCH

Online research was conducted using the following sources:

- www.ancestry.com
- www.newspapers.comn
- www.calisphere.org (University of California)
- https://oac.cdlib.org/ Online Archives of California
- http://www.library.ca.gov/ (California State Library)
- https://cdnc.ucr.edu/ California Digital Newspaper Collection
- https://mil.library.ucsb.edu/ap_indexes/FrameFinder/ (U.C. Santa Barbara Library)
- http://pcad.lib.washington.edu (Pacific Coast Architecture Database)
- https://aiahistoricaldirectory.atlassian.net (American Architects Directory)

Local Research

- Santa Clara County Recorder and Assessor's Office
    - On February 14th, 2024, EDS conducted research at the Santa Clara County Recorder and Assessor's office to obtain ownership history of the Project Area.
- Morgan Hill Historical Society
    - In February 2024, EDS emailed the Morgan Hill Historical Society via their website contact box regarding additional information about the Project Area. As of the date of this report, Morgan Hill Historical Society has not contacted EDS.

PREVIOUS DOCUMENTATION

The following section briefly describes the previous documentation of the 17.89-acre property (Project Area) and a relocation study.

SANTA CLARA COUNTY HERITAGE RESOURCE INVENTORY (1975, 1999, AND 2003)

In 1975, the 17.89-acre Project Area containing the "Barney Machado house" (no longer extant) was identified in the Santa Clara County Heritage Resource Inventory (1975), stating that the house was "built in 1863 with later additions...[and]. The redwoods were planted in 1874."[5] In 1999, the ca. 1883 barn was identified by the County of Santa Clara as the "1868 Barney Machado Barn" but was not documented or evaluated. In 2003, Dill Design Associates documented the ca. 1883 barn (identified as the "Barney

[5] Pauline Pace, "Santa Clara County Heritage Resource Inventory," Santa Clara County Historical Heritage Commissioner, https://archive.org/details/scc_heritage_resource_inventory_1975/page/n1/mode/2up, (accessed 3/7/2024).

Machado Barn") within the "Machado Barn Historic Resources Technical Review" (2003 Draft Report) and on DPR 523 forms.[6] The 2003 Draft Report recommended the barn was locally significant, and it was subsequently included on the Santa Clara County Heritage Resource Inventory. At this time, the Barney Machado house was no longer extant; however, according to the 2012 CIRCA report, the house was identified in the 2003 DPR 523 forms by Dill Design Associates as the property's "primary character-defining element," [7] while the barn was identified as a secondary feature. The 2012 CIRCA report states that Dill Design Associates advised in the 2003 DPR 523 forms, "Although the property no longer appears to have National Register eligibility, the barn is locally significant and retains architectural integrity that enables eligibility for the California Register under Criterion 2 and 3."[8]

Currently, the ca. 1883 "Barney Machado Barn" is listed within the County of Santa Clara Heritage Resource Inventory list (also known as the Heritage Resource Inventory list; updated May 16, 2023).

CIRCA: HISTORIC PROPERTY DEVELOPMENT (CIRCA 2012)

In 2012, CIRCA completed an HRE of the "1868 Barney Machado Barn" relying on information within the 2006 "Historic Context Statement for the City of Morgan Hill,"[9] and the 2003 Draft Report and DPR 523 forms completed by Dill Design Group in 2003. CIRCA agreed with the 2003 findings but added that the barn had further deteriorated and questioned the current physical integrity of the barn while maintaining that it is locally significant. Circa also stated that the "wing" additions on either side of the central part of the barn are later additions that may or may not fall within the period of significance for the barn provided by Dill Design Associates 2003 documentation. Furthermore, CIRCA identified the age of the 1966 house and ca. 1955 detached garage as being post-1970 construction, and as such, the two buildings were not evaluated or documented on DPR 523 forms. In addition, regarding the associated landscape, CIRCA stated the following.

> "…two Redwood trees were purportedly planted by Mary Machado in 1874 have lost their historic context due to the destructive deterioration and subsequent removal of the farmhouse. The tree's isolated condition without the once-adjacent homestead has no remaining historic association. The Redwood trees are not historically associated with the barn. Today the Redwood trees considerable distance from the barn act only as markers for the location of the now absent farm house."
>
> "Circa recognizes that the pair of Redwood trees is considered by the community to be a contributing element of the Machado property as remnants or the Machado farmhouse therefore special consideration should be used for planning purposes."

CIRCA also did not consider the remnants of the walnut orchard historic and did not include it in the 2012

[6] Although DPR 523 forms were completed in 2003, the City of Morgan Hill Planning Department does not have a copy of the 2003 DPRs, and they are not on file at the NWIC.

[7] CIRCA, "Machado Barn Historic Resources Technical Review (Draft Report), April 2012 (Revised August 2012).

[8] Ibid.

[9] Ibid.

analysis.

URBAN PROGRAMMERS (2022)

In 2022, Urban Programmers completed a "Study for the Relocation of the Barn at 14905 Santa Teresa Boulevard, Morgan Hill," to determine if "the barn… could be moved without destroying the character-defining features of a historic resource."[10] The 2022 study and supplemental email (dated November 2, 2022) from Bonnie Bamburg of Urban Programmers sent to Gina Paolini, Principal Planner at the City of Morgan Hill, state that the barn does not match the physical description provided in the 2003 DPR 523 forms and that the 1868 construction date was questionable based on their research, with the barn more likely dating to the 1890s (Appendix B). Urban Programmers concluded that "The number of alterations has greatly diminished the architectural integrity of the original small barn as well as its structural integrity...[and]...without significant historical importance associated with the barn, Urban Programmers believe the much-altered barn would not qualify as a historical resource."[11]

HISTORICAL SETTING

The Historical Setting includes a brief history of Morgan Hill and the specific history of the 17.89-acre Project Area. The Historical Setting is an element of the historical context from which the built environment resources within the Project Area were evaluated for historical significance.

MEXICAN PERIOD (1821 – 1846)

In 1821, Mexico declared its independence from Spain and took possession of "Alta California,"[12] marking the end of the Spanish period (1769 – 1821) and the beginning of the Mexican period, also referred to as the "rancho" period in Alta California. Although California was now under Mexican rule, in 1824, the present-day City of Sonoma was where the last and most northerly of the 21 missions, the Mission San Francisco Solano (i.e., Mission Sonoma), was constructed, the only mission established under an independent Mexican government within the Mexican era. In 1833, the Mexican government secularized the missions in California, and mission-owned land was dissolved. During this time, extraordinary changes occurred throughout Alta California, as the Mexican government lacked the strong oversight and military rule previously imposed by the Spanish. As such, there were new trade opportunities. Foreign ships that Spanish-guarded military ports had previously held off could now dock and provide a variety of provisions to local settlers throughout California. These new provisions included tea, coffee, sugar, spices, and spirits, as well as a variety of manufactured goods. Soon, these new provisions made their way into the region, and the taxes on these imported goods became the primary source of revenue for the Mexican government in Alta California. Likewise, products produced in Alta California were exported, which bolstered the hide and

[10] Urban Programmers, "Study for the Relocation of the Barn at 14905 Santa Teresa Boulevard, Morgan Hill," November 26, 2022.

[11] Ibid.

[12] Alta California was a polity of New Spain founded in 1769 and became a territory of Mexico after the Mexican War of Independence in 1821.

tallow trade that became the primary business activity in Alta California. During this time, the Mexican colonial authorities encouraged the settlement of Alta California by providing large land grants called ranchos to politically prominent persons loyal to the Mexican government and permitting foreigners to settle the land. As a result, the 20 or so ranchos in Alta California, issued during the Spanish period, increased to roughly 800 ranchos that varied from 10,000 to 20,000 acres during the Mexican era.

During this time, the Project area was located within Rancho San Francisco de las Llagas, a 22,283-acre Mexican land grant within present-day Santa Clara County granted in 1834 by Governor José Figueroa to Carlos Antonio Castro.[13]

EARLY AMERICAN PERIOD (1848 - 1851)

The beginning of the American Period in California is marked by the end of the Mexican American War (1846-1848) when the United States (U.S.) took possession of Mexican territories, including California, New Mexico, Texas, and Arizona in the signing of the Treaty of Guadalupe Hidalgo on February 2, 1848. The Treaty of Guadalupe Hidalgo provided resident Mexicans their American citizenship and guaranteed title to ranchos obtained during the Mexican period. However, less than two weeks before the signing of the treaty, on January 24, 1848, James Marshall discovered gold at Sutter's Mill, which marked the start of California's Gold Rush (1848 to 1855). Soon, the excitement of the Gold Rush and the promise of fertile and abundant land brought between 150,000 and 200,000 new settlers to California from all over the U.S. and Scotland, Ireland, England, Germany, and France.[14] [15] Many new settlers squatted on land during this time, including Mexican rancho and unclaimed land. To quickly resolve Mexican rancho land disputes, the U.S. Congress passed the California Land Act of 1851, establishing a three-member Public Land Commission (Commission) to determine the validity of prior Spanish and Mexican land grants.[16] The act required landowners who claimed title under the former Mexican government to file a claim with the Commission within two years. Although the Commission eventually confirmed most of the original Mexican land grants, the burden was on landowners to prove their title. The cost of litigation forced many rancho owners to sell off their land to newly arriving settlers, including some who had illegally squatted on their land, as well as land speculators and the lawyers hired to defend their land claims in court.[17]

In 1848, the heirs of Castro sold Rancho San Francisco de las Llagas, which included the present-day Project Area, to Martin Murphy Sr. sons, Daniel and Bernard Murphy.

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[13] Ogden Hoffman, *Reports of Land Cases Determined in the United States District Court for the Northern District of California*, Numa Hubert, San Francisco.

[14] Karen Clay, *Property Rights and Institutions: Congress and the California Land Act 1851*, The Journal of Economic History, Cambridge University Press, 59(01):122-142, March 1999.

[15] Commodore Stockton was also responsible for driving the Mexican forces out of California during the Mexican American War.

[16] The Spanish government-controlled California land from approximately 1770 to 1821 and the Mexican government-controlled California land from 1821 to 1846.

[17] Nancy Olmsted, *Vanished Waters: A History of San Francisco's Mission Bay*, Mission Creek Conservancy, San Francisco, 1986.

EARLY SETTLEMENT (1845 – 1892)

The following section was taken partly from the 2006 "Historic Context Statement for the City of Morgan Hill."[18]

The first European American settlers within present-day Morgan Hill were Irish-born Martin Murphy Sr. and German-born Mexican citizen Charles (aka Carlos) Maria Weber (who founded the city of Stockton). Martin Sr. was a successful farmer; however, in 1844, after the death of Martin Sr.'s wife, Mary Foley, and one of his grandchildren from malaria, he set out from Missouri to California with his five younger children, his older son, Martin Jr., his pregnant wife, their daughter, and her family. When they reached Iowa, their emigrant party, known as the Stephens-Townsend-Murphy Party, comprised 51 people, including 26 members of the Murphy family. The Stephens-Townsend-Murphy Party was the first wagon train to cross the Sierra Nevada Mountains during the expansion of the American West. Upon their arrival in the Sacramento Valley in 1845, Martin Sr.'s friend, Charles Maria Weber, traveled to the Santa Clara Valley on behalf of Martin Sr. and purchased an 8,927-acre rancho known as Rancho Ojo de Agua de la Coche from Juan Maria Hernandez. In 1846, Martin Sr. and his family arrived in Santa Clara Valley, and Weber conveyed the rancho to Martin Sr. At this time, Weber owned an 8,738-acre land grant that covered most of Coyote Valley. In 1846, the Murphy family and Weber were joined by Captain William Fisher, who purchased Rancho Laguna Seca. In 1852, William Tennant arrived, purchasing approximately 1,300 acres of land north of present-day San Martin. During this time, these four Euro-American settlers, Murphy, Fisher, Weber, and Tennant, owned nearly all the land from San Jose in the north to Gilroy in the south.[19]

In 1850, Martin Sr. and his family moved from the Hernandez Adobe, which had become known amongst travelers as an open and friendly resting point, to a new wood-framed house (no longer extant) that Martin Sr. had built near present-day New Avenue in San Martin, south of Morgan Hill. This same year, Helen Murphy, the youngest daughter of Martin Sr., who had lived with her father at the Hernandez Adobe, married Charles Weber, and they moved to Stockton. Then, in 1851, Daniel, the youngest son of Martin Sr.- married Maria Fisher, the daughter of Captain Fisher, heir of Rancho Laguna Seca. In 1852, Tennant purchased a house known as the 21-Mile House (no longer extant; State Historic Landmark No. 259) in present-day Morgan Hill (Figure 2) from William Host. Tennant then converted the house to a tavern, and in 1860, it became the stagecoach stop for the Butterfield Overland Stage. The tavern's name, 21-Mile House, was due to its location 21 miles south of San Jose via Monterey Road. During this time, no permanent town settlement existed in the area, which resulted in Santa Clara County naming the area Burnett Township. In 1853, tragedy struck the Murphy family when 35-year-old Bernard Murphy (son of Martin Sr.) and his nephew, 23-year-old Thomas Kell Jr. (the son of Martin Sr.'s daughter Margaret), set out on a business trip to San Francisco, boarding the side-wheel steamboat the *Jenny Lind* at the town of Alviso, north of San Jose. A short time after the steamboat left Aviso, the boiler exploded, killing Bernard and Thomas Jr. Both men were buried in a catholic church in San Jose, which Martin Sr. would frequently travel to by horse to attend mass and visit their graves. However, the trip was long, and Martin Sr. soon decided to build a small chapel

[18] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.
[19] Ibid.

and cemetery within his ranch. He then gave the Catholic church four acres of land on his property and donated the money to build the chapel he named San Martín Chapel. The chapel was built near his house at the present-day intersection of New and San Martin avenues in San Martin.

Figure 2. ca. 1890 photograph of 21-Mile House (California Registered Historical Landmark No.259) along Monterey Road in present-day Morgan Hill (courtesy of the San Jose Public Library California Room).

During the 1860s, the area of present-day Morgan Hill remained a ranching and farming community – with very few landowners – growing crops such as wheat, hay, fruit orchards, and vineyards.

According to the "Historic Context Statement for the City of Morgan Hill,"

> "*The land was so fertile in many areas that very little work was required beyond planting and harvesting. Any vegetables were raised in small plots near the home. Some small plots were leased to Chinese immigrants on a sharecropping basis so they could grow vegetables to sell door to door to augment their wages. Vegetables were not only more labor intensive than grains, but they were more resource intensive as well. With water*

always at a premium, only small plots could be adequately irrigated and cared for."[20]

Throughout the 1860s, growth remained slow in the area of present-day Morgan Hill, as the land remained in the hands of a few large landowners. At this time, the Project Area was likely utilized for cattle grazing or growing crops. No towns developed in the area, except for the small community around the 21-Mile House.

> "*Traditionally, early towns developed in geographically strategic locations: trading crossroads, rail line hubs, near water or close to supplies of natural resources. Morgan Hill has none of these things. The physical existence of a town of Morgan Hill did not appear until roughly 1892, the year the ranches were subdivided. Prior to that, the region consisted of several remote homesteads surrounded by thousands of acres of ranchland. The closest settlements were the stage stops at Madrone (known as Burnett Township on early maps) and Tennant. Both grew up around roadhouses and train stops that served travelers going between San Jose and Monterey*."[21]

In 1869, the Santa Clara and Pajaro Valley Railroad (SC&PVRR) was completed to support the growing agricultural industry within the Santa Clara Valley. The railroad ran directly behind Burnett Township near the 21-Mile House and parallel to Monterey Road. The rail stop was called Mil's Switch, but locals called the station "San Martin" after the nearby Martin Sr.'s chapel. The SC&PVRR was a short-lived independent rail, and in 1870, it was purchased by the Southern Pacific Railroad (SP).

Martin Sr.'s remaining children had acquired over 70,000 acres of land during this time, including in the Santa Clara Valley and the present-day cities of Milpitas, Sunnyvale, Stockton, and Sacramento.[22] After Liberata's second husband, Dr. George H. Bull, died in 1875, her daughter Maria and son-in-law Daniel inherited the 19,973-acre Rancho Laguna Seca, adjacent and north of Martin Sr.'s Ojo de Agua de la Coche rancho property, which they also inherited. In addition to the vast amount of rancho land they owned in the Santa Clara Valley, Daniel also acquired vast amounts of acreage in Nevada and Mexico, and at one time, he was known as the "largest landowner in the world."[23] Daniel and Maria had three children: Mary, Daniel Jr., and Diana. In 1876, Mary died in childbirth at the age of 20. In 1882, against her father's wishes, Diana secretly married Hiram Morgan Hill, a 34-year-old bank associate and clothing model she met in San Francisco. Shortly after the secret marriage, Daniel died at his ranch in Nevada. After Daniels' death, Daniel Jr. inherited the property in Mexico and Diana inherited her father's land in the Santa Clara Valley and Nevada.

According to "Historic Context Statement for the City of Morgan Hill,"

> "*Hiram Morgan Hill was born to Quaker parents in Cape Girardeau, Missouri, in 1848. He and his younger sister, Sarah Althea Hill, were orphaned at a young age and taken in by their maternal grandparents. Family legend says that Morgan fell in love with his cousin at*

[20] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.
[21] Ibid.
[22] City of Morgan Hill, "History – Early Years", https://www.morgan-hill.ca.gov/315/History, (accessed 2/29/2024).
[23] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.

age 19 and was forced by his grandmother to leave Missouri to avoid any trouble. In 1870, Sarah and Morgan were each given their inheritances and then sent off to San Francisco. Morgan Hill became a bank associate and clothing model. He became known for his taste in clothes and carriages and generally enjoyed San Francisco society.

Because he was a Quaker and socially unacceptable to Diana's wealthy and very Catholic family, the two were secretly married in 1882 just before Daniel Murphy's death. On his deathbed in Nevada, he asked Diana to promise him that she would not marry Hill. The guilt of her secret marriage and the later promise to her now deceased father, prompted Diana to seek a divorce. However, she never followed through and the couple left for an overdue honeymoon in Europe. Two years later, their only child, Diane Murphy Hill, was born and Morgan left for Nevada to manage his father-in-law's lands there. In 1886 the young family returned to southern Santa Clara Valley where Diana and Morgan were now heirs to 22,000 acres of the original Ojo de Agua de la Coche rancho. They built a wood frame house on the flat lands of the valley just beneath El Toro and called it Villa Miramonte."[24]

During this time, agriculture production in Santa Clara Valley was booming, and there was a high demand for labor to work the expansive farms. Though the agricultural labor was first satisfied by Chinese immigrants, by the 1870s, Santa Clara County was experiencing a wave of anti-Chinese activities that swept through California. In 1875, California's senators pressured their fellow lawmakers in Washington D.C. to pass the Page Act, which was an act that "prohibited convicted felons, prostitutes, and Asian contract laborers" from entering the U.S. This resulted in a series of anti-immigrant laws and practices, of which the most sweeping anti-Chinese law was the "Chinese Exclusion Act" of 1882 that banned all Chinese laborers from entering the U.S., except for students, merchants, teachers, travelers, and diplomates. By the 1880s, many Chinese workers had been replaced by Japanese immigrants, and later Filipino and Mexican immigrants. In 1881, the area of present-day Morgan Hill, including the land between Burnett Township (aka Madrone) to the north and Gilroy to the south, had a population of only around 540 people.[25]

MORGAN HILL (1892 – 1980S)

By the 1890s, Burnett Township and Tennant (the area near the 21-Mile House) were the primary commercial centers – though they were small and surrounded by farmland. Although several rail stops were established in the area during the 1880s, including at Coyote, Madrone, Tennant, and San Martin, they were mainly established to support the transportation of the agricultural products produced by the large landholders or passengers traveling from San Jose to Gilroy or onto Monterey. The area also had only a few small schools to serve the families working on the farms. There was also a hot springs resort, known as Madrone Soda Springs, located seven miles northeast of present-day Morgan Hill, a popular resort in the late 1800s and early 1900s that included a small hotel, a pavilion, a barn, and ten cabins. However, no town existed, and the passenger rail line service was limited. This all changed in 1892, when the rancho land was

[24] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.
[25] Ibid.

subdivided by developers associated with the railroad, most notably Chauncey Hatch (C.H.) Phillips, who worked for the SP railroad and was involved in promoting and developing the future town of Morgan Hill.

Prior to the subdivision of rancho land, "the region consisted of several remote homesteads surrounded by thousands of acres of ranchland. The closest settlements were the stage stops at Madrone (known as Burnett Township on early maps) and Tennant. Both grew up around roadhouses and train stops that served travelers going between San Jose and Monterey."[26] However, this changed when C.H. Phillips arrived in the early 1890s. C.H. Phillips worked with Hiram Morgan Hill and the Murphy heirs to "survey and subdivide most of Santa Clara Valley south of San Jose."[27] More than 40,000 acres were included in these efforts, resulting in the new town called Huntington, later renamed Morgan Hill. The Hill and Murphy land subdivision was one of Phillips' most significant projects,[28] however, he was up for the task. During this time, Phillips worked for the SP railroad, acquiring vast amounts of former rancho land for subdivision and future purchase and development by new residents and investors.

In 1892, Hiram Morgan Hill and Diana Murphy Hill worked with Phillips, selling all but 200 acres surrounding their home, Villa Miramonte (extant). Upon securing approximately 20,000 plus acres of the former rancho land from the Hills for development, Phillips laid out the town center and several major roads. The development project was so large that Phillips set up a San Jose office and brought in other partnering firms to handle dealing with the over 20,000 acres of land that the SP railroad had acquired. At the same time, the remaining heirs of Murphy, Murphy-Dunne, and Fisher also began selling their land to the railroad for subdivision.[29] In 1893, the SP railroad constructed the Morgan Hill rail depot (no longer extant), and fruit dehydrators and packing plants were soon built, supporting the change from ranching to orchard farming near the Morgan Hill train station. The Morgan Hill train station and the new packing plants "contributed to a decrease in cattle ranching activity,"[30] which had continued to dominate the area through the early 1890s, and an increase in economic dependence on orcharding and fruit processing.

In 1895, to attract potential investors to the new town, Phillips printed brochures that stated, "Most of the land… is now held in small tracts, and the opportunity presented to purchase unimproved land for orchard purposes brought in the vicinity many families."[31] Phillips then began selling lots for $100 to $125 per acre.[32] The lots near Monterey Road and the SP rail line sold reasonably quickly, and by 1896, there were approximately 250 residents in the developing town of Morgan Hill.[33] By this time, there was a "train depot,

[26] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.
[27] Ibid.
[28] Phillips previously worked with the SP railroad company on the expansion of other towns in California, including San Luis Obispo and Paso Robles, and on the creation of new towns, including Templeton, Pismo Beach, and Morro Beach.
[29] Bernard Murphy's wife, Catherine Murphy Dunne.
[30] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.
[31] Circa, "Historic Context Statement for the City of Morgan Hill", City of Morgan Hill, 2006.
[32] "Santa Clara County and Its Resources; Historical, Descriptive, Statistical: a souvenir of the San Jose Mercury News", San Jose Mercury Publishing and Printing Co, Smith & Batton, San Jose, 1896.
[33] Ibid.

post office, telephone station, express office, two hotels, a restaurant, three stores, a livery stable, lumber yard, and several small shops with several comfortable residences"[34] (Figure 3, Figure 4, and Figure 5). However, by the early 1900s, many of the larger 10 to 50-acre lots east of Monterey Road were still unimproved. As such, the SP railroad and local promoters for the land, including Morgan Hill resident C.H. Barrett, resorted to increasingly issuing extravagant pamphlets and brochures to attract buyers over almost twenty years (Figure 6). In 1906, Morgan Hill was incorporated with a population of 500 residents. Throughout the early 1900s, several subdivisions of the larger lots continued, and in 1912, the remaining 200 acres held by Hiram Morgan Hill and Diana Murphy Hill were finally subdivided into 10-acre lots; however, their heirs continued to own Villa Miramonte and a surrounding 10-acre portion of land until 1939.

Figure 3. ca. 1896 photo collage showing Morgan Hill's Main Street (top left), the 1894 grammar school (top right), the SP railroad depot (middle), the Baptist Church (bottom right), and the Methodist Church (bottom left) (courtesy of the San Jose Public Library).

[34] "Santa Clara County and Its Resources; Historical, Descriptive, Statistical: a souvenir of the San Jose Mercury News", San Jose Mercury Publishing and Printing Co, Smith & Batton, San Jose. 1896.

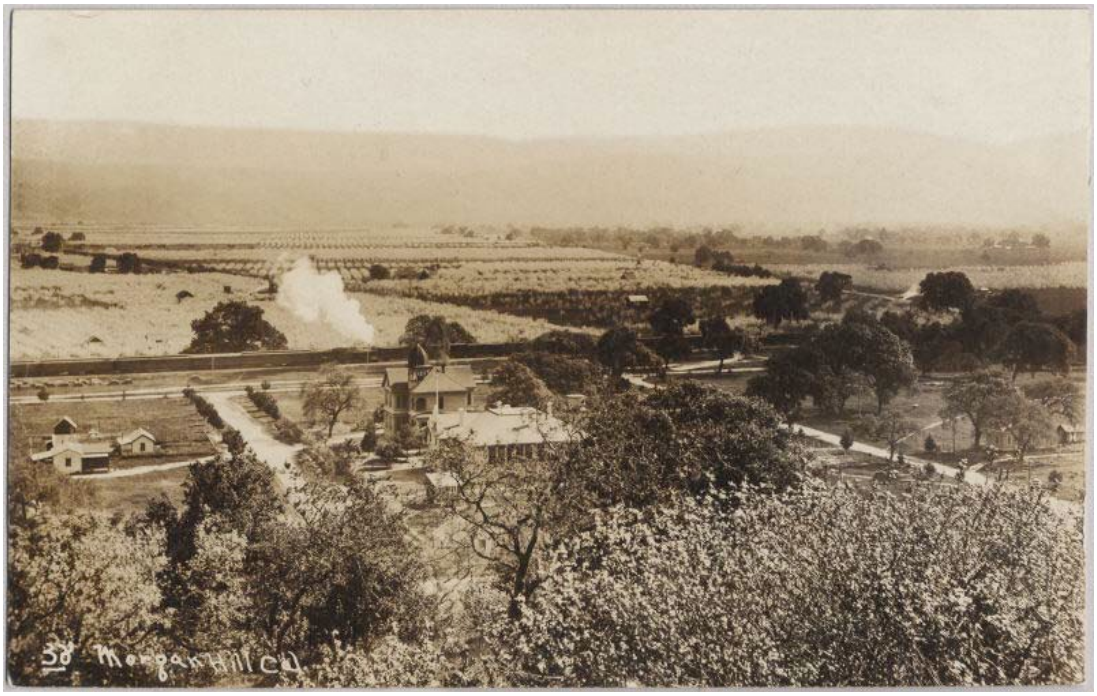

Figure 4. ca. 1900 photograph of Morgan Hill, showing the first grammar school constructed in Morgan Hill in 1894 (two-story building; no longer extant) and the adjacent single-story 1907 school (extant; now the Morgan Hill Grange), situated west of the railroad line and east of Monterey Road in downtown Morgan Hill (courtesy of the San Jose Public Library).

Figure 5. ca. 1900 photograph of the "street scene" along Monterey Street in Morgan Hill (courtesy of the City of Morgan Hill).

Figure 6. A 1901 advertisement from the SP railroad company selling lots in Morgan Hill (courtesy of the City of Morgan Hill).

During the 20th century, several small communities near Morgan Hill – such as Madrone – were in decline. The decline is attributed to the construction of the Morgan Hill train depot, which then became the primary railroad station in the area.[35] However, despite Morgan Hill's prime location mid-way between San Jose and Gilroy, along Monterey Road and the SP rail line, Morgan Hill remained underdeveloped, with many of its subdivided lots in and around the town unsold. The ability of the SP Railroad Company to quickly sell the newly subdivided lots was likely due to the requirement that the land was "either purchased outright, in cash, or it was paid for over five to seven years."[36] During this time, even modest sums (typically several hundred dollars) required to purchase the 10-acre lots were beyond the means of most people.[37]

In the early 20th century, the growth of the new town of Morgan Hill had stalled; however, in the 1910s and 1920s, the affordability of the automobile spurred the construction of new roads and bridges across the U.S., including in Morgan Hill. During this time, transportation developments in the town had the designation in 1909 of Monterey Road as part of the state highway system (pre-1964, referred to as Legislative Route Number [LRN] 2 and later U.S. 101). Then in the 1920s, Monterey Road became part of the new US 101 system, increasing automobile travel and bringing tourism and new businesses to Morgan Hill, including the Friendly Inn (1919), the Skeels Hotel (Figure 7), the Empire Theater (1912), the Granada

[35] Circa, "Historic Context Statement for the City of Morgan Hill," City of Morgan Hill, 2006.

[36] Eugene Taylor Sawyer, History of Santa Clara County, California, With Biographical, Sketches of the Leading Men and Women of the County, Los Angeles, California, Historic Record, Co., 1922.

[37] Circa, "Historic Context Statement for the City of Morgan Hill," City of Morgan Hill, 2006.

theatre (1923), gas stations, motor court motels, restaurants, and shops, which filled downtown Morgan Hill on either side of Monterey Road between Dunne and Main avenues. This growth increased the population of Morgan Hill from 500 in 1906 to 1,500 in 1922. During this time, the agricultural economy of Santa Clara Valley was booming, and stone fruits, including apricots, peaches, cherries, and prunes, for which Morgan Hill was known, were the main crops (Figure 8). In the late 19th century, fruit grower and founder of California's prune industry Louis Pellier introduced the French Petit d'Agen variety of prunes to the Santa Clara Valley, which became a staple crop in the area. Then, in the early 20th century, Morgan Hill resident and nurseryman Leonard Coates, who owned Leonard Coates Nursery Co. (Figure 9), developed a variety of the original strain of the French Petit d'Agen that he called "1418", which was especially suited to the soils around Morgan Hill. The "1418" prune was "so naturally sweet that they were used as a sugar substitute" during World War I (1916-1918) and were subject to rationing during World War II (1939-1945).[38] The "1418" prune also became the standard bearing prune stock for Santa Clara Valley.

During the 1920s, anti-Japanese sentiment was on the rise, and in 1920, the Alien Land Law was passed. This legislation took away land ownership rights from any foreign-born Japanese settlers by denying them the ability to apply for U.S. citizenship, limiting land ownership to only the native-born population; however, this law was rarely enforced in Santa Clara Valley.[39] The new law was used to threaten Japanese Americans who might try to fight the discriminatory law. Some Japanese Americans avoided the new law by transferring or purchasing land in their children's names or through dummy corporations or business partnerships. During the Great Depression (1929-1933), social tensions were again high as many citizens blamed Japanese Americans and other minorities for their economic situation.

The 1940s brought significant change to the U.S. and residents of Santa Clara Valley when, on December 7, 1941, Japan bombed Pearl Harbor, Hawaii, and the U.S. declared war on Japan, marking the U.S.' entrance into WW II. Suspecting potential spies within the Japanese American population, the U.S. government quickly enacted a series of measures to restrict the travel of Japanese Americans to the U.S. and Hawaii. On February 19, 1942, President Roosevelt signed Executive Order 1066, which authorized the internment of 120,000 people of Japanese descent, including Nisei, who were Japanese Americans born to Japanese parents, and Issei, who were the first generation of Japanese to immigrate to the U.S., in 11 camps located across seven states. In March 1942, the Japanese American communities throughout Santa Clara Valley were told they would have to relocate to military areas for assignment to internment camps. After WW II ended in 1945, the Japanese residents returned after being interned in camps throughout the U.S. from 1942 to 1945. The War Relocation Authority (WRA) gave each person $25 in cash and a train or bus ticket back to their hometowns. Some residents returning to San Jose found their belongings stored by churches or trusted neighbors. In contrast, others discovered their homes and businesses in disarray, and their things were often stolen or broken.[40] Many returning residents who could not stay with relatives and friends or find decent available housing ended up in hostels, sleeping at local churches, or on farms. Though the

[38] Circa, "Historic Context Statement for the City of Morgan Hill," City of Morgan Hill, 2006.

[39] Ibid.

[40] James C Williams, and Kent Seavey, "Gilroy Yamato Hot Springs National Register of Historic Places Nomination," (NR#95000996), Washington, DC: National Park Service, 1995.

Japanese American population on the West Coast had nearly returned to pre-WW II population levels by 1950, it was a different community than before the war.

After WW II, many of the orchards in the Santa Clara Valley were replaced with housing and industrial parks, and although "statewide acreage devoted to stone fruits declined by nearly 20 percent, the output per acre continued to rise."[41] During this time, Morgan Hill did not experience a housing boom like the neighboring towns such as San Jose, resulting in Morgan Hill remaining a small farming community consisting of small fruit orchards, cattle ranches, dairy ranches, and poultry farms – some with small family-owned and operated commercial hatcheries. However, as land values increased during the 1940s and 1950s, some small commercial hatcheries sold their land for housing and other non-agricultural uses.[42] Around this time, Morgan Hill saw one of its most significant transitions when, in 1943, IBM relocated its "Card Plant" facility from East Santa Clara Avenue in San Jose to Morgan Hill. According to "Historic Context Statement for the City of Morgan Hill,"[43]

> "*What began as a small manufacturing outpost turned into the west coast headquarters for a technology giant. Over the next decade and a half, IBM continued to expand their presence in the areas south of San Jose. For Morgan Hill, this expansion hit home in 1957 when IBM opened their famous Cottle Road campus about ten miles north of Morgan Hill, in southern San Jose. They became the first, and the largest, industrial employer for Morgan Hill residents. Before this, the population was primarily employed on farms or in blue-collar professions. The average citizen was a jack-of-all-trades who performed many different jobs in his efforts to make ends meet. After IBM opened the Cottle Road campus, a shift began towards more white-collar workers who built larger houses, in planned developments. The most immediate result was the creation of the Jackson Oaks and Holiday Lake Estates east of Morgan Hill on land that was annexed in the 1960s*."[44]

After the arrival of IBM, a shift from an agricultural economy to a technology-based economy began to occur in Morgan Hill. In 1958, Morgan Hill annexed the community of Madrone. During the 1960s, although agriculture remained an essential element in Morgan Hill, Silicon Valley began earning its name with the influx of high-tech industries. The shift to high-tech industry changed the employment options for residents and created new investment opportunities for landowners and developers; and the land within and around Morgan Hill became more valuable for its location than its agricultural yield. In 1970, a freeway overpass was completed that diverted traffic away from downtown Morgan Hill, resulting in the closure of many businesses.

[41] James C Williams, and Kent Seavey, "Gilroy Yamato Hot Springs National Register of Historic Places Nomination," (NR#95000996), Washington, DC: National Park Service, 1995.

[42] Ibid.

[43] Circa, "Historic Context Statement for the City of Morgan Hill," City of Morgan Hill, 2006.

[44] Ibid.

Figure 7. ca. 1920 photograph of the "Hotel Sheels" in Morgan Hill (courtesy of the San Jose Public Library).

Figure 8. 1933 photograph of a fruit orchard in Morgan Hill (courtesy of the San Jose Public Library).

Figure 9. Cover from 1915 and 1916 Leonard Coates Nursery Company catalog (courtesy of the Biodiversity Heritage Library).

PROJECT AREA HISTORY

Prior to the construction of the ca. 1883 barn,[45] 1966 house, ca. 1955 detached garage, and associated landscape within the Project Area, it was part of the 22,283-acre Rancho San Francisco de las Llagas, which was granted to the brothers Martin Murphy Jr. and James Murphy on March 19, 1868.[46] The brothers were part of the Pioneer Murphy family, which was the first wagon party to arrive in California via the Sierra Nevada route. The patriarch of the family, Martin Sr., was born in 1785 in County Wexford, Ireland.[47] Martin Sr. fought in the Irish Rebellion of 1798 alongside his father; although he survived the five-month-long rebellion and was allowed to retain his property, it had to be deeded to his oldest son, or other children.[48] In 1805, Martin Sr. married Mary Foley, born 1787; together, Martin Jr. and Mary had nine children: Martin Jr., James, Margaret, Johanna, Mary, Bernard, Helen, John and Daniel. James was born in 1809 in County

[45] Based on the findings in this HRE, the date and original ownership of the barn within the Project Area have been updated.

[46] James J. Ayers, *Report of the Surveyor-General of the State of California from August 1, 1884, to August 1, 1886,* (Sacramento, CA: 1886) 22.

[47] William Briggs, "Martin Murphy: An Immigrants Courage," *Today,* Spring 2020, 108.

[48] Ibid.

Wexford.[49] In 1819, Martin Sr. moved his family, which consisted of his wife and six oldest children, to Quebec City, where the family stayed until 1840.[50] The Murphy family moved to Missouri, but following the death of Mary in 1843, Martin Murphy Sr. was advised to move to California, which promised a temperate climate and religious freedom.[51] In 1844, the entire Murphy family, along with three other Irish families, formed the Stephens-Townsend-Murphy Party, which consisted of fifty members and was the first pioneer group to pass through the Sierra Nevada mountains; while their journey began in 1844, they did not arrive in San Jose until 1845.[52] Upon their arrival, they became Mexican citizens and began buying vast amounts of Mexican land, including the 22,293-acre grant known as San Francisco de las Llagas where the Project Area is located.

On March 19, 1868, the 22,283-acre Rancho San Francisco de las Llagas was patented to brothers Martin Jr., James, Daniel, and Bernard Murphy. At this time, the Project Area was located within James' portion of this rancho; the extent of his portion is unknown, as the rancho and surrounding ranchos were divided between the Murphy brothers and sisters and their extended family. James Murphy (Figure 10) was born on September 19, 1809, in the County of Wexford, Ireland, the second son of the Irish Pioneer Martin Murphy Sr. On April 12, 1839, James Murphy married Ann Jane Martin in Frampton, Quebec, Canada. Ann Jane Martin was born October 10, 1821, in County Offaly, Ireland. Her family emigrated to Canada, where they met the Murphy family, who had similarly moved to Canada from Ireland. The couple had four children: Daniel, Mary, William, and Elizabeth. Initially, they lived in San Rafael, where James worked selling lumber used to build the wharves in San Francisco. Around the time of the gold rush, they moved to the family ranch, where James worked as a farmer. Around 1870, the couple's oldest daughter, Mary, who no longer lived with the family, married Bernard "Barney" Machado in 1867. In 1872, James Murphy established Ringwood Farm in the Orchard District of San Jose near Milpitas (Figure 11). The family remained at Ringwood Farm (Figure 12) until Ann died. James Murphy died on January 14, 1888, in San Jose, and Ann Jane (née Martin) Murphy died on September 15, 1900, in Milpitas.

[49] Findagrave.com, "Mary Foley Murphy: 1787-1843," https://www.findagrave.com/memorial/158513649/mary_murphy (accessed March 21, 2024).

[50] Ancestry.com. 1825 Census of Lower Canada.

[51] William Briggs, "Martin Murphy: An Immigrants Courage," *Today,* Spring 2020, 108.

[52] Michael C. O'Laughlin, *Irish Families on the California Trail: Pioneers and 49ers from the Earliest Days Including the Gold Rush & San Francisco*, Irish Roots Café, 2003. F-29.

Table 1. Ownership and Occupancy History.

ca. 1883 barn, 1966 single-family house, ca. 1955 detached garage, and associated landscape		
Year(s)	**Owners/Occupants**	**Details**
1883-1908	Owners: Bernard " Barney" Machado and Mary Frances (née Murphy) Machado	• On October 13, 1883, Bernard Machado purchased 1,783.86 acres of the Rancho San Francisco de las Llagas, including the 17.89-acre Project Area, from his father-in-law, James Murphy (Figure 13).[53] In ca. 1883, the barn was constructed, and although EDS cannot confirm the date, it appears that around this time, what was previously referred to as the Barney Machado house (no longer extant) was constructed. • Bernardo Serafino Machado, later known as Bernard Machado, was born in 1842 in California to Juan Machado and Maria Machado.[54] Mary Frances Murphy was born in 1842 in Canada to James and Ann Jane (née Martin) Murphy.[55] • In 1867, Bernard and Mary married in Los Angeles; together, they had seven children: James, John, Ellen, B.J. Stella, Grace, and Mary.[56] Although the family lived and worked in Santa Clara County, the location of their residence remains unknown – noting that according to the 1880 U.S. Federal Census, the family lived in the Gilroy Township, though outside of town. During this time, Bernard worked as a farmer and Mary "kept house".[57] According to the 1884 voter registration, Bernard worked as a farmer and resided in Solis, a former rancho adjacent to Rancho San Francisco de las Llagas.[58] By 1900, the Machado family lived in the Burnett Township,[59] part of present-day Morgan Hill and within the former Rancho San Francisco de las Llagas.[60] • While some previous documentation described Bernard as a

[53] Newspapers.com, "Notice of Trustee's Sale," *Los Angeles Herald,* December 1, 1896.
[54] Findagrave.com, "Bernardo Seferino "Barney" Machado," https://www.findagrave.com/memorial/98522873/bernardo_seferino_machado (accessed March 22, 2024).
[55] Findagrave.com, "Mary Frances *Murphy* Machado," https://www.findagrave.com/memorial/98522893/mary_frances_machado (accessed March 22, 2024).
[56] Ibid.
[57] Ancestry.com, "1880 United States Federal Census for B. S. Machado California Santa Clara Gilroy 258."
[58] Ancestry.com, "California, U.S., Voter Registers, 1866-1898 for Barney Seferino Machado, Santa Clara 1880-1890."
[59] During this time, the stagecoach stop at Madrone was also known as Burnett Township.
[60] Ancestry.com, "1900 United States Federal Census for Barney S Machado California Santa Clara Burnett District 0047."

ca. 1883 barn, 1966 single-family house, ca. 1955 detached garage, and associated landscape		
Year(s)	**Owners/Occupants**	**Details**
		farmer, an 1895 newspaper article (Figure 14) described his operations as a fruit orchardist, including peaches,[61] which likely included the Project Area. This same year, Bernard and Mary donated land within the Rancho San Francisco de las Llagas and money to construct the Machado School (extant; Figure 15).[62] • Bernard Machado died in 1908. [63]
1908 - 1914	Owner: Mary Frances (née Murphy) Machado	• Following Bernard's death, the property was passed to his wife, Mary, though much of the 1,783.86-acre property had been subdivided and sold by this time. By 1914, the land, including the Project Area, was sold to J.W. Stone and Charles Willis Stone, while Mary maintained ownership of 311.62 acres of the original property. • Mary died in 1916 in San Jose. [64]
1914-1917	Owners: J.W. Stone and Charles Willis Stone	• By 1914, the Property was part of a 35.67-acre property owned by "J.W.S," J.W. Stone, and "C.W.S," Charles Willis Stone, as demonstrated by the 1914 Santa Clara County Official Map. • EDS was unable to find additional information about J.W. Stone.
1917-1928	Owners: Charles Willis and Catherine (née Walrath) Stone, and Floyd Clyde and Geneva Eleanor Stone	• In 1917, the Project Area was owned by Charles Willis Stone, Catherine Stone nee Walrath, Floyd Clyde Stone, and Geneva Eleanor Stone.[65] It does not appear that any of the owners lived within the 35.67-acre property during their ownership. • Charles was born in Minnesota in 1858, and Catherine was born in Wisconsin in 1865. In 1883, Catherine and Charles married in Wisconsin and had three children together: Fred, Floyd, and Nellie. • According to the 1920 Federal Census, Charles owned a poultry farm in the San Quito Prescient of the Gilroy Township, and Catherine "kept house".[66] Charles died in 1940, and Catherine died in 1958.[67]

[61] Newspapers.com, *The Selma Irrigator*, March 16, 1895.

[62] U.R. Sharma, *Images of America Morgan Hill,* Morgan Hill Historical Society, (Charleston: SC, Arcadia Publishing, 2005).

[63] Ancestry.com. "Barney S Machado in the California, U.S., Death Index, 1905-1939, December 23, 1908."

[64] Ancestry.com. California, U.S., Death Index, 1905-1939.

[65] Santa Clara County Deed, 1917.

[66] Ancestry.com. 1920 United States Federal Census.

[67] Ancestry.com. California, U.S., Death Index, 1940-1997.

ca. 1883 barn, 1966 single-family house, ca. 1955 detached garage, and associated landscape		
Year(s)	**Owners/Occupants**	**Details**
		• Floyd was born in 1889 in South Dakota, and Geneva was born in 1864 in Wisconsin. In 1916, Floyd and Geneva married in San Jose. They had three children, including Mary, Betty, and Charles. Floyd and Geneva lived on Ringwood Avenue in San Jose during their ownership. Floyd worked as a foreman for a farm in the area, and Geneva "kept house".[68] Floyd and Geneva lived in the San Jose area until Floyd's retirement in 1950, after which, they moved to Marysville and then Redding in 1952.[69] • Floyd died in 1984, and Geneva died in 1971.[70]
1928-1964	Owners: Rasmus Christensen and Maria M. Christensen	• In 1928, Rasmus Christensen and Maria M. Christensen owned the 35.67-acre property, including the Project Area. However, according to the 1929 Official Map of Santa Clara County, the 35.67-acre parcel was divided into two parcels, one of which is the 17.89-acre Project Area. • Rasmus was born in 1874 in Denmark, and Maria was born in 1873. They married in Denmark (date unknown) and immigrated to the U.S. in 1894. Rasmus and Maria had four children: Harry, Clara, Elvera, and Alfred. • The 1930 U.S. Federal Census shows Rasmus and Maria residing on Watsonville Road within the Project Area, where Rasmus owned and operated a farm and Maria "kept house".[71] Between 1931 and 1940, Maria died (exact date is unknown). After her death, Rasmus continued living within the Project Area with his son, Harry. Rasmus and Harry operated a farm within the Project Area, raising livestock. • During Rasmus's ownership of the property, he constructed the detached garage in ca. 1955; however, by this time, Rasmus was living on Tenant Avenue with his son Harry and was retired.[72] It was during this time that the Walnut Orchard may have been planted. • Rasmus died in 1952.[73] After his death, the Project Area was

[68] Ancestry.com. 1920 United States Federal Census.

[69] Newspapers.com, "Geneva Eleanor Stone," *Record Searchlight*, Mary 12, 1971.

[70] Ancestry.com. California, U.S., Death Index, 1940-1997 .

[71] Ancestry.com. 1930 United States Federal Census.

[72] Ancestry.com. *1950 United States Federal Census* .

[73] Ancestry.com. *California, U.S., Death Index, 1940-1997.*

ca. 1883 barn, 1966 single-family house, ca. 1955 detached garage, and associated landscape		
Year(s)	**Owners/Occupants**	**Details**
		briefly passed on to his son Harry.
1964-1988	Owner: Ruth E. Jones (née Hubbard) and John W. Jones	• In 1964, Ruth and John Jones purchased the 17.89-acre Project Area, on which they constructed the 1966 house (Figure 16). • John was born in 1917 in California, and Ruth was born in 1920 in California. Before their marriage, John was married to Emma Schneider, whom he married in 1940.[74] However, they divorced shortly after one year, and in 1942, John and Ruth married in Nevada when he was 25 years old and she was 22 years old.[75] John and Ruth had three children: Terry, Cheri, and Susan.[76] • In 1964, John and Ruth moved to Morgan Hill, established the Llagas Creek Christmas Tree Farm, and co-founded the Frazier Lake Airpark in Hollister.[77] During the Jones' ownership of the Project Area, John worked as the Deputy Fire Chief of Morgan Hill.[78] • John died in 1987.[79]
1988-1999	Owners: Ruth E. Jones Trust; Cheri Scales (née Jones), William Terry Jones, and Susan Lynn Raasch (née Jones).	• After John died, the terms of the will of John Jones will establish the Ruth E. Jones Trust, with Cheri Scales as the trustee. The Ruth E. Jones Trust listed an undivided ½ interest to Cheri, and the remaining 1/2 interest divided into one-sixth (1/6) interest among his children, Cheri Scales (née Jones), William Terry Jones, and Susan Lynn Raasch (née Jones). The trust provided no ownership of the property to Ruth. • Cherri was born in 1945 in California. In 1965, she married Benjamin T. Scales in Nevada.[80] Cheri and Ben lived in the 1966 house from 1989 to 2000.[81] No additional information about Cheri was found. • Terry was born in 1949 in California. Terry lived in the 1966 house from 1985 to 1992.[82] No additional information about Terry was found. • No information about Susan was found.

[74] Newspapers.com, "Young Couple to Pledge Vows at Baptist Church," *Salinas Morning Post*, October 05, 1940.
[75] Newspapers.com, "Nevada Marriage Licenses," *The Sacramento Bee*, May 04, 1942.
[76] Legacy.com, "Ruth Jones Obituary," https://www.legacy.com/us/obituaries/mercurynews/name/ruth-jones-obituary?id=27581634 (accessed March 26, 2024).
[77] Newspaper.com, "Cut your own tree this Christmas," *Los Gatos Times Saratoga Observer*, November 24, 1976.
[78] Ancestry.com. *U.S., World War II Draft Cards Young Men, 1940-1947.*
[79] Ancestry.com. *California, U.S., Death Index, 1940-1997*.
[80] Ancestry.com. *Carson City, Nevada, U.S., Marriage Index, 1855-1985*.
[81] Ancestry.com. *U.S., Index to Public Records, 1994-2019.*
[82] Ibid.

ca. 1883 barn, 1966 single-family house, ca. 1955 detached garage, and associated landscape		
Year(s)	**Owners/Occupants**	**Details**
		• In 1999, the Project Area was sold to Robin Bear.[83]
1999-2002	Owner: Robin A. Bear	• The next owner of the Project Area was Robin A. Bear. • No information about Robin was found.

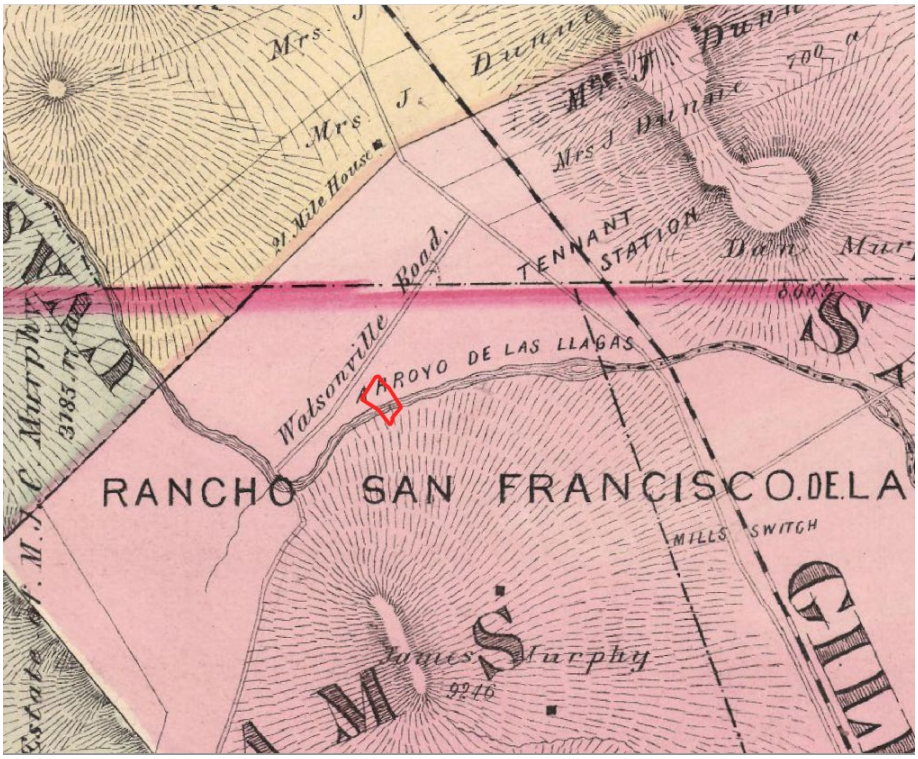

Figure 10. 1877 Thompson & West Historical Atlas of Santa Clara County with Property circled (courtesy of Archive.org).

[83] Santa Clara County Deed, 1999.

Figure 11. James Murphy, date unknown (courtesy of Findagrave.com).

Figure 12. Sketch of Ringwood Farm taken from the *Orchard School: A Narrative History*, by Richard Keller (Courtesy of orchardsd.org).

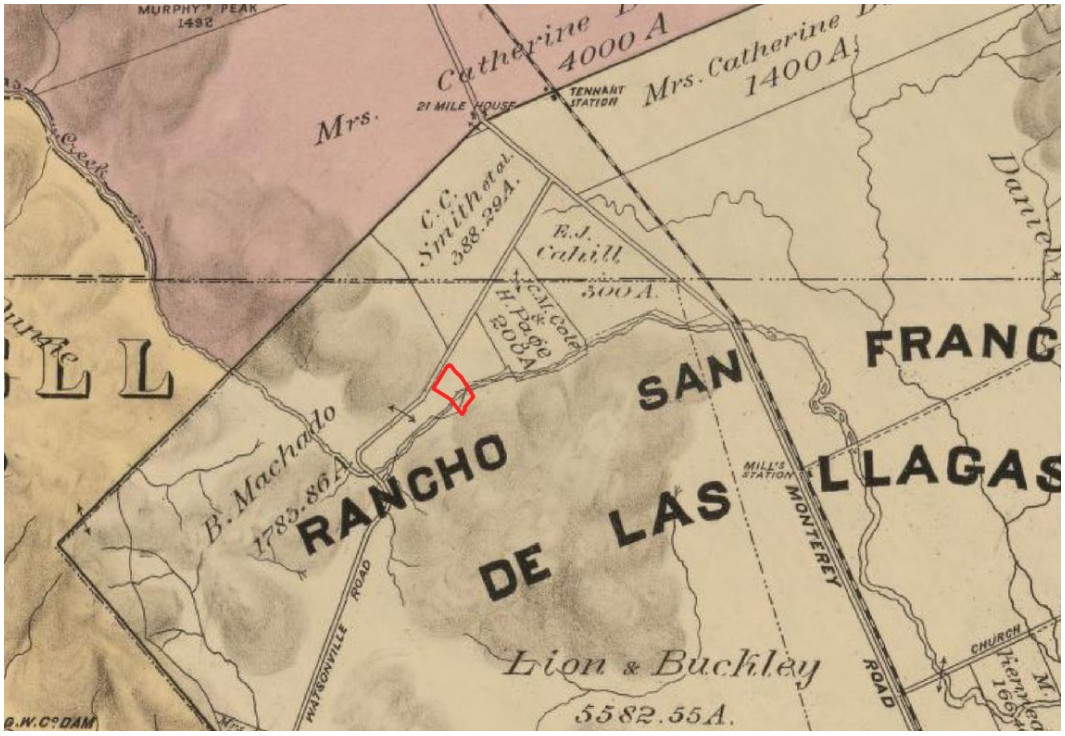

Figure 13. 1890 Hermann Brothers, Official Map of the County of Santa Clara California, showing the Project Area.

B. S. Machado is planting 2,000 fruit trees of various kinds, 800 being of fine peaches. Mr. Herrold, adjoining Mr. Machado, is planting 5,000 fruit trees on his ranch.—Gilroy Gazette.

Figure 14. Notice in *The Selma Irrigator*, dated March 16, 1895 (courtesy of newspapers.com).

Figure 15. HABS CA-2102 photograph of the northwest façade of the ca. 1895 Machado School on Sycamore Avenue in Morgan Hill Survey (courtesy of Library of Congress).[84]

Figure 16. 1966 aerial photograph of the Project Area (red boundary), including the ca. 1883 barn, ca. 1883 "Barney Machado house" (no longer extant; north of the barn), 1966 house (southeast of the barn), and ca. 1955 detached garage (south of the barn) (courtesy of UC Santa Barbara).

[84] Historic American Buildings Survey, Creator. *Machado School, Sycamore Avenue, Morgan Hill, Santa Clara County, CA*. Morgan Hill California Santa Clara County, 1933. Documentation Compiled After. Photograph. https://www.loc.gov/item/ca0938/.

ARCHITECTURAL STYLE

The following section briefly describes the architectural styles associated with the built environment resources within the Project Area. The ca. 1883 barn is associated with Vernacular architecture, the 1966 house is associated with Ranch architecture, and the ca. 1955 detached garage is not associated with an architectural style.

RANCH ARCHITECTURE (1930 - 1975)

The Ranch architectural style symbolizes a distinct historical period of unprecedented population growth, economic gains, and suburban and urban development during the mid-century. It provided a wide range of new, affordable, and desirable housing for many post-war families, as well as new designs and changes in the usage of interior and exterior spaces that integrated landscape into floorplans and the design of the new commercial buildings. Though not credited with inventing the style, noted twentieth-century Architect Cliff May was primarily responsible for popularizing the Ranch House style in America during the 1930s and 1940s, and he designed some of the most remarkable Ranch Houses in America. May worked closely with Sunset Magazine editors to publicize his ideas about the new Ranch House, and in collaboration with Sunset Magazine, he edited two popular publications about Ranch House design, which contained many of May's designs.

- One or two stories of asymmetrical forms, some with one or more wings
- Gabled roof with wide eaves with exposed rafter tails
- Exposed post and beam construction
- Attached garages, often forming one wing; gable and wing form
- Brick or stone chimneys
- Setting in close relationship to the associated landscape; integral landscape design
- Dutch doors, French doors, and sliding glass doors
- Shutters on houses and simple wood or metal hand-railing

VERNACULAR ARCHITECTURE

In architectural history, the definition of "vernacular" is not universally agreed on, and there are two main definitions, including an "ordinary" meaning where vernacular architecture is that which belongs to "a type that is common in a given area at a given time," and an emerging "regionalist" definition where "vernacular buildings are localized versions of widely known forms." Generally, Vernacular buildings are constructed by nonprofessionals and, in many cases, by the occupants.[85] Vernacular architecture is also characterized as a functional shelter for people, animals, and stores, "built to meet needs" and constructed according to the

[85] Thomas Carter and Bernard L. Herman, ed. *Perspectives in Vernacular Architecture, IV,* Columbia, MO: University of Missouri Press, 1991, 1.

availability and performance of materials and formed in response to environmental and climatic conditions. However, the term vernacular is carefully considered when evaluating buildings that appear to have "no style" or ones that do not fit the traditional known architectural styles. Whether the building was a thatched cottage, an early "pioneer" balloon-framed house, or a trailer park, vernacular architecture is typically defined as those outside the mainstream of professional architecture and based on local influences such as available materials and the environment. The term "vernacular architecture" is also applied to "everyday" forms such as barns that are set within agricultural landscapes and designed and constructed of materials that reflect regional and functional variations that help to convey specific significant design trends of a particular group of people or local industry.

HISTORIC ARCHITECTURAL SURVEY

On February 22, 2024, EDS Principal Architectural Historian Stacey De Shazo, M.A., completed a historic architectural survey of the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape within the 17.89-acre Project Area.

CA. 1883 BARN

The ca. 1883 barn is associated with Vernacular architecture (Figure 17). The one-and-a-half story barn has an original front-facing central gable form, with two wing shed additions added in ca. 1930 when the property was owned by Rasmus Christensen and Maria M. Christensen and used to house grazing animals, such as cows and sheep. The original central gable form is built on a raised wood platform, demonstrating some original materials, including machine-cut nails and long, narrow floorboards. The shed wing additions were constructed directly on the soil. The barn is clad with wide wood siding, installed vertically and horizontally. Oddly, this siding is connected to the walls of the gable section from the interior. Thus, the wall framing is exposed at the exterior, while the siding at the gable form and shed wing additions are installed from the exterior. There are also sections of horizontal shiplap siding and plywood. The roof is clad with corrugated metal sheets and appears to have been replaced.

Figure 17. ca. 1883 barn, facing southwest.

Northwest Elevation (Primary Façade)

The northwest elevation consists of the front-facing gable and two wings (Figure 18). The wings and gable have vertical siding, while the section below the gable has vertical siding. The easternmost half of the east wing is on hinges and operates as an access door into the wing (Figure 19). The gable section has a single square wood barn door on two hinges supported by cross-bracing. The westernmost section of the west wing has a double door consisting of two vertical siding doors with two hinges on each door.

Figure 18. Northwest and southwest elevations, facing east.

Figure 19. Northwest elevation, facing south.

Northeast Elevation

The northeast elevation consists of the eave end of the east shed addition (Figure 20). The easternmost corner of the barn has the siding removed, exposing the interior of the shed section (Figure 21). The eaves of the roof have visible exposed rafters.

Figure 20. Northeast elevation, facing southwest.

Figure 21. Northeast and southeast elevations, facing west.

Southeast Elevation

The southeast elevation consists of the rear front-facing-gable (Figure 22). The shed and gable sections are clad with vertical wood siding, while the wall below the gable has horizontal wood siding installed from the interior and has two infilled doorways. One infilled door has horizontal shiplap siding, while the other has plywood (Figure 23). Remnants of a roof addition, which currently only has the roof framing and two sheets of corrugated metal, are attached to the gable just below and are supported by two wood posts. As the siding at the original section of the barn is installed from the interior, the floorboards remain exposed to the elements, and deterioration of the wood is visible (Figure 24). These wood floorboards are installed on the mudsill with machine-cut nails (Figure 25).

Figure 22. Southeast elevation, facing northwest.

Figure 23. Southeast elevation, with exposed framing.

Figure 24. Deteriorating floorboards on the southeast elevation.

Figure 25. Deteriorating floorboards with machine-cut nails and exposed framing.

Southwest Elevation

The southwest elevation consists of the eave elevation of the barn (Figure 26). There is no fenestration or access from this elevation, and much of the siding on this elevation has been repaired with plywood sections, and the roof is missing several roofing sections (Figure 27).

Figure 26. Southwest elevation, facing northeast.

Figure 27. South corner, with vertical siding and roof joists.

Interior

The interior of the original front-facing central gable form shows the exterior siding installed on the interior and the exposed rafter joists, some of which have been removed without replacement, spanning the length of the original ca. 1883 front-facing gable form (Figure 28 and Figure 29). The interior also shows non-original roof framing and non-original corrugated metal sheets.

Figure 28. Interior of ca. 1883 barn, facing south.

Figure 29. Interior ca. 1883 barn.

1966 HOUSE

The 1966 house is associated with Ranch Architecture (Figure 30). The one-story house consists of a cross-gable form and T-shaped footprint. The building rests on a raised concrete foundation. The roof has a moderate pitch and is clad with asphalt composite shingles, with two plastic skylights on the north face of the roof. The house is clad with board and batten siding, with clapboard siding within the gables. The north elevation is the primary façade and consists of the eave elevation of the side-facing gable section of the

house (Figure 31). Two-thirds of the elevation steps back from the eave of the roof, which is supported by four wood posts and a pilaster, providing a covered walkway to the front door. Within this setback section of the house is a wood-paneled door with a screen door, two sliding aluminum windows, a single metal door, and an incorporated two-car, tilt-up canopy garage. There are two large sliding aluminum windows to the east of the door and within the elevation in line with the roof's eave (Figure 33). The west elevation consists of a side-facing gable and the eave wall of the south wing. Within the side-facing gable is a sliding aluminum window; the eave wall was not visible during the survey (Figure 32). At the peak of the gable is a rectangular wood vent. The east elevation consists of a side-facing gable and the eave wall of the south wing (Figure 33). The fenestration consists of two small sliding aluminum windows and a large sliding aluminum window (Figure 34). At the gable's peak is a rectangular wood vent, and along the foundation of the house, there are seven vents providing air circulation to the crawl space. While the eave wall of this elevation was not visible during the survey, a covered patio is built off the south elevation and is supported by wood posts and an x-frame built in line with the east elevation. The south elevation was not visible during the survey.

Figure 30. North and west elevations, facing southeast.

Figure 31. North elevation, facing south.

Figure 32. North and west elevations, facing southeast.

Figure 33. North and east elevations, facing southwest.

Figure 34. East elevation, facing west.

CA. 1955 DETACHED GARAGE

The ca. 1955 detached garage is not associated with an architectural style (Figure 35). The one-story building has a concrete slab-on-grade foundation with a rectangular footprint. The walls of the garage are clad with board and batten siding. The shed roof is clad with asphalt composite sheets, with thick trim along the perimeter. The eave of the northeast elevation has a wide eave overhang, while the remaining eaves have a moderate overhang. The northeast elevation is the primary façade, consisting of a carport-style

opening and a wide, single-wood door. The remaining elevations do not have any fenestration or character-defining features.

Figure 35. Northwest and northeast elevations, facing south.

ASSOCIATED LANDSCAPE

The associated landscape consists of remnants of a walnut orchard (approximately six rows and 20 trees remain), two redwood trees, and several pine and oak trees (Figure 36 and Figure 37). Much of the previous walnut orchard was likely planted in the late 1950s or early 1960s in an area that did not have any trees and is associated with a designed landscape or planned orchard (Figure 38). A dirt driveway bisects the property at the northeast boundary and extends to the center of the property, towards the ca. 1883 barn and then east towards the 1966 house. The portion of the interior driveway from the ca. 1883 barn and the 1966 house consists of a three-rail wooden fence, which appears to have been added in the late 1960s or 1970s. The Project Area is also bounded by a new chain link fence (Figure 39). There are no remnants of the former Machado peach orchard.

Figure 36. Remnants of the walnut orchard near the 1966 house, facing south.

Figure 37. Remnants of the walnut orchard.

Figure 38. Pasture between the ca. 1883 barn and ca. 1955 detached garage.

Figure 39. Driveway leading to 1966 house, facing southeast.

EVALUATION FOR HISTORICAL SIGNIFICANCE

The ca. 1883 barn is currently considered a historical resource under CEQA due to its local listing; however, due to issues with the previous documentation and evaluations, the ca. 1883 barn was re-evaluated, and the 1966 house, ca. 1955 detached garage, and associated landscape were evaluated for individual historical significance following the CRHR criteria.

The HRE found that the Project Area is associated with Martin Murphy Jr. and James Murphy from 1868 to ca. 1883 and with Bernard "Barney" Machado and his wife Mary Machado from ca. 1883 to 1908. In addition, the ca. 1883 barn is associated with Vernacular Architecture, with a period of significance of ca. 1883, the estimated year the building was constructed. The 1966 house is associated with Ranch Architecture, with a period of significance of 1966, the year the building was constructed; and the ca. 1955 detached garage is not associated with an architectural style.

The associated landscape is not associated with any planned or designed landscape.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The CRHR is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the CRHR through several methods. State Historical Landmarks and NRHP-listed properties are automatically listed in the CRHR. Properties can also be nominated to the CRHR by local governments, private organizations, or citizens. The CRHR follows *similar* guidelines to those used for the NRHP. One difference is that the CRHR identifies the Criteria for Evaluation numerically instead of alphabetically. Another difference, according to the OHP, is that "It is possible that historical resources may not retain sufficient integrity to meet the criteria for listing in the NRHP, but they may still be eligible for listing in the California Register. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register if it maintains the potential to yield significant scientific or historical information or specific data."[86]

For a property to qualify for listing in the CRHR, it must possess significance under one of the four criteria and have historic integrity. The process of determining integrity consists of evaluating seven variables or aspects including location, design, setting, materials, workmanship, feeling, and association. According to the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*, these seven characteristics are defined as follows:

- **Location** is the place where the historic property was constructed.
- **Design** is the combination of elements that create the form, plans, space, structure, and style of the property.
- **Setting** addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the building(s).
- **Materials** refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property.
- **Workmanship** is the physical evidence of the crafts of a particular culture or people during any given period in history.
- **Feeling** is the property's expression of the aesthetic or historic sense of a particular period of time.

[86] California Office of Historic Preservation Technical Assistance Series #6 California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register).

- **Association** is the direct link between an important historic event or person and historic property.

The following section examines the eligibility of built environment resources within the Project Area for individual listing on the CRHR.

CRHR EVALUATION

1. **(Event): Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.**

   The Project Area, including the ca. 1883 barn, 1966 house, ca. 1955 detached house, and the associated landscape, was not found to be associated with any events that made a significant contribution to the broad patterns of California's history or cultural heritage.

   Therefore, the Project Area is not individually eligible for listing in the CRHR under Criterion 1.

2. **(Person): Is associated with the lives of persons important in our past.**

   Murphy Family: The Project Area was once part of the 22,283-acre Rancho San Francisco de las Llagas, owned by brothers Martin Murphy Jr. and James Murphy.[87] The brothers were part of the pioneer Murphy family and the first wagon party, the Stephens-Townsend-Murphy Party, to arrive in California via the Sierra Nevada route. Although the Murphy family were early California pioneers, and James Murphy, as well as other Murphy family members, did make a significant impact on California and local history, neither James nor any members of the Murphy family lived within or utilized any of the current built environment or associated landscape within the Project Area.

   Bernard "Barney" Machado: It appears that the ca. 1883 barn within the Project Area was first associated with Bernard "Barney" Machado, the son-in-law of James Murphy. While Bernard Machado was a farmer and appears to have lived within the former house within the Project Area, he is not considered an important person in California history. However, locally, he was a known peach orchard farmer, and he and his wife Mary are most notably known for their land donations to the City of Morgan Hill and their monetary donation for the construction of the Machado School in 1895. However, as detailed in the section below, the ca. 1883 barn and the 17.89-acre portion of the much larger farmland associated with Bernardo and Mary Machado has changed significantly and no longer retains integrity to convey association with Bernard or Mary Machado.

   Therefore, the Project Area does not appear individually eligible for listing in the CRHR under Criterion 2.

3. **(Construction/Architecture): Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.**

[87] James J. Ayers, *Report of the Surveyor-General of the State of California from August 1, 1884, to August 1, 1886,* (Sacramento, CA: 1886) 22.

Vernacular Architecture: The ca. 1883 barn is associated with Vernacular Architecture, with a period of significance of ca. 1883, the estimated year the barn was constructed. The ca. 1883 barn was initially a front-facing gable form but currently consists of a front-facing gable with shed wing additions. While the original ca. 1883 front-facing gable form is associated with Vernacular Architecture, the ca. 1930 wing shed additions and other alterations to the barn changed the barn from fruit farming to housing grazing animals, such as cattle and sheep. As such, the additions represent a later use. As detailed in the integrity section below, the ca. 1883 barn no longer retains integrity as a representative example of a Vernacular building associated with orchard farming in ca. 1883. In addition, the barn is not constructed in a Vernacular style specific to Morgan Hill or local agriculture. Therefore, the ca. 1883 barn is not eligible for listing on the CRHR under Criterion 3.

Ranch Architecture: The 1966 house is associated with Ranch Architecture, with a period of significance of 1966, the year the house was constructed. The 1966 house displays the form and material found within Ranch architecture, which includes the side-facing gable, low-profile form, off-centered door, attached garage, and board and batten siding with aluminum windows. However, despite its association with this architectural style, the house is a simple example of Ranch Architecture and is not representative of the design. Furthermore, it was not designed by a known builder or master architect. Therefore, it is not eligible for listing on the CRHR under Criterion 3

Although the property consists of remnants of a walnut orchard, the National Park Service (NPS), "Research and Documentation of Historic Orchards and Fruit Trees," states that "Frequently, orchards or fruit trees in the NPS are recognized as historically important features for their contribution to the significance and integrity of larger sites or historic districts that are listed in the National Register of Historic Places." Based on the guidance by the NPS and the absence of a planned design, the remnants of the walnut orchard were not found to be individually significant or associated with a district. The ca. 1955 detached garage is not associated with any architectural style or landscape.

In summary, the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape within the Project Area do not appear eligible for listing on the CRHR under Criterion 3. The ca. 1883 barn also does not retain integrity to convey local significance.

4. **(Information potential): Has yielded, or may be likely to yield, information important in prehistory or history.**

Criterion 4 most commonly applies to resources that contain or are likely to contain information bearing on an important archaeological research question. While most often applied to archaeological sites, Criterion 4 can also apply to buildings that contain important information. For a building to be eligible under Criterion 4, it must be a principal source of important information, such as exhibiting a local variation on a standard design or construction technique can be eligible if a study can yield important information, such as how local availability of materials or construction expertise affected the evolution of local building development.

The ca. 1883 barn, though associated with Vernacular architecture, does not have the ability to convey information about the history of Vernacular design, and the 1966 house, which is associated with Ranch Architecture, does not have the ability to convey information about the history of Ranch design. Therefore, the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape within the Project Area are not eligible for listing in the CRHR under Criterion 4.

INTEGRITY

A property must possess significance under one or more of the above-listed criteria and have historic integrity to qualify for listing in the CRHR. Seven variables, or aspects, are used to judge historic integrity, including location, design, setting, materials, workmanship, feeling, and association.[88] A resource must possess the aspects of integrity that relate to the historical theme(s) and period of significance identified for the built-environment resources. National Register Bulletin 15 explains, "Only after significance is fully established can you proceed to the issue of integrity."

The section below assesses the integrity of the ca. 1883 barn associated with Vernacular Architecture, which appears eligible under Criterion 3 with a period of significance of ca. 1883. In addition, EDS assessed the integrity of the 17.89-acre Project Area for association with Bernard and Mary Machado to assist the City of Morgan Hill to better understand the integrity of the property's association with Bernard and Mary Machado between ca. 1883 and 1908.

- **Location.** The ca. 1883 barn remains at its original location where it was constructed.

  Therefore, ca. 1883 barn retains integrity of the location.

- **Design**. The ca. 1883 barn has undergone several alterations that significantly altered the original design. The barn originally had a front-facing gable form and a wood-on-grade foundation. By ca. 1930, shed wings were added to the eave elevations of the barn, and all the siding was removed and replaced in either a different location on the barn or removed entirely. In addition, new siding was added, and openings or windows appear to have been covered up to accommodate the new use as a cattle or sheep barn, and a new roof was constructed on the original form. Only the front-facing gable form remains from the original ca. 1883 design. In addition, the alterations changed the design of the building as it appeared during the time it was associated with Bernard and Mary Machado.

  Therefore, the barn does not retain integrity of design from ca. 1883 or from the time Bernard and Mary Machado owned the property from ca. 1883 to 1908.

- **Setting.** The setting of the ca. 1883 barn has changed significantly due to the lack of the Barney Machado house, the change in use of the property, which has more recently been used for passive sheep grazing and as a Christmas tree lot, and development of the surrounding neighborhoods. Although a walnut orchard is present, the original property was planted in peach trees when the ca.

[88] National Park Service, *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: United States Department of the Interior, 1997).

1883 barn was constructed.

Therefore, neither the ca. 1883 barn nor the Project Area retain integrity of setting.

- **Materials**. The ca. 1883 barn has undergone several significant renovations and, as such, only retains the original platform floor and some framing of the original front-facing gable form. The remaining materials, including the sections of exterior walls, the wing additions, and the roof are not original to ca. 1883, and were added in ca. 1930 or later.

  Therefore, the ca. 1883 barn does not retain integrity of materials from ca. 1883.

- **Workmanship.** Workmanship is evidenced by skill or craft from a particular period or region. Over 60% of the ca. 1883 barn has been altered in a make-shift way utilizing re-used or alternative materials, and, as such, it retains very little evidence of workmanship associated with its ca. 1883 construction.

  Therefore, the ca. 1883 barn does not retain integrity of workmanship from ca. 1883.

- **Feeling**. Integrity of feeling is the quality that a historic property has in evoking the aesthetic or historical sense of a past period. Due to significant alterations, the ca. 1883 barn does not convey the feeling of a barn used for orchard farming in the late 1800s and early 1900s. In addition, the feeling of the surrounding landscape has changed significantly with the addition of the construction of the 1966 house and ca. 1955 detached garage and the removal of the peach trees. Although, the land has the feeling of a former farm, the removal of the original Barney Machado house and the lack of an organized and maintained fruit orchard significantly limits integrity of feeling associated with Bernard and Mary Machado.

  Therefore, the ca. 1883 barn does not retain integrity of feeling from ca. 1883 or from the time Bernard and Mary Machado owned the property from ca. 1883 to 1908.

- **Association.** The ca. 1883 barn is associated with Vernacular Architecture from ca. 1883, and the property is associated with Bernard and Mary Machado; however, due to the alterations to the ca. 1883 barn, it does not retain association with Vernacular Architecture from ca. 1883. In addition, significant changes to the property, including reduction of the size or the original property owned by the Machados, removal of the peach trees, and demolition of the Barney Machado house, the current 17.89-acre Project Area does not retain an association with Bernard or Mary Machado and his agricultural pursuits.

  Therefore, the ca. 1883 barn does not retain integrity of association from ca. 1883, nor does the Project Area retain association with Bernard and Mary Machado from ca. 1883 to 1908.

Integrity Assessment

The integrity assessment found that the ca. 1883 barn does not retain enough integrity to convey the historical significance associated with the Vernacular Architecture from ca. 1883 nor for its association with Bernard and Mary Machado.

CONCLUSIONS

EDS completed an HRE of the built environment resources within the Project Area, including the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape, to determine if the Project Area or any of the built environment resources within the Project Area over 45 years of age are individually eligible for listing on the CRHR and if the Project would have an adverse impact on historical resources(14 CCR § 15064.5 and PRC § 21084.1). The HRE was completed by EDS Principal Architectural Historian Stacey De Shazo, M.A. and Architectural Historian Nicole LaRochelle, M.S., both of whom exceed the Secretary of the Interior's qualification standards in Architectural History and History, and researcher Bee Thao, M.A.

The HRE determined that the Project Area and none of the built environment resources, including the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape, within the Project Area, are eligible for listing on the CRHR under any criterion. As such, the Project will not impact any CRHR-eligible built environment resources.

LOCAL LISTING SUMMARY AND RECOMMENDATIONS

Due to its listing on the County of Santa Clara Heritage Resource Inventory (also known as the Heritage Resource Inventory list; updated May 16, 2023), the ca. 1889 "Barney Machado Barn" is considered a historical resource under CEQA. However, due to inaccuracies in the previous documentation and evaluation of the barn (detailed within this HRE), including the history, associated style, date of construction, and lack of an integrity analysis, the HRE and updated DPR 523 forms provide the City of Morgan Hill with the preponderance of evidence that demonstrates the barn is not historically significant and should not be treated as a historical resources in accordance with CCR 1564.5. As such, EDS recommends to the city request that the County of Santa Clara remove the ca. 1883 "Barney Machado Barn" from the County of Santa Clara Heritage Resource Inventory. If it is removed, it will not be considered a historical resource.

In addition, although not eligible under any CRHR-criterion, CIRCA, in their 2012 HRE of the "1868 Barney Machado Barn" recognized that the two Redwood trees may be considered an important local element that is attributed to being planted by Mary Machado. Although this could be the case, there is no primary or secondary source documentation or citations within any of the previous documentation of the Project Area that would confirm the Redwood trees were planted by Mary Machado and are associated with the Machado family.

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Appendix A:

DPR 523 Forms

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 5B ("Barney Machado Barn"); 6Z

Other Listings
Review Code Reviewer Date

Page 1 **of** 22 ***Resource Name or #:** 14905 Santa Teresa Boulevard
P1. Other Identifier:

*__P2.__ **Location:** ☐ **Not for Publication** ☒ **Unrestricted**

***a. County** Santa Clara **and**

***b. USGS 7.5' Quad** Mt. Madona **Date** 1994 **T** 9S ; **R** 3E ; ☐ **of** ☐ **of Sec** un ; M.D. **B.M.**

c. Address 14905 Santa Teresa Boulevard City Morgan Hill Zip 95037

d. UTM: Zone 10S, 620404 mE/ 4105888 mN

e. Other Locational Data: The resource is located within the 17.89-acre parcel (APN 779-02-023) at the south corner of the intersection of Watsonville Road and Santa Teresa Boulevard in the town of Morgan Hill. The property is approximately 0.1 southeast of Llagas Creek and 1.96 miles northeast of Highway 101.

***P3a. Description:** The resource includes a ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape.
(Continued on Continuation Sheet, Page 3)

P5a.

***P3b. Resource Attributes:** HP33. Farm/Ranch (ca. 1883 barn) HP2. Single Family Property (1966 house); HP4. Ancillary Building (ca. 1955 detached garage)

***P4. Resources Present:** ☒ Building ☐Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other ca. 1883 barn, 1966 house, and ca. 1955 detached house, and associated landscape

P5b. Description of Photo ca. 1883 barn, facing west

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both ca. 1883 barn, 1966 house, and ca. 1955 detached house, various sources.

***P7. Owner and Address:** Withheld by owner

***P8. Recorded by:** Stacey De Shazo, M.A., Evans & De Shazo, Inc., 1141 Gravenstein Highway S, Sebastopol, CA 95472

***P9. Date Recorded:** 02/22/2024 ***P10. Survey Type:** Intensive

***P11. Report Citation:** Stacey De Shazo, and Nicole LaRochelle, with Bee Thao (2024): A Historic Resource Evaluation for the Blackrock (Quail Vineyards) Project at 14905 Santa Teresa Boulevard, Morgan Hill, Santa Clara County, California.

***Attachments:** ☐NONE ☒Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): ☒Sketch Map

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** 14905 Santa Teresa Boulevard ***NRHP Status Code** 5B ("Barney Machado Barn"); 6Z
Page 2 **of** 22

B1. Historic Name: Barney Machado Ranch
B2. Common Name:
B3. Original Use: Farm/Ranch B4. Present Use: Residential ***B5. Architectural Style:** Ranch/Vernacular
***B6. Construction History:** The barn was constructed in ca. 1883 by Bernard "Barney" Machado for fruit farming. In ca. 1930 the shed wing additions were added to the west and east elevations of the barn, likely constructed by the owner at the time, Rasmus Christensen. The additional renovations, such as the removal of the siding from the exterior and reinstallation within the interior, likely happened in the 1960s or 1970s, though this could have happened at a later time. The house was constructed in 1966 and has not been altered.

***B7. Moved?** ☒**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:** Yes
***B8. Related Features:** ca. 1955 detached garage, and associated landscape
B9a. Architect: Unknown b. Builder: Unknown
***B10. Significance: Theme** Person: Bernard and Mary Machado/Architecture: Vernacular and Ranch Architecture **Area** Morgan Hill **Period of Significance** ca. 1883-1906 (person); ca. 1883 (Vernacular) /1966 (Ranch)
Property Type Farm/Ranch **Applicable Criteria** 2 and 3

(Continued on Continuation Sheet Page 18)

B11. Additional Resource Attributes: N/A

***B12. References:**

National Park Service, National Register Bulletin: How to Apply the National Register Criteria for Evaluation (Washington, D.C.: United States Department of the Interior, 1997).

B13. Remarks: N/A

***B14. Evaluator:** Stacey De Shazo, M.A. Principal Architectural Historian, and Nicole LaRochelle, M.S., Architectural Historian; Evans & De Shazo, Inc.

***Date of Evaluation:** 02/22/2024
C

(This space reserved for official comments.)

(Continued from Primary Record, Page 1)

ca. 1883 Barn

The ca. 1883 barn is associated with Vernacular architecture (Figure 1). The one-and-a-half story barn has an original front-facing central gable form, with two wing shed additions added in ca. 1930 when the property was owned by Rasmus Christensen and Maria M. Christensen and used to house grazing animals, such as cows and sheep. The original central gable form is built on a raised wood platform, demonstrating some original materials, including machine-cut nails and long, narrow floorboards. The shed wing additions were constructed directly on the soil. The barn is clad with wide wood siding, installed vertically and horizontally. Oddly, this siding is connected to the walls of the gable section from the interior. Thus, the wall framing is exposed at the exterior, while the siding at the gable form and shed wing additions are installed from the exterior. There are also sections of horizontal shiplap siding and plywood. The roof is clad with corrugated metal sheets and appears to have been replaced.

Figure 1. ca. 1883 barn, facing southwest.

Northwest Elevation (Primary Façade)

The northwest elevation consists of the front-facing gable and two wings (Figure 2). The wings and gable have vertical siding, while the section below the gable has vertical siding. The easternmost half of the east wing is on hinges and operates as an access door into the wing (Figure 3). The gable section has a single square wood barn door on two hinges supported by cross-bracing. The westernmost section of the west wing has a double door consisting of two vertical siding doors with two hinges on each door.

Figure 2. Northwest and southwest elevations, facing east.

Figure 3. Northwest elevation, facing south.

Northeast Elevation

The northeast elevation consists of the eave end of the east shed addition (Figure 4). The easternmost

corner of the barn has the siding removed, exposing the interior of the shed section (Figure 5). The eaves of the roof have visible exposed rafters.

Figure 4. Northeast elevation, facing southwest.

Figure 5. Northeast and southeast elevations, facing west.

Southeast Elevation

The southeast elevation consists of the rear front-facing-gable (Figure 6). The shed and gable sections are clad with vertical wood siding, while the wall below the gable has horizontal wood siding installed from the interior and has two infilled doorways. One infilled door has horizontal shiplap siding, while the other has plywood (Figure 7). Remnants of a roof addition, which currently only has the roof framing and two sheets of corrugated metal, are attached to the gable just below and are supported by two wood posts. As the siding at the original section of the barn is installed from the interior, the floorboards remain exposed to the elements, and deterioration of the wood is visible (Figure 8). These wood floorboards are installed on the mudsill with machine-cut nails (Figure 9).

Figure 6. Southeast elevation, facing northwest.

Figure 7. Southeast elevation, with exposed framing.

Figure 8. Deteriorating floorboards on the southeast elevation.

Figure 9. Deteriorating floorboards with machine-cut nails and exposed framing.

Southwest Elevation

The southwest elevation consists of the eave elevation of the barn (Figure 10). There is no fenestration or access from this elevation, and much of the siding on this elevation has been repaired with plywood sections, and the roof is missing several roofing sections (Figure 11).

Figure 10. Southwest elevation, facing northeast.

Figure 11. South corner, with vertical siding and roof joists.

Interior

The interior of the original front-facing central gable form shows the exterior siding installed on the

interior and the exposed rafter joists, some of which have been removed without replacement, spanning the length of the original ca. 1883 front-facing gable form (Figure 12 and Figure 13). The interior also shows non-original roof framing and non-original corrugated metal sheets.

Figure 12. Interior of ca. 1883 barn, facing south.

Figure 13. Interior ca. 1883 barn.

1966 House

The 1966 house is associated with Ranch Architecture (Figure 14). The one-story house consists of a cross-gable form and T-shaped footprint. The building rests on a raised concrete foundation. The roof has a moderate pitch and is clad with asphalt composite shingles, with two plastic skylights on the north face of the roof. The house is clad with board and batten siding, with clapboard siding within the gables. The north elevation is the primary façade and consists of the eave elevation of the side-facing gable section of the house (Figure 15). Two-thirds of the elevation steps back from the eave of the roof, which is supported by four wood posts and a pilaster, providing a covered walkway to the front door. Within this setback section of the house is a wood-paneled door with a screen door, two sliding aluminum windows, a single metal door, and an incorporated two-car, tilt-up canopy garage. There are two large sliding aluminum windows to the east of the door and within the elevation in line with the roof's eave (Figure 17). The west elevation consists of a side-facing gable and the eave wall of the south wing. Within the side-facing gable is a sliding aluminum window; the eave wall was not visible during the survey (Figure 16). At the peak of the gable is a rectangular wood vent. The east elevation consists of a side-facing gable and the eave wall of the south wing (Figure 17). The fenestration consists of two small sliding aluminum windows and a large sliding aluminum window (Figure 18). At the gable's peak is a rectangular wood vent, and along the foundation of the house, there are seven vents providing air circulation to the crawl space. While the eave wall of this elevation was not visible during the survey, a covered patio is built off the south elevation and is supported by wood posts and an x-frame built in line

with the east elevation. The south elevation was not visible during the survey.

Figure 14. North and west elevations, facing southeast.

Figure 15. North elevation, facing south.

Figure 16. North and west elevations, facing southeast.

Figure 17. North and east elevations, facing southwest.

Figure 18. East elevation, facing west.

ca. 1955 Detached Garage

The ca. 1955 detached garage is not associated with an architectural style (Figure 19). The one-story building has a concrete slab-on-grade foundation with a rectangular footprint. The walls of the garage are clad with board and batten siding. The shed roof is clad with asphalt composite sheets, with thick trim along the perimeter. The eave of the northeast elevation has a wide eave overhang, while the remaining eaves have a moderate overhang. The northeast elevation is the primary façade, consisting of a carport-style opening and a wide, single-wood door. The remaining elevations do not have any fenestration or character-defining features.

Figure 19. Northwest and northeast elevations, facing south.

Associated Landscape

The associated landscape consists of remnants of a walnut orchard (approximately six rows and 20 trees remain), two redwood trees, and several pine and oak trees (Figure 20 and Figure 21). Much of the previous walnut orchard was likely planted in the late 1950s or early 1960s in an area that did not have any trees and is not associated with a designed landscape or planned orchard (Figure 22). A dirt driveway bisects the property at the northeast boundary and extends to the center of the property, towards the ca. 1883 barn and then east towards the 1966 house. The portion of the interior driveway from the ca. 1883 barn and the 1966 house consists of a three-rail wooden fence, which appears to have been added in the late 1960s or 1970s. The property is also bounded by a new chain link fence (Figure 23). There are no remnants of the former Machado peach orchard.

Figure 20. Remnants of the walnut orchard near the 1966 house, facing south.

Figure 21. Remnants of the walnut orchard.

Figure 22. Pasture between the ca. 1883 barn and ca. 1955 detached garage.

Figure 23. Driveway leading to 1966 house, facing southeast.

Continued from BSO, Page 2, Section B10

- Criterion 2: The property is associated with Martin Murphy Jr. and James Murphy from 1868 to ca. 1883 and with Bernard "Barney" Machado and his wife Mary Machado from ca. 1883 to 1908.
- Criterion 3: The ca. 1883 barn is associated with Vernacular Architecture, with a period of significance of ca. 1883, the estimated year the building was constructed.
- Criterion 3: The 1966 house is associated with Ranch Architecture, with a period of significance of 1966, the year the building was constructed.

California Register of Historical Resources (CRHR) Evaluation

1. **(Event): Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.**

   The property, including the ca. 1883 barn, 1966 house, ca. 1955 detached house, and the associated landscape, was not found to be associated with any events that made a significant contribution to the broad patterns of California's history or cultural heritage.

   Therefore, the property is not individually eligible for listing in the CRHR under Criterion 1.

2. **(Person): Is associated with the lives of persons important in our past.**

   Murphy Family: The property was once part of the 22,283-acre Rancho San Francisco de las Llagas, owned by brothers Martin Murphy Jr. and James Murphy.[1] The brothers were part of the pioneer Murphy family and the first wagon party, the Stephens-Townsend-Murphy Party, to arrive in California via the Sierra Nevada route. Although the Murphy family were early California pioneers, and James Murphy and other Murphy family members made a significant impact on California and local history, neither James nor any members of the Murphy family lived within or utilized any of the current built environment or associated landscape within the property.

   Bernard "Barney" Machado: It appears that the ca. 1883 barn within the property was first associated with Bernard "Barney" Machado, the son-in-law of James Murphy. While Bernard Machado was a farmer and appears to have lived within the former house within the property, he is not considered an important person in California history. However, locally, he was a known peach orchard farmer, and he and his wife Mary are most notable for their land donations to the City of Morgan Hill and their monetary donation for the construction of the

[1] James J. Ayers, *Report of the Surveyor-General of the State of California from August 1, 1884, to August 1, 1886,* (Sacramento, CA: 1886) 22.

Machado School in 1895. However, as detailed in the section below, the ca. 1883 barn and the 17.89-acre portion of the much larger farmland associated with Bernardo and Mary Machado has changed significantly and no longer retains integrity to convey association with Bernard or Mary Machado, particularly since the Machado house formerly located within the property is no longer present.

Therefore, the property does not appear individually eligible for listing in the CRHR under Criterion 2.

3. **(Construction/Architecture): Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.**

Vernacular Architecture: The ca. 1883 barn is associated with Vernacular Architecture, with a period of significance of ca. 1883, the estimated year the barn was constructed. The ca. 1883 barn was initially a front-facing gable form but currently consists of a front-facing gable with shed wing additions. While the original ca. 1883 front-facing gable form is associated with Vernacular Architecture, the ca. 1930 wing shed additions and other alterations to the barn changed the barn's use from fruit farming to housing grazing animals, such as cattle and sheep. As such, the additions represent a later use. As detailed in the integrity section below, the ca. 1883 barn no longer retains integrity as a representative example of a Vernacular building associated with orchard farming in ca. 1883. In addition, the barn is not constructed in a Vernacular style specific to Morgan Hill or local agriculture. Therefore, the ca. 1883 barn is not eligible for listing on the CRHR under Criterion 3.

Ranch Architecture: The 1966 house is associated with Ranch Architecture, with a period of significance of 1966, the year the house was constructed. The 1966 house displays the form and material found within Ranch architecture, which includes the side-facing gable, low-profile form, off-centered door, attached garage, and board and batten siding with aluminum windows. However, despite its association with this architectural style, the house is a simple example of Ranch Architecture and is not representative of the design. Furthermore, it was not designed by a known builder or master architect. Therefore, it is not eligible for listing on the CRHR under Criterion 3

Although the property consists of remnants of a walnut orchard, the National Park Service (NPS), "Research and Documentation of Historic Orchards and Fruit Trees," states that "Frequently, orchards or fruit trees in the NPS are recognized as historically important features for their contribution to the significance and integrity of larger sites or historic districts that are

listed in the National Register of Historic Places."[2] Based on the guidance by the NPS,[3] and the absence of planned design, the remnants of the walnut orchard were not found to be individually significant or associated with a district.

The ca. 1955 detached garage is not associated with any architectural style or landscape.

In summary, the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape within the property do not appear eligible for listing on the CRHR under Criterion 3.

4. **(Information potential): Has yielded, or may be likely to yield, information important in prehistory or history.**

Criterion 4 most commonly applies to resources that contain or are likely to contain information bearing on an important archaeological research question. While most often applied to archaeological sites, Criterion 4 can also apply to buildings that contain important information. For a building to be eligible under Criterion 4, it must be a principal source of important information, such as exhibiting a local variation on a standard design or construction technique can be eligible if a study can yield important information, such as how local availability of materials or construction expertise affected the evolution of local building development.

The ca. 1883 barn, though associated with Vernacular architecture, does not have the ability to convey information about the history of Vernacular design, and the 1966 house, which is associated with Ranch Architecture, does not have the ability to convey information about the history of Ranch design. Therefore, the ca. 1883 barn, 1966 house, ca. 1955 detached garage, and associated landscape within the property are not eligible for listing in the CRHR under Criterion 4.

[2] National Park Service, "Research and Documentation of Historic Orchards and Fruit Trees," accessed April 1, 2024.

[3] Susan A. Dolan, "Fruitful Legacy: A Historic Context of Orchards in the United States, with Technical Information for Registering Orchards in the National Register of Historic Places." 2009.

***Drawn by:** Sally Evans, Evans & De Shazo, Inc. ***Date of map:** 04/06/2024

ca. 1883 Barn, 1966 House, ca. 1955 Detached Garage, and Associated Landscape
14905 Santa Teresa Boulevard
Morgan Hill, Santa Clara County, CA
(APN 779-02-023)

0 250 500 Feet

Legend
Resource Area
Creeks

N

EVANS & DE SHAZO
ARCHAEOLOGY HISTORIC PRESERVATION

Map by: S. Evans, 4/6/2024

DPR 523K (Rev. 1/1995)(Word 9/2013) NOTE: Include bar scale and north arrow.

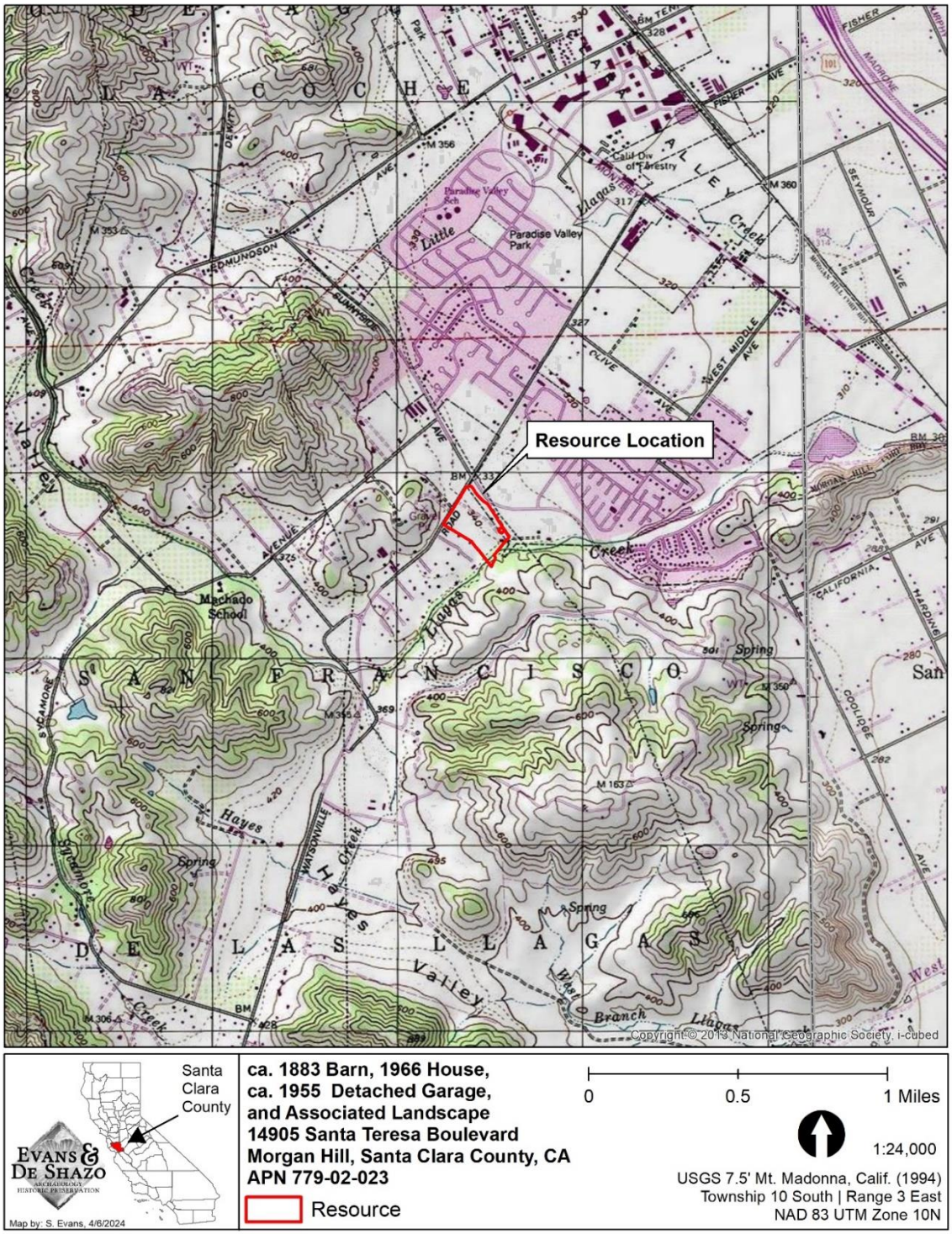
State of California Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

***Resource Name or #** 14905 Santa Teresa Boulevard

***Map Name:** USGS 7'5 Quad Mt. Madonna ***Scale:** 1:24,000 ***Date of map:** 1994



Appendix B:

Urban Programmers 2022

From: Brenda Walstra
To: Gina Paolini
Subject: [EXTERNAL] Blackrock - 14905Santa Teresa Blvd. Morgan Hill
Date: Thursday, November 3, 2022 8:24:10 AM

Good morning Gina,

The below email is regarding the barn. Please call Vince regarding this.

Brenda Walstra

From: Vincent Burgos <vrburgos@hotmail.com>
Sent: Wednesday, November 2, 2022 5:01 PM
To: Brenda Walstra
Subject: Fwd: 14905Santa Teresa Blvd. Morgan Hill

Sent from my iPad

Begin forwarded message:

From: BONNIE BAMBURG <bbamburg@usa.net>
Date: November 2, 2022 at 4:41:45 PM PDT
To: Vince Burgos <vrburgos@hotmail.com>
Subject: 14905Santa Teresa Blvd. Morgan Hill

This email is to inform you on the progress to "update" the historical and architectural information that has been put forward on a DPR 523 by Dill Design Associates in 2003 and repeated in a subsequent Historical/Architectural evaluation by Circa Development Group, 2013. Urban programmers conducted a site visit and was surprised to find the extant barn, although shown in the DPR was quite different than the description. Upon a quick check of historical sources Urban Programmers determined the historical information on the DPR was not factual and lead to a conclusion that the barn dated from 1868 which is not backed up by our research. I spoke with Charlene Duval, the historian listed in the 2003 DPR and described our findings. She did some quick research and concluded there was no citation for the 1868 date or that Bernard Machado resided at this location in the 1860s. We have requested early survey forms or other documents that may show the source for the history and dates put forward

through several iterations but have not received the information.

The site inspection was initially to determine if the barn could be moved and retain the character defining features of a 1868 barn. Our conclusion is that the barn cannot be moved and retain the features of even a 1890s, barn (which it appears to be) This conclusion is based upon the condition of the structure and the many alterations that have weakened the structure and changed the original materials. To move the barn would require extensive new structural members including rafters to support the roof. Horizontal and vertical boards would have to be added to provide strength. This was the observation of Marvin A. Bamburg, AIA, Historic Architect who has a degree in Architectural Engineering.
We would like at least a week to conclude research and provide the "update" to the existing DPR 523.

Sincerely,

Bonnie Bamburg
Historic Preservation Consultant
Urban Programmers
10710 Ridgeview Ave.
San Jose CA 95127
408-254-7171

bbamburg@usa.net

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Appendix E

Geologic Hazards Evaluation and Soil Engineering Study

GEOLOGIC HAZARDS EVALUATION AND
SOIL ENGINEERING STUDY
QUAIL VINEYARDS SUBDIVISION
14905 SANTA TERESA BOULEVARD
MORGAN HILL, CALIFORNIA

September 14, 2012

Prepared for

Blackrock, LLC

Prepared by

Earth Systems Pacific
780 Montague Expressway, #205
San Jose, CA 95131

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September 14, 2012 File No. SH-11788-SA

Blackrock, LLC
14656 Stonebridge Drive
Morgan Hill, CA 95037

Attention: Mr. Doug Blackwell

Project: **Proposed Quail Vineyards Subdivision on 16.30 Acre Site**
APN 779-02-023
Santa Teresa Blvd & Watsonville Road
Unincorporated Morgan Hill, Santa Clara County, California

Subject: **Geologic Hazards Evaluation and Soil Engineering Study**

Reference: Proposal for a Geologic Hazards Evaluation and Liquefaction Analysis Plus Soil Engineering Study, Proposed Residential Subdivision on 16.30 Acre Site, APN 779-02-023, Santa Teresa Blvd & Watsonville Road, Unincorporated Morgan Hill, Santa Clara County, California by Earth Systems Pacific, dated April 23, 2012.

Dear Mr. Blackwell:

In accordance with your authorization of the above referenced proposal, this Geologic Hazards Evaluation and Soil Engineering Study has been prepared for use in the development of plans and specifications for your proposed 15-lot subdivision located on the southeast corner of Watsonville Road and Santa Teresa Boulevard. The recommendations contained herein should be considered preliminary and revised as necessary by Earth Systems Pacific once detailed plans for the project become available.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. Please do not hesitate to contact this office if there are any questions concerning this report.

Sincerely,

Earth Systems Pacific

Xyrus Mejia
Staff Engineer

Christopher M. Cecile
Project Geologist
Professional Geologist 8991

Bill E. Zehrbach
Senior Engineer
Geotechnical Engineer 926

REGISTERED PROFESSIONAL ENGINEER
BILL E. ZEHRBACH
GE 926
EXP. 9/30/13
GEOTECHNICAL
STATE OF CALIFORNIA
9/14/12

Distribution: Blackrock, LLC (4)
HMH Engineers (1)
David J Powers and Associates (1)
City of Morgan Hill, Attn: Rebecca Tolentino (1)

Doc. No.: 1209-191.SER

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Liquefaction Analysis

GEOLOGIC HAZARDS EVALUATION AND SOIL ENGINEERING STUDY

1.0 INTRODUCTION

1.1 Site Setting

The subject site is located at the intersection of Watsonville Road and Santa Teresa Boulevard in unincorporated Morgan Hill, California. The approximate center of the project is 37.0919°N latitude and 121.6457°E longitude on the United States Geological Survey's Mt. Madonna 7.5-Minute Quadrangle (Figure 1). The property is irregular in shape and bounded to the northwest by Watsonville Road, to the northeast by Santa Teresa Boulevard and residential development, to the southwest by residential development, and to the southeast by Llagas Creek.

The property is formerly home to a Christmas tree farm. As such, numerous evergreen trees of varying sizes and ages are found throughout the property. The majority of the Christmas trees are found on the northwest half of the property. Several other trees are found throughout the remainder of the site. Currently, a single family residence, detached garage, and a barn occupy the eastern portion of the site. In addition a recently imported stockpile of soil is found on the northern corner of the site. It is our understanding that this stockpile was imported with the intent of being used during grading operations. Generally, the site slopes gently from the northern portion of the property down to Llagas Creek located on the southern portion of the site.

1.2 Planned Development

We understand that the proposed development will consist of 15 single family detached residences and internal public streets. The residential structures will be one and two stories in height, of wood frame construction, with raised wood floors over a crawl space, on flat, graded building pads.

1.3 Scope of Services

Earth Systems Pacific (ESP) performed this Geologic Hazards Evaluation and Soil Engineering Study for Blackrock LLC for the subject site located at the intersection of Watsonville Road and Santa Teresa Boulevard in unincorporated Morgan Hill, California. The purpose of the Geologic Hazards Evaluation and Soil Engineering Study is to evaluate the

potential geologic and seismic conditions which may affect development of the site and to provide design-level geotechnical engineering recommendations for the proposed project.

The scope of work for the Geologic Hazards Evaluation is intended to satisfy the requirements of California Division of Mines and Geology (CDMG) Note 42: Guidelines to Geologic/Seismic Reports. Our scope included a review of published and unpublished geologic literature, review of geologic mapping and aerial photography of the site and vicinity, a general site reconnaissance, subsurface exploration, evaluation of the data collected, quantitative analysis of liquefaction potential at the site, and preparation of a written report section with supporting graphics.

The scope of work for the Soil Engineering Study included a review of published and unpublished geotechnical literature, a general site reconnaissance, subsurface exploration, laboratory testing of selected samples, an engineering evaluation of the data collected, and preparation of this written report. The analysis and subsequent recommendations were based on information provided by the client and the conceptual grading plans by HMH.

The report and recommendations are intended to comply with the considerations of the California Building Code (CBC), 2010 Edition, and common geologic and geotechnical engineering practice in this area at this time under similar conditions. The tests were performed in general conformance with the standards noted, as modified by common geotechnical practice in this area at this time under similar conditions.

Preliminary geotechnical recommendations for site preparation and grading; foundations; exterior flatwork; utility trenches; site drainage and finish improvements; and observation and testing are presented to guide the development of project plans and specifications. It is our intent that this report be used by the client to form the geotechnical basis of the design of the project as described herein, and in the preparation of plans and specifications.

Analysis of the soil for percolation rates, mold or other microbial content, radioisotopes, hydrocarbons, or other chemical properties are beyond the scope of this report. This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, shoring, temporary slope angles, and construction means and methods. Ancillary features such as swimming pools, temporary access roads, fences, light poles, and nonstructural fills are not within our scope and are also not addressed.

To verify that pertinent issues have been addressed and to aid in conformance with the intent of this report, it is requested that final grading and foundation plans be submitted to Earth Systems Pacific for review.

In the event that there are any changes in the nature, design, or locations of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained herein will not be considered valid unless the changes are reviewed and the conclusions of this report are verified or modified in writing by the geotechnical engineer and engineering geologist. The criteria presented in this report are considered preliminary until such time as they are verified or modified in writing by the geotechnical engineer in the field during construction.

2.0 GEOLOGIC REVIEW

2.1 Regional Geologic Setting

The subject site is located in the foothills of the Santa Cruz Mountains. The Mt. Hamilton-Mt. Diablo Range and the Santa Cruz Mountains, respectively, form the eastern and western boundaries of the Santa Clara Valley in the Coast Ranges geomorphic province in central California. These northwest-trending mountain ranges are the result of tectonic uplift that has been interpreted to have been occurring since Pliocene-Pleistocene time (beginning approximately 3 to 5 million years before present). The regional basins now occupied by San Pablo and San Francisco Bays, and the Santa Clara Valley, were formed by related tectonic processes during Pleistocene time.

The predominant structural feature in the California Coast Ranges is the San Andreas fault zone, which is the structural boundary between two tectonic plates: the Pacific Plate to the west of the San Andreas fault zone and the North American Plate east of the fault. These two plates are moving past each other at approximately 5.1 cm/year at the mouth of the Gulf of California and 1 to 3 cm/year in the central and northern parts of California (Brown, 1990). The Hayward and Calaveras faults, located on the east side of the Santa Clara Valley, are interpreted to be part of the San Andreas fault system.

For the San Francisco Bay area in general, the oldest rocks east of the San Andreas fault are the Jurassic-Cretaceous Franciscan Complex. The Franciscan Complex is composed of a chaotic assemblage of mainly shale, sandstone, chert, limestone, greenstone, and serpentinite. These rocks are interpreted to represent components of ancient Pacific Ocean crust that have

been disrupted and accreted to western California during Cretaceous to early Tertiary time and prior to development of the San Andreas fault system. The Franciscan Complex is overlain by, or in fault contact with, sedimentary rocks of upper Cretaceous age in some terranes in the southern and eastern Santa Clara Valley. West of the San Andreas fault, the oldest rocks are the predominantly Mesozoic granitic Salinian Block. Mesozoic and Paleozoic metamorphic rocks are a lesser component of the Salinian Block. On both sides of the San Andreas fault, the oldest rocks are overlain by Tertiary and Quaternary marine and terrestrial sedimentary rocks and local volcanic rocks. All of the above rock units were faulted, folded, and uplifted due to plate motions and activity on the San Andreas, Hayward, Calaveras, and smaller related faults. This deformation began about 30 million years ago but is mainly Pliocene to Pleistocene in age (~5 million to 11,700 years ago). Holocene-age (11,700 years to present-day) plate motion is expressed mainly as creep and seismicity on the various faults of the San Andreas fault system.

The Quaternary sediment in Santa Clara Valley was deposited when older rocks in the Santa Cruz Mountains and the Mt. Hamilton-Mt. Diablo Range were exposed to erosion by tectonic uplift.

2.2 Geologic Literature Review

2.2.1 Soil and Geologic Mapping

Two dominant soils are mapped at the site by the U.S. Department of Agriculture (Web Soil Survey, 2012). The northern half of the site is mapped as Pleasanton Loam (PoA) and the southern half is mapped as Zamora clay loam (ZbA). A thin strip of riverwash (less than 0.5% of the site area) is shown along the margin of Llagas Creek in the southernmost corner of the site.

PoA is described as a loam which occupies terraces and alluvial fans (0-2% slopes) and is derived from alluvium. It is described as well drained with a saturated hydraulic conductivity of 4.425 µm/s (0.64 inches/hr). The USDA describes PoA as a silty clay (CL-ML) with a published plasticity index of 13 and liquid limit of 35. Published data describes the soil as having a pH of 6.7 and an electroconductivity of 0.5 mmhos/cm.

ZbA is described as forming from alluvium derived from alluvial fans and is found on 0-2% slopes. It is described as a lean clay (CL) with a published plasticity index of 15 and liquid limit of 36. The USDA describes ZbA as well drained with a saturated hydraulic

conductivity of 2.7 µm/s (0.39 inches/hr). Published data describes the soil as having a pH of 7.0 and an electroconductivity of 0.6 mmhos/cm.

Dibblee (1973, 2005) mapped the geology of the Mount Madonna 7.5 Minute Quadrangle at a scale of 1:24,000. Dibblee shows the site as located in Quaternary alluvium (Qa). Franciscan rocks are shown in the nearby vicinity to the north and south. The nearest fault trace mapped by Dibblee is the Ben Lomond fault, located approximately 1.2 miles to the southwest, trending northwesterly across Hayes Valley. The fault is shown as concealed by Quaternary alluvium and is shown crossing through Franciscan rocks indicating Cretaceous through Tertiary as possible ages of faulting. Several other similar faults are shown to the southwest prior to reaching the Berrocal and Sargent faults 4.9 miles and 5.6 miles southwest, respectively. Both the Berrocal and Sargent faults offset Tertiary aged strata indicating at least Tertiary for possible age of faulting.

McLaughlin, et al. (2001) mapped the geology of the Mount Madonna Quadrangle at a scale of 1:24,000 (Figure 2). The map shows the site location as underlain by Plesitocene fan deposits on the north half of the site, and Holocene levee deposits on the southern half. Franciscan rocks are also shown in the general vicinity of the site. The overall geology indicates that the site is likely underlain by a Holocene and Pleistocene alluvium which overlies the Franciscan beneath the site. The Ben Lomond fault of Dibblee (2005) is shown as concealed by both Holocene and Pleistocene age alluvium; indicating that the fault in this area is older than Pleistocene. The Berrocal and Sargent faults are shown 4.9 and 5.6 miles to the southwest. These faults are both shown as concealed by Pleistocene deposits, again indicating Tertiary for possible age of faulting.

2.2.2 Faulting

Active faults are defined by the California Geological Survey (CGS) as faults that are well defined and have experienced movement within the last 11,700 years (Hart and Bryant, 2007). The definition of potentially active faults varies, however. A generally accepted definition of a potentially active fault is one that shows evidence of displacement older than 11,700 years and younger than 1,600,000 years (i.e., Pleistocene in age). However, potentially active is no longer used as criteria for zoning by the state. The terms sufficiently active and well-defined are now used by the CGS as criteria for zoning faults under the Alquist-Priolo Act (Hart and Bryant, 2007). Inactive faults are classified as not having been active within the last 1.8 million years.

The site is located within the seismically active Coyote Valley area, but outside current State Earthquake Fault Zones (CGS, 1976) and County Fault Rupture Hazard Zone (County of Santa Clara, 2002). The nearest State-zoned fault is the San Andreas fault. The nearest County zoned fault is the Sargent-Berrocal fault zone approximately 6 miles southwest of the subject site.

The major active faults in the southern Santa Clara County Area are the San Andreas and Calaveras faults. The San Andreas fault is approximately 7.9 miles southwest of the site and the Calaveras faults is located approximately 5.3 miles northeast of the site (WGCEP, 2008).

The nearest mapped fault to the site, irrespective of zoning, is the Ben Lomond fault mapped by Dibblee (2005) approximately 1.2 miles to the southwest of the proposed project site, trending northwesterly. Other nearby faults include the Berrocal (Pleistocene-active; Jennings, 2010), and Sargent fault (Holocene-active; Jennings, 2010).

2.2.3 Landsliding

No State of California Seismic Hazard Zone map currently exists for the Mount Madonna Quadrangle. The County of Santa Clara (2002a; Figure 3). Shows a landslide hazard zone extending approximately 100 feet into the southernmost portion of the site. No slides have been mapped on or around the subject site by others.

2.2.4 Liquefaction

No State of California Seismic Hazard Zone map currently exists for the Mount Madonna Quadrangle. The site is located in a liquefaction hazard zone defined by the County of Santa Clara (2002b) (Figure 4).

2.2.5 Earthquake History

Several strong earthquakes have occurred on the active faults in the San Francisco Bay region within the last 200 years (Figures 5 and 6). Especially notable are the 6.8M 1868 Hayward earthquake, the 1906 8.3M San Francisco earthquake, the 1926 Monterey Bay 6.1M doublet, the August 6, 1979, 5.8M Coyote Lake earthquake, the April 24, 1984, 6.2M Morgan Hill (Halls Valley) earthquake, and the October 17, 1989, 7.1M (6.9Mw) Loma Prieta earthquake. The Calaveras fault is considered active from San Ramon to Hollister (Hart, 1984), and three earthquakes of Richter magnitude 5.8 and larger have occurred on the Calaveras fault since 1900 (Stover, 1984).

The epicenters of the 1984 Morgan Hill (Mw 6.1) and 1989 Loma Prieta (Mw 6.9) earthquakes were, respectively, approximately 16.4 miles north and 13.1 miles southwest of the subject site. The 1984 Morgan Hill earthquake produced ground shaking equivalent to a modified Mercalli intensity of VIII and the 1989 Loma Prieta earthquake also produced ground shaking equivalent to a modified Mercalli intensity of VII in the 95037 zip code of Morgan Hill (USGS, 2012). Figure 7 is a reproduction of the Modified Mercalli Intensity Scale (ABAG, 2003). It should be expected that the subject site will be affected by future earthquakes of comparable or greater magnitude than the 1984 Morgan Hill and 1989 Loma Prieta earthquakes.

Whereas the U.S. Geological Survey no longer attempts to predict the occurrence and magnitude of future earthquakes, the Working Group on California Earthquake Probabilities (2008) has estimated that there is a 63% probability that one or more major earthquakes (M_W 6.7+) will occur in the Bay Area by the year 2037 (Figure 8). The Hayward fault is considered the most likely fault in the Bay Area (31% probability) followed by the San Andreas fault (21%) and the Calaveras fault (7%) to have a major earthquake by the year 2037.

2.3 Aerial Photo Interpretations

Earth Systems Pacific reviewed aerial photographs of the site and vicinity from 1956 through 1988, for the presence of terrain features indicative of landslides or active fault zones. The subject site is visible on the photographs we reviewed.

A lineament is seen in stereo aerial photographs as a feature having tonal differences on either side. These differences may be due to changes in soil or rock type, vegetation, groundwater levels, geologic structure, or sedimentary bedding characteristics. Lineaments are sometimes associated with topographic features characteristic of faults, such as linear and shutter ridges, sag ponds, spring zones, and offset drainages. No photo lineaments were observed to cross the proposed project site. The nearest lineaments observed were associated with the Coyote Creek fault (4.2 miles northeast) and the Calaveras fault (5.3 miles northeast).

The aerial photographs were also examined for geomorphic features characteristic of ancient (dormant) and active landslides. No evidence of landsliding was observed on or adjacent to the site. Several small scale slides and colluvial swales were observed to the west of the site, but these do not discharge on or near the site.

3.0 FIELD INVESTIGATION AND LABORATORY TESTING

3.1 Subsurface Exploration

The subsurface exploration consisted of seven exploratory borings drilled at the site on May 21, 2012. The exploratory borings were drilled under the direction of an ESP staff engineer at the approximate locations shown on the Site Map (Figure 9). The borings were drilled to depths of 15 to 32 feet below the ground surface. The borings were drilled using a truck-mounted B-53 drill rig equipped with an 8-inch diameter, continuous-flight hollow-stem auger. Soil materials encountered in the borings were categorized and logged in general accordance with the Unified Soil Classification System. Copies of the boring logs are included in Appendix A.

3.2 Subsurface Profile

Our borings at the site generally encountered 4 to 12 feet of brown to dark brown, very stiff to hard, sandy lean clay (CL) overlying granular soil layers. Generally, the thicker clay layers wrap the northwest, northeast, and southeast edges of the property. Two borings located towards the center of the property, Borings B3 and B6, had thinner clay surficial layers on the order of 4 to 4.5 feet. Below the clay, we encountered medium dense to dense, clayey sands (SC) and gravel-sand-clay mixtures (GC) to the bottom of the depths explored with the exception of Borings B1 and B7. Borings B1 and B7 (closest to Llagas Creek), drilled to depths of 25 and 31 feet, encountered shale at the bottom of the explored depths. At the shale contact, drilling and sampling refusal was encountered.

Groundwater was encountered between 8 and 12 feet below the ground surface. Publicly available data from the State Water Resources Control Board's GeoTracker (2012) database indicates that the site was historically home to two underground storage tanks which were removed in 1976 and 2000. The site was closed in 2000. Santa Clara Valley Water District documents indicate that groundwater monitoring was performed and that the highest groundwater depth was 12.51 feet below the ground surface. It should be noted, however, that fluctuations in the level of subsurface water can occur due to variations in rainfall, temperature, and other factors, and groundwater levels should not be considered constant.

3.3 Laboratory Testing

As the borings were drilled, soil samples were obtained using a tube-lined barrel sampler (ASTM D 3550-01 (2007) with shoe similar to D 2937-04). Standard penetration tests were

also performed at selected intervals (ASTM D 1586-08a). Selected tube samples were tested for moisture content and dry density (ASTM D 2216-05 and D 2937-04), two samples were tested for shear strength (ASTM D 3080-04), one sample was tested for a plasticity index (ASTM D 4318-10), and five samples were tested for grain size characteristics (ASTM D 1140-06). One bulk sample was tested for an R-Value (ASTM D 2844-07). Copies of the laboratory test results are included in Appendix B.

4.0 DATA ANALYSIS

4.1 Subsurface Soil Classification

Based on the boring data, the site is assigned to Site Class D (stiff soil) as defined by Table 1613.5.2 of the 2010 CBC.

4.2 Seismic Design Parameters

The seismic parameters presented in Table 1 comply with Chapter 16 of the California Building Code (2010 Edition). The values were determined utilizing the USGS Earthquake Hazards Program Earthquake Ground Motion Parameter Java Application and the International Building Code provisions.

TABLE 1

Summary of Seismic Parameters - CBC 2010
(Site Coordinates 37.0919°N, 121.6457°W)

Site Class	D	
Short Term Spectral Response Parameter - S_s	1.500g	
1 Second Spectral Response Parameter - S_1	0.605g	
Site Coefficient – F_a	1.0	($S_s \geq 1.25$)
Site Coefficient - F_v	1.5	($S_1 \geq 0.5$)

4.3 Deterministic Seismic Hazard Evaluation

Estimated peak horizontal ground acceleration is one of the basic parameters used to characterize the ground shaking potential at a given site. Actual ground accelerations at a locality are influenced by topography, geologic structure, condition of subsurface materials, and groundwater level. Table 2 lists the estimated seismic parameters for known active faults in the San Francisco Bay region that could produce earthquakes that would impact the site.

The estimated mean peak horizontal ground accelerations presented in Table 2 are based upon the mean, 5% damped, peak ground acceleration derived from three Next Generation Attenuation (NGA) relationships. The NGA relationships used were Campbell & Bozorgnia (2008), Boore & Atkinson (2008), and Chiou & Young (2006). The fault parameters used in our analysis were obtained from the WGCEP Uniform California Earthquake Rupture Forecast (UCERF1; 2002), and UCERF2 (2008) with estimated Type B source recurrence intervals from the California Geological Survey (CGS) Open File Report 96-08 (1996). For historically considered faults (no longer considered as independent seismic sources), such as the Sargent fault, fault parameters were obtained from Cao et al (2003). For our analysis we used an estimated Vs_{30} = 365 m/s, based on the site geology and the soil classification (Site Class D) determined in accordance with Table 1613.5.2 of the 2010 California Building Code.

This method of seismic analysis is a deterministic approach in that the maximum considered earthquake (MCE) along each active fault within the region that may be reasonably expected to generate strong ground shaking at the site is evaluated. Table 2 also lists the distance of the causative faults from the site as derived from the computer program EQFAULT (Blake, 2004), and supplemented by data obtained from published geologic maps, the possible earthquake magnitudes that may be generated by the faults, the recurrence interval for the faults, and the seismic source type classification of WGCEP UCERF2 (2008).

Based on the data presented in Table 2, below, it appears that the highest peak ground acceleration will result from an earthquake occurring on the San Andreas fault. The highest short period ground acceleration would result from an earthquake occurring on the Calaveras fault. The highest 1-second ground acceleration would result from an earthquake on the San Andreas fault. We have included the Sargent fault and the southeast extension of the Hayward fault in our search due to their historical zoning status. The values given are conservative in that it is assumed that the earthquake will occur at the near-point of a fault relative to the site.

TABLE 2
Deterministic Estimates of Ground Acceleration for Significant Known Faults in the Site Region ("Stiff Soil" Site[2])

Fault	Closest Distance (mi/km)	Maximum Magnitude (Mw)[1]	Estimated Ground Acceleration (g) Mean[2] PGA	T_s	T_1	Recurrence Interval[3] (years)	Source Type[4]
Calaveras	5.3/8.5	7.0	0.302	**0.649**	0.386	54	A
Sargent*	5.6/9.0	6.8	0.284	0.622	0.343	1200	B
San Andreas	8.6/13.8	8.05	**0.314**	0.622	**0.462**	229	A
Zayante-Vergeles	11.8/19.1	7.0	0.199	0.437	0.225	8821	B
Hayward (SE Extension)*	13.2/21.1	6.4	0.136	0.328	0.132	220	B
Monte Vista-Shannon	13.3/21.5	6.5	0.142	0.341	0.143	2410	B
Quien Sabe	19.3/31.1	6.6	0.121	0.277	0.118	647	B

[1] Moment magnitude from WGCEP UCERF2 (2008) or Cao et al (2003)
[2] Ground Accelerations estimated from mean of NGA relationships using Vs30=540m/s (assumed) (2010 CBC Site Class C Soil)
[3] Recurrence intervals from WGCEP UCERF2 (2008) or CDMG OFR 96-08.
[4] Seismic source type from WGCEP UCERF2 (2008).
*Not included in 2002 CGS Data, (Cao et al, 2003) or 2008 WGCEP data.

4.3 Quantitative Liquefaction Analysis

Soil liquefaction is a phenomenon where saturated granular soils undergo a substantial loss of strength due to increased pore water pressure resulting from cyclic stress applications induced by earthquakes or other vibrations. In this process, the soil acquires mobility sufficient to permit both vertical and horizontal movements, which may result in significant deformations. Soils most susceptible to liquefaction are loose, uniformly graded, fine-grained sands. In addition, recent literature indicates that fine grained soils may also be susceptible to liquefaction or cyclic strain softening. Examples of highly susceptible fine-grained soil include "nonplastic silts and clayey silts of low plasticity (PI<12) at high water content to liquid limit ratios (w_c/LL>0.85)." Examples of soils moderately susceptible to liquefaction include "clayey silts and silty clays of moderate plasticity (12<PI<18) at w_c/LL>0.80" (Bray and Sancio, 2006). It is generally acknowledged that liquefaction will not occur if these deposits are located at a depth greater than 50 feet below the ground surface. In the deeper deposits, the greater overburden pressure is sufficient to prevent liquefaction from occurring.

The liquefaction potential at the subject site was evaluated using the methodology suggested in the 1996 and 1998 National Center for Earthquake Engineering Research workshops (NCEER) on evaluation of liquefaction resistance of soils (Youd & Idriss, editors), and the 1999 Southern California Earthquake Center (SCEC) "Recommended Procedures for Implementation of DMG

Special Publication 117". A brief outline about the variables involved in the liquefaction evaluation process is described below.

One of the steps of liquefaction potential evaluation consists of normalizing the SPT blow count to the effective overburden stress of 100 kilopascal (or 1.044 tons per square foot). This is denoted as $N_{1(60)}$ and is found through the following formula:

$$N_{1(60)} = N_m C_N C_E C_B C_R C_S$$

where:

N_m = measured standard penetration resistance
C_N = factor to normalize N_m to a common reference effective over-burden stress
C_E = hammer energy ratio (ER) correction factor
C_B = borehole diameter correction factor
C_R = rod length correction factor
C_S =correction factor for samplers with or without liners

Factor	Variable	Term	Correction
Overburden Pressure		C_N	$(P_a/\sigma'_{vo})^{0.5}$; $0.4<C_N<2$
Energy Ratio	Safety Hammer Donut Hammer Automatic Trip Hammer	C_E	0.60 to 1.17 0.45 to 1.00 0.9 to 1.6
Borehole Diameter	65 mm to 115 mm 150 mm 200mm	C_B	1.0 1.05 1.15
Rod Length	3m to 4m 4m to 6m 6m to 10m 10m to 30m >30 m	C_R	0.75 0.85 0.95 1.0 <1.0
Sampling Method	Standard Sampler Sampler without liners	C_S	1.0 1.2

The other steps involve obtaining two variables: the seismic demand on a soil layer, expressed in terms of CSR (cyclic stress ratio), and the capacity of a soil layer to resist liquefaction, expressed in terms of CRR (cyclic resistance ratio).

CSR can be calculated using the following equation:

$$CSR = (\tau_{av}/\sigma'_{vo}) = 0.65(a_{max}/g)(\sigma_{vo}/\sigma'_{vo})r_d$$

where:
a_{max} = peak horizontal acceleration at the ground surface generated by the earthquake
g = acceleration of gravity
σ_{vo} = total vertical overburden stress
σ'_{vo} = effective vertical overburden stress
r_d = stress reduction coefficient

CRR can be obtained from the Simplified Base Curve graphical representation recommended for determination of CRR from SPT for Magnitude 7.5 along with Empirical Liquefaction Data (after Youd and Idriss 1977). A factor of safety (FS) against liquefaction is then calculated using the following equation:

$$FS = (CRR_{7.5}/CSR)\ MSF$$

where $CRR_{7.5}$ is the cyclic resistance ratio for a magnitude 7.5 earthquake and MSF is the magnitude scaling factor. The soil layer is considered to be potentially liquefiable if the CRR and CSR established for the soil stratum at a given depth produce a factor of safety against liquefaction, CRR/CSR, less than the selected factor of safety for the project. A general guideline in selecting an appropriate factor of safety for a project is shown in the table below (SCEC, 1999):

Consequence of Liquefaction	$(N_1)_{60}$ (clean sand)	Factor of Safety
Settlement	≤15 ≥30	1.1 1.0
Surface Manifestation	≤15 ≥30	1.2 1.0
Lateral Spreading	≤15 ≥30	1.3 1.0

The variables discussed in the above text are used to develop a profile of the soil, and an in-house developed computer spreadsheet analysis is carried out to assess liquefaction triggering, liquefaction settlement, and seismically induced settlement.

4.3.1 Analysis

For the analysis, a high groundwater elevation of 8 feet was modeled (highest encountered groundwater during exploration work). The peak ground acceleration (pga) used in the analysis was taken as 0.57g, the highest pga taken from the three sources listed below.

Peak Ground Acceleration	Source
0.31g	Deterministic Estimates of Ground Acceleration (this study)
0.40g	SDs/2.5, Paragraph 1802.2.7 of the California Building Code (2010 Edition)
0.57g	2002 California Probabilistic Seismic Hazard Assessment (PSHA) Model developed jointly by the CGS and USGS

In general, the fine grained clay soils found at the site in the upper 4 to 12 feet are stiff to very stiff and in our opinion are not susceptible to liquefaction. The coarse grained soils found below the clay soils vary in consistency throughout the site. Generally, the dense nature of these coarse grained materials resulted in higher factors of safety against liquefaction occurrence. However, in two borings (B3 and B4) loose to medium dense granular soils were encountered that are susceptible to liquefaction or dry sand subsidence. A summary of our liquefaction analysis is presented below.

Liquefaction Analysis (Groundwater – 8 feet)

Boring Number	Dry Sand Subsidence (inches)	Liquefaction Settlement (inches)	Total Liquefied Thickness (feet)
B1	0	0	0
B2	0	0	0
B3	0.2	0.5	4
B4	0	0.5	4
B5	0	0	0
B6	0	0	0
B7	0	0	0

4.3.2 Discussion

The loose to medium dense coarse soils found in Borings B3 and B4 that are susceptible to liquefaction are classified as poorly graded sand to clayey gravels. The analysis on these layers indicates that approximately ½ inch of liquefaction related settlement may occur. These saturated, loose to medium dense layers are not found uniformly throughout the site and are

located away from Llagas Creek, and therefore liquefaction settlement is not anticipated to occur throughout the entire site, but in localized areas.

In addition, the liquefaction analysis presented above was run using a high groundwater of 8 feet, which was encountered in only one boring (B3). If we ran the analysis using the 12 foot water table (shown in table below) as found in the remaining borings as well as in the Santa Clara Valley Water District documents, liquefaction susceptibility of the site is considered low.

Liquefaction Analysis (Groundwater – 12 feet)

Boring Number	Dry Sand Subsidence (inches)	Liquefaction Settlement (inches)	Total Liquefied Thickness (feet)
B3	0.2	0	0
B4	0.1	0	0

Surface Manifestation

Under the analysis modeling groundwater at 8 feet, surface manifestation (sand boils and ground cracking) as a result of a liquefaction event is possible and may lead to loss of bearing capacity. The possibility of surface manifestation would be considered low under the analysis modeling groundwater at 12 feet.

Lateral Spreading

The borings most critical to liquefaction analysis (B1 and B7) were located towards Llagas Creek, and our liquefaction analysis indicated low susceptibility due to the dense nature of the coarse grained soils and shale encountered at the bottom of the borings. Since the liquefiable sediments found on the site in Borings B3 and B4 are not uniform throughout the site and located away from Llagas Creek, lateral spreading is considered low.

5.0 GEOLOGIC ANALYSIS AND CONCLUSIONS

This Geologic Hazards Evaluation was conducted to determine the geologic conditions at the subject site and to evaluate potential geologic hazards that may impact the proposed development. Our Geologic Hazards Evaluation focused on addressing potential geologic hazards associated with slope stability. In general, the potential geologic hazards encountered in the San Francisco Bay Area include landslides, debris flows, and the hazards concomitant with earthquakes. Earthquake-related hazards include ground rupture along the trace of a

fault, ground shaking, ridge-top cracking, lateral spreading, lurching, liquefaction, and earthquake-induced landsliding.

The following conclusions are based on the data acquired and analyzed during the course of ESP's Geologic Hazards Evaluation. The site geology is shown on Figure 9.

5.1 Primary Seismic Hazards

5.11 Ground Rupture

The proposed building sites are not within an earthquake fault zone as defined by the current published State fault rupture maps that we reviewed. There are no mapped active fault traces that cross, or trend towards, the building site. It is ESP's opinion that the potential for surface rupture at the site is low.

5.2.2 Ridge-top Cracking

The effects of topography on relative ground shaking intensity and resultant ground surface disturbance and structural damage were noted in the Santa Cruz Mountains after the 1906 San Francisco Earthquake (Lawson, 1908) and the 1989 Loma Prieta earthquake (Plafker and Galloway, 1989). Ridge-top cracking during the 1989 Loma Prieta earthquake damaged roadways and structures approximately 10 km from the epicenter in the Summit Road area of the Santa Cruz Mountains. The origin of the cracks is complex, and may have been caused in part by large-scale lateral spreading in the relatively soft Tertiary sedimentary rocks that form the northwest-trending ridges in the region (Plafker and Galloway, 1989). The topographic effects of ground shaking and high level of ground cracking and structural damage after the Loma Prieta earthquake have been studied at Robinwood Ridge, approximately 7.5 km north-northwest of the epicenter (Hartzell et al., 1994). The study by Hartzell et al. concluded that the apparent amplification of ground shaking is a complex interaction of seismic and topographic conditions that cannot be quantified with existing data. The site is not located in terrain comparable to that affected by the 1989 Loma Prieta earthquake. The potential for ridge-top cracking is deemed to be low at the site.

5.2.3 Ground Shaking

The main identified geologic hazard at this site is the potential for strong seismic ground shaking. A moderate to major earthquake on the San Andreas, Calaveras, or any of the other nearby active faults could cause severe ground shaking at the site. The foundations for the

proposed residences should be designed for seismic shaking, including horizontal and vertical accelerations, as required by the latest edition of the California Building Code. These values should be considered minimum design criteria.

5.2 Secondary Earthquake Effects

5.2.1 Landslides

The geologic maps and aerial photographs examined for this Geologic Hazards Evaluation do not show the site to be located near any existing landslides. Only the southernmost portion of the property is within a Santa Clara County landslide hazard zone. The subject site is located in relatively flat terrain and no features indicative of landsliding were observed on the site during our site visit. It is ESP's opinion that the hazard posed by landsliding is low.

5.2.2 Liquefaction

Our analyses indicate that there is a potential for liquefaction resulting from ground shaking during conditions of high groundwater. Total settlements would be on the order of 0.5 inches or less. However, there is a potential for some surface manifestation in portions of the site.

5.3 Other Geologic Concerns

5.3.1 Debris Flows

Debris flows are a type of landslide characterized by a rapidly flowing mass of rock fragments, soil, and mud with more then half of the particles being larger than sand size and typically containing cobbles and boulders as well. Debris flows generally are initiated in colluvium filled hollows. These flows result almost invariably from unusually heavy rain, and tend to find their way into drainages and travel for significant distances. For example, a catastrophic rainstorm in the San Francisco Bay area in January 1982 deposited nearly half the normal annual rainfall in 32 hours and triggered more than 18,000 landslides, principally debris flows, and caused 25 fatalities and $66 million in property damage (NOAA, 2005). Due to the site's location away from natural drainages and thick colluvial filled hollows, the potential for debris flows to affect the proposed building sites is considered low.

5.3.2 Flooding

According to Flood Insurance Rate Map, Panel Number 06085C 0609H, dated May 18, 2009, published by the Federal Emergency Management Agency (FEMA), the site is located in areas of Zone X, Zone D, and Zone AE (Figure 10). Zone X is described as *areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood.* Zone D is described as *areas where flood risk is undetermined, but possible.* Zone AE is described as *Floodway – channel of stream and adjacent floodplain areas that must be kept free of encroachment.*

Zone AE appears to clip the rear of Lots 14 and 15. No structures may be constructed within this zone.

6.0 SUMMARIZED GEOLOGIC CONCLUSIONS AND RECOMMENDATIONS

The proposed subdivision at the subject site is considered feasible from a geologic viewpoint provided the recommendations contained herein are implemented in the design and construction of the development. The property owner should be aware that development in the seismically active Bay Area entails variable risks, which may include potential structural distress to residences and on-site pavements, plus disruption of local roads and utilities.

The main identified geologic hazards at the site is the potential for strong seismic shaking due to an earthquake on one or more of the more active faults in the San Francisco Bay Area and the potential for localized liquefaction of the near surface soils. A moderate to major earthquake on the San Andreas, Calaveras or other nearby faults could cause severe ground shaking at the site. The foundations for the proposed structures and anticipated improvements should be designed to accommodate seismic shaking and the effects of liquefaction.

No evidence of large scale active or dormant landsliding which might affect the proposed development was noted during our review of aerial photographs or site reconnaissance. No landslides have been mapped by others on or near the site. It is our opinion that the hazard posed by landsliding at the site is low.

The site is underlain by alluvial sediment to between 22 and 31 feet below the ground surface. Beneath this, drilling refusal was encountered in hard dark gray shale. Under the highest water conditions, the site would be susceptible to liquefaction and surface manifestation. In our

opinion, the most detrimental effect liquefaction would have on the site would be the possibility of bearing capacity loss during a seismic event.

The geotechnical engineering conclusions and recommendations presented in the Sections 7.0 and 8.0 of this report should be implemented during the design and construction of the proposed subdivision.

7.0 SOIL ENGINEERING CONCLUSIONS

7.1 Site Suitability

Based on our analysis of the results of the field investigation and laboratory testing program, it is our opinion that the site is geotechnically suitable for the proposed residential subdivision, provided the recommendations contained herein are implemented in the design and construction. The primary geotechnical concerns at the site are the expansion potential of the surficial soils and the potential for liquefaction related ground deformation.

7.2 Soil Expansion Potential

The surficial soils have a Plasticity Index (PI) of 27 indicating a moderately high expansion potential. In general, expansive soils tend to swell with increases in soil moisture and shrink as the soil moisture decreases. The volume changes that the soils undergo in this cyclical pattern can stress foundations, slabs, and exterior flatwork if precautionary measures are not incorporated into the construction procedure. Due to the expansive nature of the surficial soil, deepening footings and presoaking foundation excavations may be deemed necessary.

7.3 Liquefaction Mitigation

Based on our analysis there is a potential for localized liquefaction at the site that could affect improvements, depending upon the depth to groundwater. Three possible measures were considered to mitigate the effects of liquefaction on the building foundations. One measure would be to utilize an integrated foundation system with through-going strip footings and tie beams with no isolated foundation elements. The second measure would be to over-excavate the building pad approximately 4 feet below the bottom of the foundations, place a filter fabric across the bottom of the excavation and backfill the excavation to design pad grade. The third measure would be to utilize concrete mat or PT foundation slabs. The report provides recommendations for the first option, the unitized foundation system. Recommendations for the other two options can be provided upon request.

7.4 Site Preparation and Grading

According to the *Conceptual Grading Plan*, the lots have pad elevations on the order of 340.5 to 343. In order to reach these pad grades, fill on the order of 2 to 4 feet is anticipated throughout the site, with the deeper fills towards the northern portion of the site. Prior to fill and grading work, a significant amount of site preparation will need to take place. This would entail stripping the site of vegetation, removal of trees and their root systems, and the razing of existing structures. To account for possible ground disturbance from these activities, sub-excavation on the order of 1 to 2 feet in building pad areas is required.

7.5 Foundations

The proposed Quail Vineyard residences may be supported by conventional strip footings constructed on a graded building pad. To mitigate the effects of potential liquefaction, the foundation system should be integrated, with through going strip footings or tie beams and no isolated footings. Concrete post-tensioned foundations are another alternative.

7.6 Static Settlement

The foundation loads are anticipated to be typical for conventional wood frame buildings. Static settlements are not anticipated to exceed 1 inch with differential settlement of less than ½ inch between adjacent foundation elements.

7.7 Existing Stockpile

It is our understanding that the on-site stockpile is from a previous jobsite located at 1115 Newhall Drive in San Jose, California. According to the US Department of Agriculture, Soil Conservation Service, the surficial soils at the borrow site are silty clays of the Sunnyvale series. These soils are characterized as having a Plasticity Index in the range of 20 to 30, indicating an expansion potential similar to that of the on-site native soils. Cornerstone Earth Group prepared a letter report titled "Supplemental Geotechnical Recommendations" for the development at the borrow site. They indicated that near surface soils at the borrow site are a mixture of import soils from a site in Palo Alto with PI's ranging from about 18 to 37. The estimated that the average PI is about 25 based on their laboratory testing. The Geotechnical Engineer should review the stockpile prior for use as fill on the site.

8.0 SOIL ENGINEERING RECOMMENDATIONS

8.1 Site Preparation and Grading

General Site Preparation

8.1.1 Site clearing, placement of fill, and grading operations at the site should be conducted in accordance with the recommendations provided in this report. Compaction recommendations for site grading work can be found later in this section.

8.1.2 Existing utilities, where known, should be located on the grading plans, to assist the Geotechnical Engineer during grading operations. Existing utility lines that will not be serving the proposed subdivision should be either removed or properly abandoned. The necessity of removing abandoned underground utility lines should be determined by the Geotechnical Engineer during site grading.

8.1.3 Surface vegetation (weeds, shrubs, etc.), and organically contaminated topsoil must be removed from areas to be graded. The depth of surface organic stripping will probably vary and should be determined by the Geotechnical Engineer during grading operations. Organically contaminated soils may either be stockpiled and later used as topsoil in landscaping areas or removed from the site.

8.1.4 Trees that are to be removed from the site should have their main root systems removed. In addition, tree roots larger than 1 inch in diameter should be chased out and removed. The depressions from the removal of the tree root systems should be reviewed by the Geotechnical Engineer to determine the need of additional excavation work. Once approved, the bottom of the depression should be scarified and cross-scarified 8 inches in depth, moisture conditioned, and recompacted. The depressions should then be backfilled with approved, compacted, moisture conditioned structural fill, as recommended in other sections of this report.

8.1.5 It is likely that tree removal and demolition of the existing residences and associated buildings will disturb the ground. Therefore we recommend that the upper 12 to 24 inches of existing ground in the proposed building areas be sub-excavated and the excavation reviewed by the Geotechnical Engineer. The lateral extent of the sub-excavation should extend at least 5 feet beyond the proposed building footprint and appurtenant concrete flatwork. If disturbed soil, remnants of foundations, large tree roots, or debris are encountered after the removal of the upper 24 inches, additional

sub-excavation should be performed until identified undocumented fill, loose disturbed soil, or debris is removed from the building footprint. Once clean undisturbed soil is encountered, the bottom of the excavation should be scarified and cross-scarified 8 inches in depth, moisture conditioned, and recompacted. The depressions should then be backfilled with approved, compacted, moisture conditioned structural fill, as recommended in other sections of this report.

8.1.6 Over-excavated material can be re-used as fill provided it is cleared of excessive quantities of organics or other potentially deleterious materials. Tree roots larger than one inch in diameter should be removed from the fill material. The fill should be placed in moisture conditioned lifts not exceeding 8 inches in non-compacted thickness.

8.1.7 The Geotechnical Engineer should be notified at least 48 hours prior to commencement of grading operations.

Compaction Recommendations

8.1.8 In general, prior to placement of fill on the site, the surface soils should be scarified at least 8 inches, moisture conditioned and recompacted to the recommended relative compaction present below, unless noted otherwise. This scarification operation should be performed at locations designated for proposed structural fill, concrete slabs-on-grade, foundations and asphalt pavement areas.

8.1.9 Recompacted native soils and structural fill should be compacted to a minimum relative compaction of 90 percent of maximum dry density at a moisture content above optimum. Pavement subgrade should be compacted to a minimum 92 percent of maximum dry density at a moisture content above optimum. Aggregate base should be compacted to at least 95 percent of maximum density.

8.1.10 Due to the fine-grained nature of the upper soils, and depending on moisture conditions at the time of construction, there is a potential for the soils to become unstable during grading. Unstable soils hinder compactive effort and are inappropriate for placement of additional fill. Alternatives to correct instability include aeration to dry the soils, lime treatment, over-excavation and recompaction, and the use of gravel or geotextiles as stabilizing measures. Recommendations for stabilization should be provided by a representative of Earth Systems Pacific, as needed, during construction.

8.2 Foundations

8.2.1 The proposed residential structures may be supported by either conventional strip foundations or concrete post-tensioned foundations. Recommendations for both systems are provided below.

Conventional Foundation Systems

8.2.2 To mitigate the potential effects of liquefaction, it is recommended that the foundation system consist of through going strip footings and tie beams. Isolated spread footings are not recommended.

8.2.3 The foundations should extend a minimum of 24 inches below the lowest adjacent soil pad grade. Foundations should be designed using a maximum allowable bearing capacity of 2,500 psf dead plus live load. This value may be increased by one-third when transient wind loads are included. No increase is allowed for seismic loading conditions.

8.2.4 Minimum widths of continuous footings should be 12 inches

8.2.5 Resistance to lateral loads should be calculated based on a passive equivalent fluid pressure of 300 pcf and a friction factor of 0.3. Passive and frictional resistance can be combined in the calculations without reduction to either value. These values are based on the assumption that backfill adjacent to foundations is properly compacted. The upper 12 inches of embedment should be neglected where landscape soil abuts the foundation.

8.2.6 The foundation excavations should be moisture conditioned to over optimum to close any desiccation cracks prior to the placement of concrete, as recommended by the Geotechnical Engineer in the field. The Geotechnical Engineer should observe the foundation excavations prior to forming or placement of reinforcing steel to verify the adequacy of the conditioning or recommend additional moisture conditioning, if deemed necessary.

8.2.7 Foundation excavations should be free of excessive slough prior to placement of concrete and reinforcing steel. The footings should be reinforced as directed by the

architect/engineer. For the expansive soil condition, we recommend at least one #5 bar, top and bottom.

Concrete Post-tensioned Slab-On-Grade Foundations

8.2.8 The post-tensioned slab should be designed in accordance with the provisions of the current edition of the California Building Code and the recommendations of the Post-Tensioning Institute. Geotechnical design parameters presented below were calculated in accordance with the third edition of "Design of Post-Tensioned Slabs-on-Ground" by the Post-Tensioning Institute.

Edge Moisture Variation Distance (e_m)	
Center Lift Condition	9.0 feet
Edge Lift Condition	4.6 feet
Estimated Differential Swell (y_m)	
Center Lift Condition	1.0 inches
Edge Lift Condition	1.5 inches
Allowable Bearing Capacity (dead load)	1,000 psf
Allowable Bearing Capacity (dead + live loads)	1,500 psf
Allowable Bearing Capacity (DL+LL+ wind or seismic)	2,000 psf
Subgrade Friction Factor (slab against subgrade)	0.25
Total settlement (static)	1 inch
Differential settlement (static)	0.5 inches

8.2.9 The building pad should be periodically moisture conditioned as necessary to maintain the soil moisture content at a minimum of 2 percentage points above optimum until the placement of concrete or vapor retarding membranes. The moisture content of the soil should be tested by the Geotechnical Engineer prior to placement of the concrete or vapor retarding membranes.

8.2.10 In areas where moisture transmitted from the subgrade would be undesirable, a vapor retarder should be utilized beneath the floor slab. The vapor retarder should comply with ASTM Standard Specification E 1745-11 and the latest recommendations of ACI Committee 302. The vapor retarder should be installed in accordance with ASTM Standard Practice E 1643-11. Care should be taken to properly lap and seal the vapor retarder, particularly around utilities, and to protect it from damage during construction.

8.2.11 If sand, gravel or other permeable material is to be placed over the vapor retarder, the material over the vapor retarder should be only lightly moistened and not saturated

prior to casting the slab. Excess water above the vapor retarder would increase the potential for moisture damage to floor coverings. Recent studies, including those by ACI Committee 302, have concluded that excess water above the vapor retarder would increase the potential for moisture damage to floor coverings and could increase the potential for mold growth or other microbial contamination. These studies also concluded that it is preferable to eliminate the sand layer and place the slab in direct contact with the vapor retarder, particularly during wet weather construction. However, placing the concrete directly on the vapor retarder would require special attention to using the proper vapor retarder, concrete mix design, and finishing and curing techniques. In this case, the vapor retarder should be underlain by at least 2 inches of clean washed pea gravel or crushed gravel.

8.2.12 When concrete slabs are in direct contact with vapor retarders, the concrete water to cement (w/c) ratio must be correctly specified to control bleed water and plastic shrinkage and cracking. The concrete w/c ratio for this type of application is typically in the range of 0.45 to 0.50. The concrete should be properly cured to reduce slab curling and plastic shrinkage cracking. Concrete materials, placement, and curing methods should be specified by the architect/engineer.

8.2.13 To further protect moisture-sensitive floor coverings, the perimeters of the post-tensioned slabs should be deepened to penetrate a minimum of 4 inches into the subgrade soil. Also, the concrete could be proportioned to reduce its porosity (and its corresponding potential for transmitting moisture) by limiting the w/c ratio to 0.48 or less.

8.2.14 Post-tensioned slabs should be constructed and maintained in accordance with the publication *Construction and Maintenance Manual for Post-Tensioned Slab-on-Ground Foundations* by the Post-Tensioning Institute. Particular attention should be paid to the "Property Owner Maintenance" and "Landscaping" sections of the Manual.

8.3 Slab-on-Grade Construction

8.3.1 Conventional interior slab-on-grade floors are not recommended due to the expansive nature of the native soils. Slabs-on-grade in garages should be underlain by a minimum 6 inches of ¾ inch clean crushed rock or compacted aggregate base.

8.3.2 For slab-on-grade floor construction in areas where moisture sensitive materials will be stored directly on the slab, a capillary break and cushion layer should be constructed between the floor slab and the compacted soil building pad. This capillary break should consist of a vapor retarder (as described above), underlain in turn by 6 inches of clean crushed gravel or compacted aggregate base. A layer of clean sand over the vapor retarder is optional.

8.4 Exterior Slab-On-Grade Construction

8.4.1 Exterior flatwork should have minimum thicknesses of 4 full inches and should be reinforced as directed by the architect/engineer.

8.4.2 For exterior non-traffic bearing concrete slabs-on-grade such as sidewalks and patios, the flatwork should be underlain by a minimum 4-inch layer of compacted, non-expansive material such as aggregate base. A greater thickness of non-expansive material would enhance flatwork performance. Prior to placement of the non-expansive material, the soil in the flatwork area should be above optimum moisture content, and no desiccation cracks should be present.

8.4.3 Assuming that movement (i.e., ¼-inch or more) of exterior flatwork is acceptable, the flatwork should be designed to be independent of the building foundations. The flatwork should not be doweled to foundations, and a separator should be placed between the two.

8.4.4 To reduce shrinkage cracks in concrete, the concrete aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the concrete should be properly placed and finished, contraction joints should be installed, and the concrete should be properly cured. Concrete materials, placement and curing specifications should be at the direction of the architect/engineer.

8.5 Pavement Sections

Asphalt Pavement

8.5.1 A bulk sample of the surficial material was tested for a Resistance Value (R-Value) test, resulting in an R-Value of 9. For design considerations, an R-Value of 5 was selected to account for variations in subgrade soil conditions. The asphalt concrete (AC) sections were designed in accordance with the Caltrans Highway Design Method

for Traffic Indices (TIs) of 4 through 7. Determination of the appropriate TI for each area to be paved is the province of the architect/engineer. The calculated base and AC thicknesses are for compacted material. Normal Caltrans construction tolerances should apply. The aggregate base should conform to Caltrans Class 2.

AC Pavement Sections
(R-Value - 5)

R-Value	Traffic Index	AC Thickness	Class 2 Base Thickness
5	4.0	2.5"	7.5"
5	4.5	2.5"	9.5"
5	5.0	3.0"	10.0"
5	5.5	3.0"	12.0"
5	6.0	3.5"	12.5"
5	6.5	3.5"	14.0"
5	7.0	4.0"	15.0"

Concrete (PCC) Pavements

8.5.2 Portland Cement Concrete (PCC) pavements in automobile parking areas should be at least 4 inches thick. Lightly loaded concrete pavements, subjected primarily to automobile traffic, should be a minimum 5 inches thick. Concrete pavement which will experience periodic truck traffic, such as garbage truck or moving van routes, should be a minimum of 6 inches thick.

8.5.3 Reinforcing of the concrete is optional. The concrete should have a minimum modulus of rupture of 650 psi. Construction joints should be doweled. The concrete pavement sections should be underlain by a minimum of 6 inches of compacted Class 2 aggregate base. A modulus of subgrade reaction of 150 pci may be assumed in the design of the concrete pavements.

General Conditions

8.5.4 Since the anticipated subgrade soils comprise expansive clays, the existing subgrade soils may have elevated moisture contents at the time of construction, making it difficult to achieve the recommended compaction. It may be necessary to aerate the soil to bring the moisture content to within the compactable range prior to recompaction. Over-excavation and replacement with additional aggregate base, the use of geosynthetic materials such as geogrid, and lime treatment are additional

mitigation measures that may be necessary. Additional recommendations can be prepared once site grading of the proposed pavement areas begins.

8.5.5 The subgrade soil should be scarified 8 inches, moisture conditioned as necessary and be compacted to the recommendations in Section 8.1.9. Aggregate base should be compacted to at least 95 percent of maximum dry density.

8.5.6 The subgrade and base should be firm and unyielding when proof-rolled with heavy, rubber-tired equipment prior to paving. The subgrade soils should be periodically moistened as necessary prior to placement of the aggregate base to maintain the soil moisture content near optimum.

8.5.7 Pavement longevity will be enhanced if the surface grade drains away from the edges of the pavement. Finished AC surfaces should slope toward drainage facilities at 2 percent where practicable, but in no case should water be allowed to pond.

8.5.8 Cutoff walls below curbs and around landscape islands should be constructed to extend the life of both asphalt and concrete pavement by reducing irrigation water and runoff that seeps into the aggregate base. Where utilized, cutoff walls should extend through the aggregate base to penetrate a minimum of 4 inches into the subgrade soils.

8.6 Utility Trenches

8.6.1. It is assumed that utility pipes will be properly bedded and shaded at least 6 inches over the top of the pipe with an approved, imported, granular material. For purposes of this discussion, trench backfill is defined as that portion of the backfill material placed above the import shading material. It is further assumed that the trenches will not exceed about 10 feet in depth.

8.6.2. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utility pipes. The site soils may be used for trench backfill above the select material. If obtaining compaction is difficult with the site soils, use of more easily compacted sand may be desirable. The upper foot of backfill should consist of native material to reduce the potential for seepage of water into the backfill except under slabs and pavements

8.6.3. Trench backfill should be compacted to a minimum of 90 percent of maximum dry density. The existing native soils may be used for trench backfill if properly prepared

and compacted. Jetting to compact utility trench backfill should not be allowed. Jetting of granular shading material around corrugated pipes and multiple conduit joint pipes may be considered.

8.6.4. Import sand or pea gravel may also be used as trench backfill, if so desired. The pea gravel should be clean, washed and rounded, and will require mechanical compaction with vibratory plates. Existing soil and import materials, such as sand or quarry fines, will also require mechanical compaction, and may require moisture conditioning prior to compaction operations.

8.6.5. Where utility trenches extend under perimeter foundations, the trenches should be backfilled entirely with native soil compacted to a minimum of 90 percent of maximum dry density. The zone of native soil should extend to a minimum distance of 2 feet on both sides of the foundation. If utility pipes pass through sleeves cast into the perimeter foundations, the annulus between the pipes and sleeves should be sealed.

8.6.6. In landscape areas, at least the final 24 inches of backfill should be compacted, approved fill soil, to reduce the potential for surface rain or irrigation water from rapidly penetrating down into the trench. Under pavement areas the top 12 inches should be compacted, approved fill soil.

8.6.7. Where trenches pass from landscape areas to pavement areas, at least a three foot length of trench, centered on the curb line, should be backfilled with native soil to reduce the potential for lateral migration of water from the planter to the pavement area.

8.7 Site Drainage and Finish Improvements

8.7.1 Unpaved ground surfaces should be finish graded to direct surface runoff away from building foundation improvements at a minimum 5 percent grade for a minimum distance of 10 feet. If this is not practicable due to the terrain or other site features, swales with improved surfaces should be provided to divert drainage away from improvements. The landscaping should be planned and installed to maintain proper surface drainage conditions.

8.7.2 Runoff from driveways, roof gutters, downspouts, planter drains and other improvements should discharge in a non-erosive manner away from foundations, pavements, and other improvements.

8.7.3 Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means during and following construction is essential to protect the site from erosion damage. Care should be taken to establish and maintain vegetation.

8.7.4 Raised planter beds adjacent to foundations should be provided with sealed sides and bottoms so that irrigation water is not allowed to penetrate the subsurface beneath foundations. Outlets should be provided in the planters to direct accumulated irrigation and rain water away from foundations.

8.7.5 Open areas adjacent to exterior flatwork should be irrigated or otherwise maintained so that relatively constant moisture conditions are created throughout the year. Irrigation systems should be controlled to the minimum levels that will sustain the vegetation without saturating the soil.

8.8 Geotechnical Observation and Testing

8.8.1 It must be recognized that the recommendations contained in this report are based on a limited number of borings performed by Earth Systems Pacific, and rely on continuity of the subsurface conditions encountered.

8.8.2 It is assumed that the Geotechnical Engineer will be retained to provide consultation during the design phase, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.

8.8.3 Unless otherwise stated, the terms "compacted" and "recompacted" refer to soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent of maximum dry density. The standard tests used to define maximum dry density and field density should be ASTM D 1557-09 and ASTM D 6938-10, respectively, or other methods acceptable to the geotechnical engineer and jurisdiction.

8.8.4 "Moisture conditioning" refers to adjusting the soil moisture to at least optimum moisture, or as recommended in this report, prior to application of compactive effort. If the soils are overly moist so that they become unstable, or if the recommended compaction cannot be readily achieved, drying the soil to optimum moisture content or just above may be necessary. Placement of gravel layers, geotextiles, or lime treatment may also be necessary to help stabilize unstable soils. The Geotechnical Engineer should be contacted for recommendations for mitigating unstable soils.

8.8.5 At a minimum, the following should be provided by the Geotechnical Engineer:

- Review of grading and foundation plans and details as they near completion
- Professional observation during site preparation, grading, and foundation excavation
- Oversight of soil compaction testing during grading
- Oversight of soils special inspection during grading

8.8.6 Special inspection of grading should be provided as per Section 1704.7 and Table 1704.7 of the CBC; the soils special inspector should be under the direction of the Geotechnical Engineer. The amount of coverage to be provided will be determined during the grading operations. The following operations should be subject to soils special inspection:

- Stripping and clearing of vegetation and deleterious materials
- Scarification, moisture conditioning and recompaction
- Observation of the over-excavation of wet, loose, or disturbed soils and undocumented fills
- Fill placement and compaction
- Proposed imported materials
- Foundation excavations
- Compaction and proof rolling pavement subgrade and aggregate base
- Utility trench backfill compaction
- Retaining wall backfill compaction

8.8.7 It will be necessary to develop a program of quality control prior to beginning grading. It is the responsibility of the owner, contractor, or project manager to determine additional inspection items required by the architect/engineer or the governing jurisdiction.

8.8.8 A preconstruction conference among a representative of the owner, the Geotechnical Engineer, soil special inspector, the architect/engineer, and contractors is recommended to discuss planned construction procedures and quality control requirements. Earth Systems Pacific should be notified at least 48 hours prior to beginning grading operations.

8.8.9 If Earth Systems Pacific is not retained to provide construction observation and testing services, it will not be responsible for the interpretation of the information by others or any consequences arising there from.

9.0 CLOSURE

This report is valid for conditions as they exist at this time for the type of project described herein. Our intent was to perform this study in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the Scope of Services section. Application beyond the stated intent is strictly at the user's risk.

If changes with respect to the project type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions stated in this report are not correct, Earth Systems Pacific should be notified for modifications to this report. Items not specifically addressed in this report should comply with the California Building Code and the requirements of the governing jurisdiction.

As detailed plans for the proposed residential subdivision were not available at the time of this report, the recommendations contained herein should be reviewed and revised as necessary by the Geotechnical Engineer once final plans for the proposed improvements become available.

The recommendations of this report are based upon the geologic and geotechnical conditions encountered during this study and previous studies by others, and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by Earth Systems Pacific based on conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report should be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and his authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. Please feel free to contact this office at your convenience if you have any questions regarding this report.

End of Text

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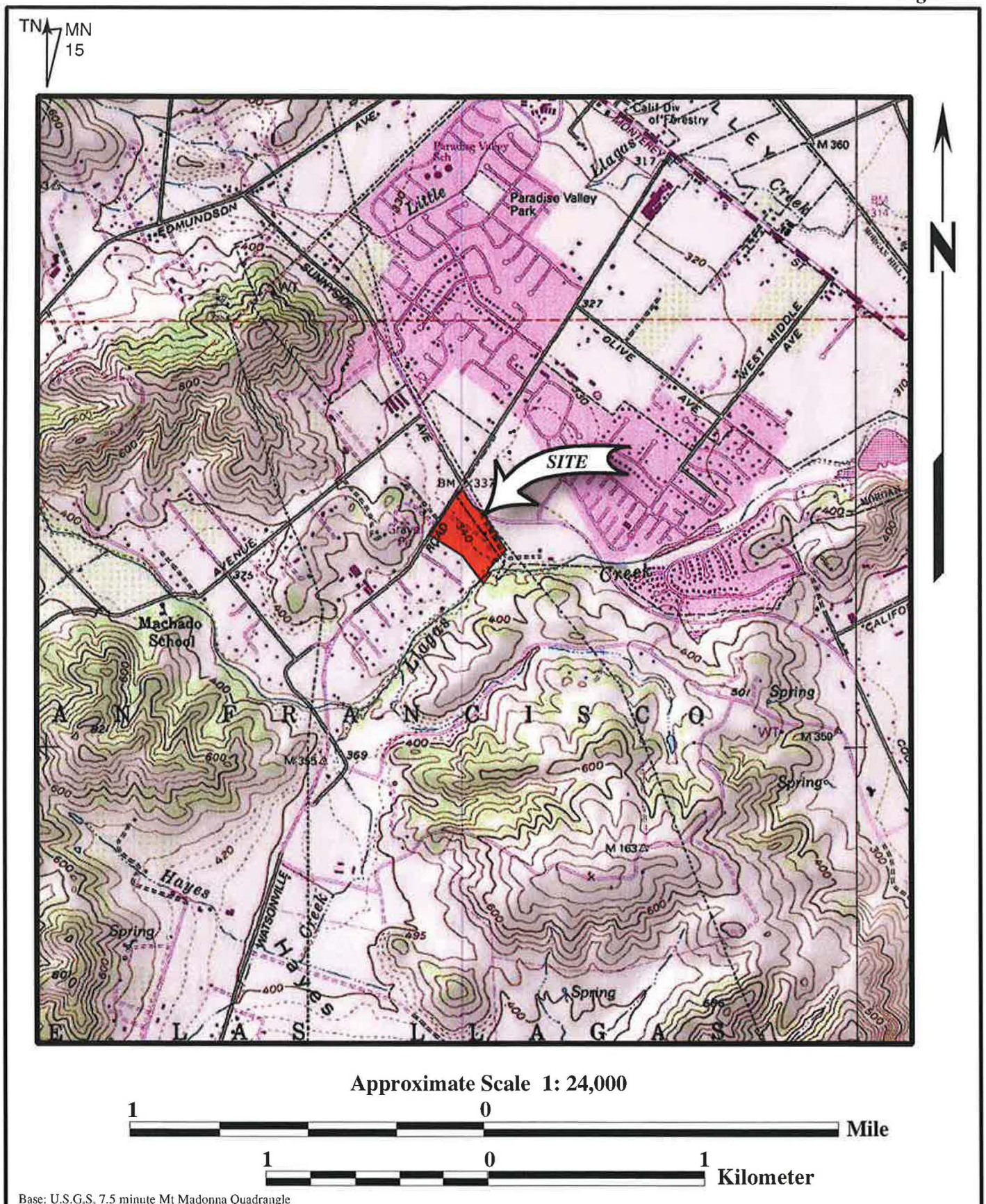
Aerial Photographs (Stereo Pairs)

Date	Scale	Type	Source	Ref. No.
6/12/56	1:24,000	B&W	ESP Archives	CIV-7R-157/158
8/25/70	1:48,000	B&W	ESP Archives	AV-965-16-41/42
5/10/88	1:12,000	B&W	ESP Archives	AV-3281-5-15/16

FIGURES

Figure 1



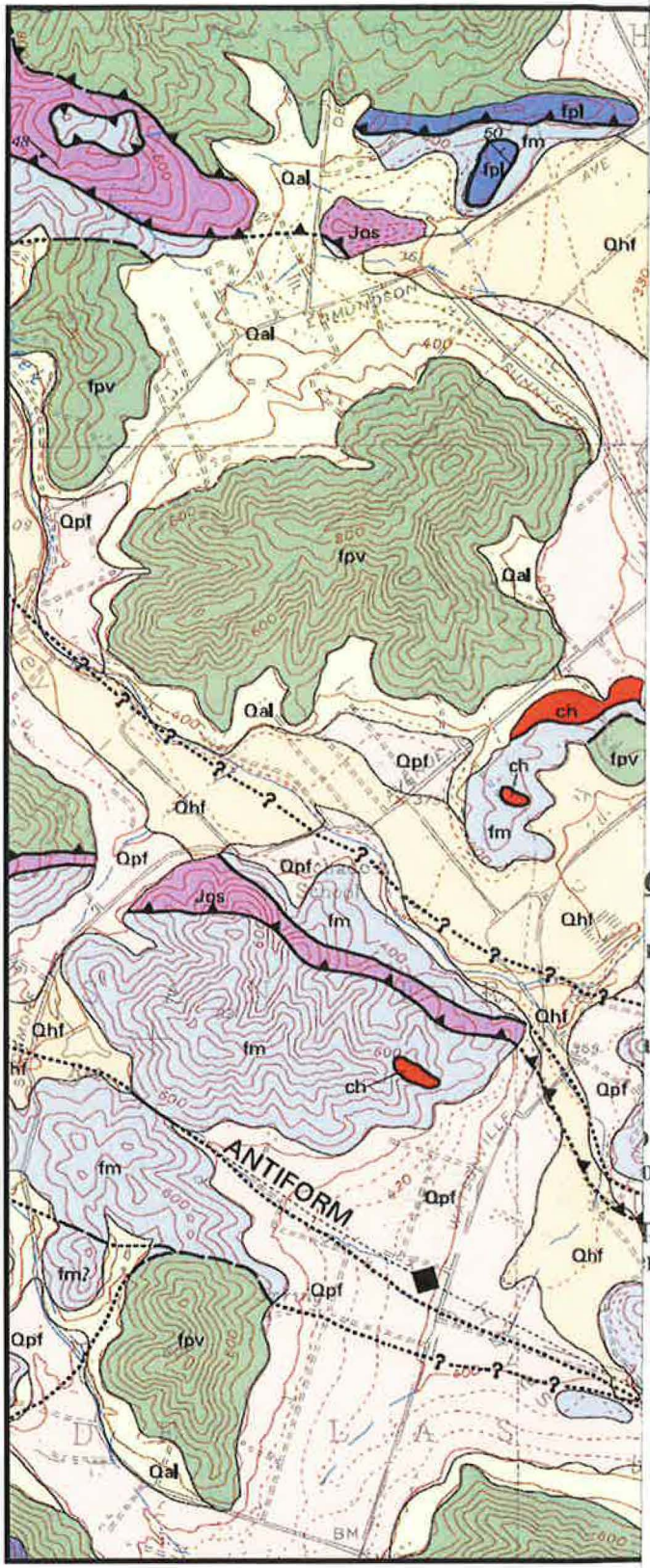
Approximate Scale 1: 24,000

1 0 Mile

1 0 1 Kilometer

Base: U.S.G.S, 7.5 minute Mt Madonna Quadrangle
Map created with Topo!" © 2003 National Geographic (www.nationalgeographic.cm/topo)

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**Site Location Map** **SH-11788-SA**



Base: McLaughlin et. al, (2001)

ND

Franciscan Complex (Cretaceous and Jurassic)

fm — **Mélange of the Central Belt (Upper Cretaceous)**

ch — **Chert blocks**

Permanente Terrane (Cretaceous)

fpl — **Foraminiferal limestone (Upper and Lower Cretaceous)**

fpv — **Volcanic rocks (Lower Cretaceous)**

OLS

mate, dotted where concealed, queried where

te, dotted where concealed, queried where

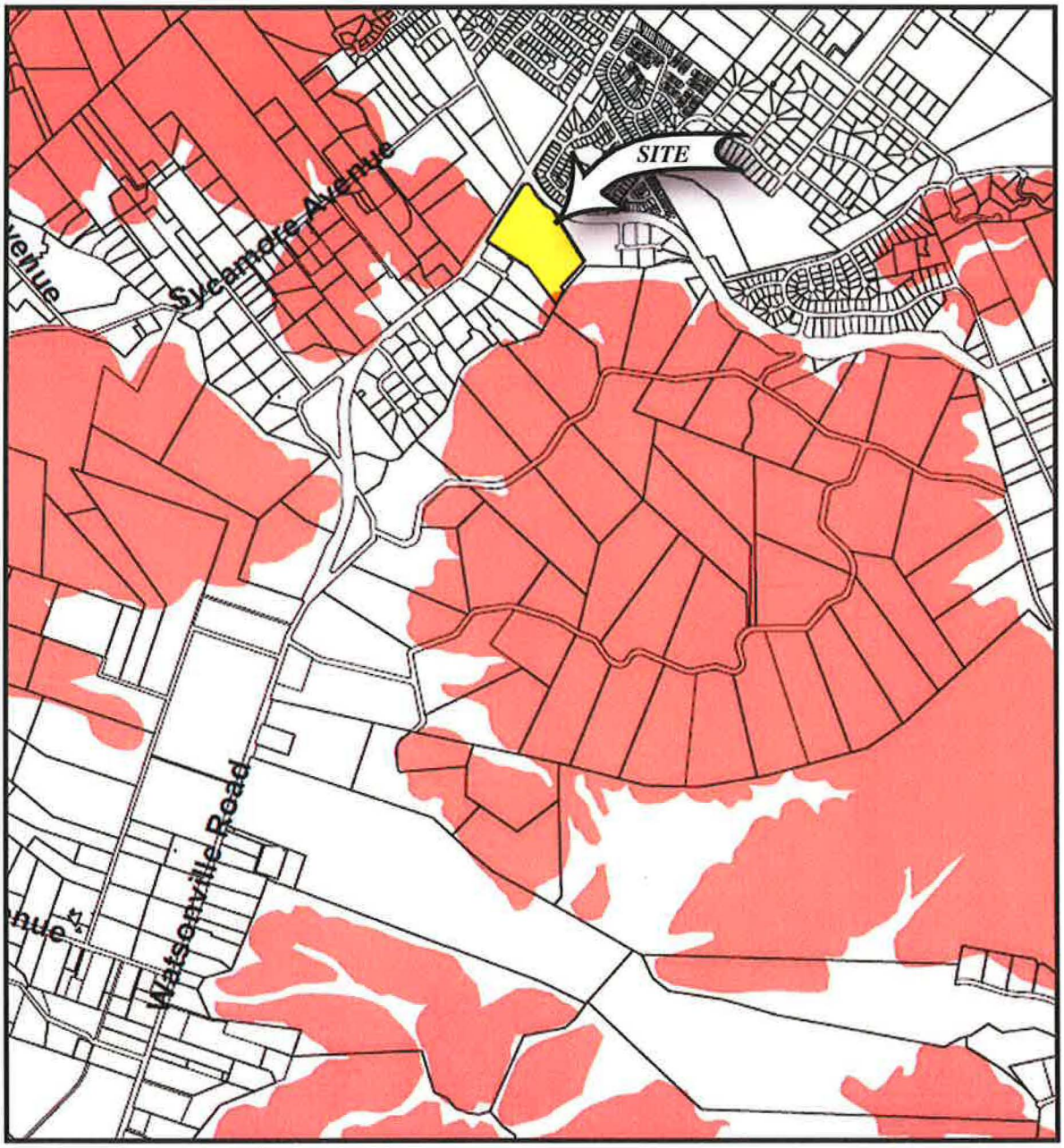
proximate, dotted where concealed, queried own-dropped side

proximate, dotted where concealed, queried r plate

gic Map

Earth Systems Pacific

00 | **SH-11788-SA**

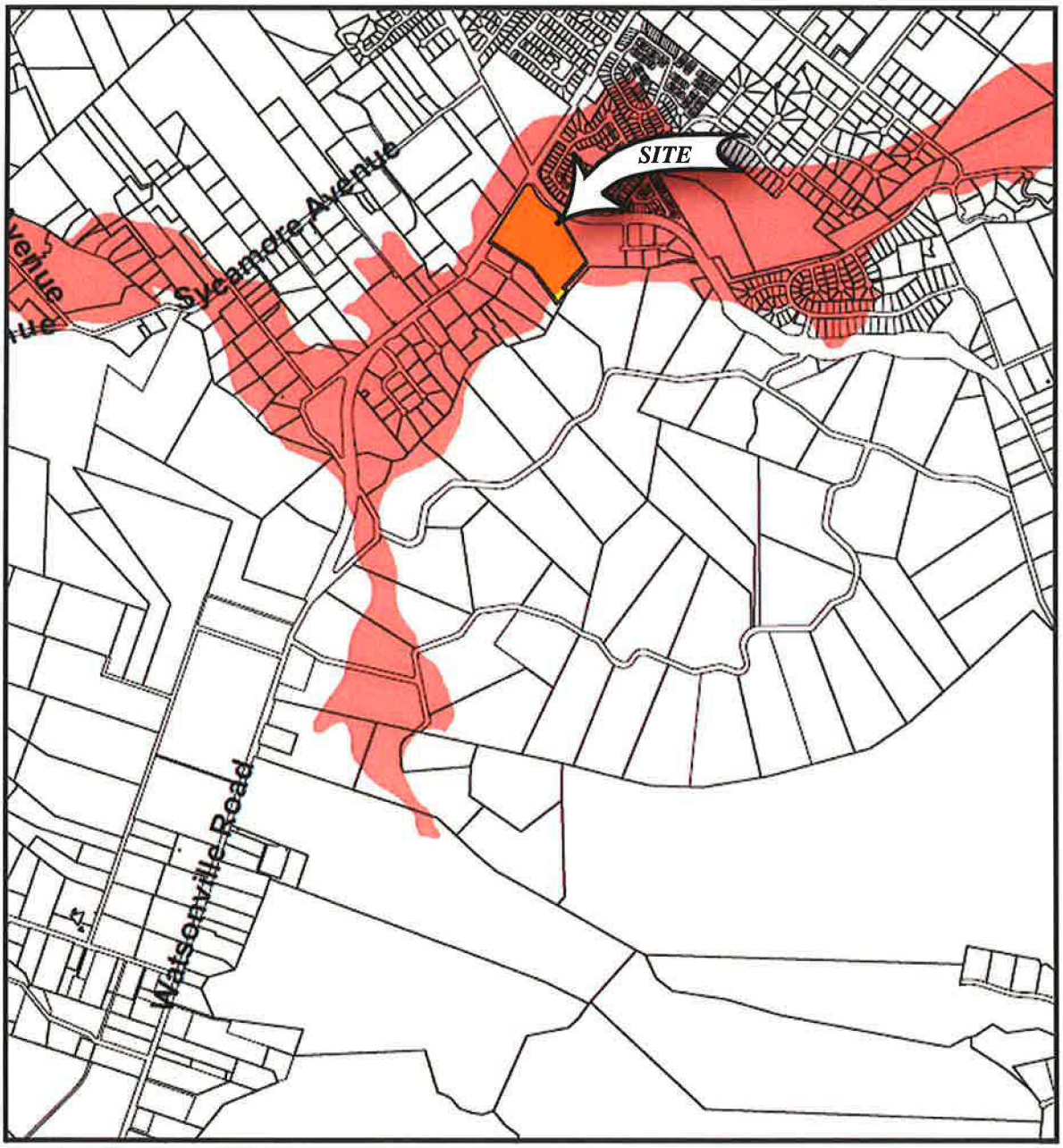


Base: Santa Clara County (2002b)

Landslide Hazard Zones

2000 0 2000
Approximate Scale in Feet

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**Landslide Hazard Map** **SH-11788-SA**



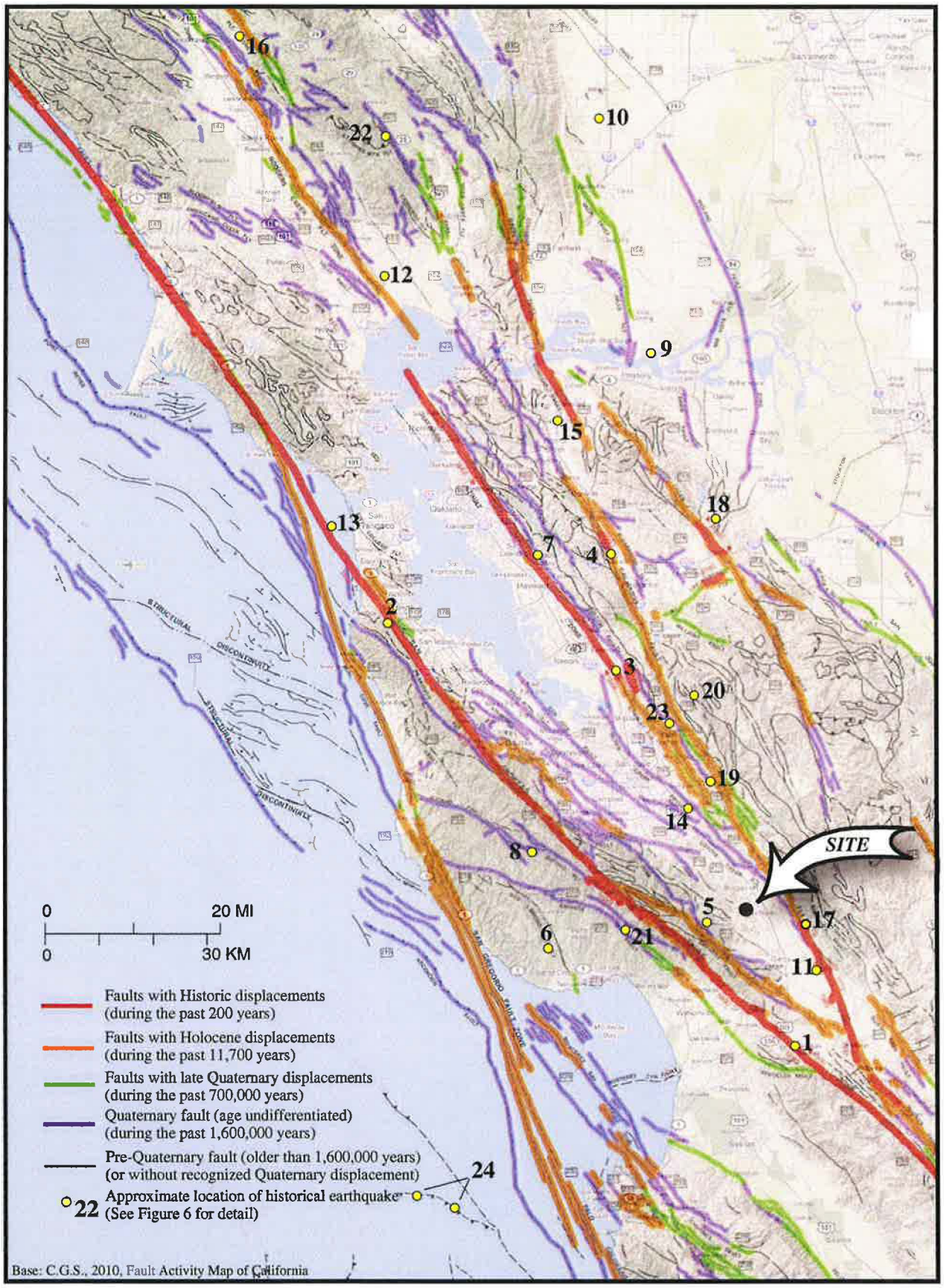
Base: Santa Clara County (2002c)

Liquefaction Hazard Zones

2000 0 2000
Approximate Scale in Feet

Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Liquefaction Hazard Map** **SH-11788-SA**

Figure 5



Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Regional Faults and Earthquakes** **SH-11788-SA**

Selected San Francisco Bay Area Earthquakes

Location Number (Refer to Figure 5)	Earthquake and Year	Magnitude Reported	Reference
1	Monterey Bay Area, 1836	M 6.8	Toppozada, 1998
2	San Francisco, 1838	M 7.0	Toppozada, 1981
3	Hayward, 1858	M 6.1	Toppozada, 1981
4	Calaveras-Dublin, 1861	M 5.9	Toppozada, 1981
5	Santa Clara Valley, 1864	M 5.9	Toppozada, 1981
6	Santa Cruz, 1865	M 6.3	Toppozada, 1981
7	Hayward, 1868	M 6.8	Toppozada, 1981
8	San Andreas, 1870	M 5.8	Toppozada, 1981
9	Antioch-Collinsville		
	1889	M 6.0	Toppozada, 1981
	1965	M 4.9	Toppozada, 1981
10	Vacaville-Winters, 1892	M 6.4	Toppozada, 1981
11	Calaveras, 1897	M 6.2	Toppozada, 1981
12	Mare Island, 1898	M 6.5	Goter, 1988
13	San Francisco, 1906	M 7.8	U.S. Geological Survey, 2010
14	San Jose, 1911	M 6.5	Toppozada and Parke, 1982
15	Concord, 1955	M 5.4	Tocher, 1959
16	Santa Rosa, 1969	M 5.6	Cloud, 1970
17	Coyote Lake, 1979	M 5.9	Hart, 1988
18	Greenville, 1980	M 5.8	Oppenheimer, 1990
19	Morgan Hill, 1984	M 6.2	Oppenheimer, 1990
20	Mount Lewis, 1986	M 5.7	U.S. Geological Survey, 1989
21	Loma Prieta, 1989	M 7.1	U.S. Geological Survey, 1989
22	Napa, 2000	M 5.2	U.S. Geological Survey, 2000
23	Calaveras Reservoir, 2007	M 5.4	U.S. Geological Survey, 2009
24	Monterey Bay		
	1926	M6.1	NCDEC, 2010
	1926	M6.1	NCDEC, 2010

NOTE: Modified After Geomatrix, (1992)
Update, USGS, 2010

Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Selected Earthquakes** **SH-11788-SA**

MODIFIED MERCALLI INTENSITY SCALE

MMI Value	Summary Damage Description Used on 1995 Maps	2003 Description of Shaking Severity	Full Description
I			Not felt. Marginal and long period effects of large earthquakes.
II			Felt by persons at rest, on upper floors, or favorably placed.
III			Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV			Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frames creak.
V	Pictures Move	Light	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Objects Fall	Moderate	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knicknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and Masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly or heard to rustle).
VII	Nonstructural Damage	Strong	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to Masonry D, including cracks. Weak chimneys broken off at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in Masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	Moderate Damage	Very Strong	Steering of motor cars affected. Damage to Masonry C; partial collapse. Some damage to Masonry B, none to Masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	Heavy Damage	Violent	General panic. Masonry D destroyed; Masonry C heavily damaged, sometimes with complete collapse; Masonry B seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames cracked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	Extreme Damage	Very Violent	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI			Rails bent greatly. Underground pipelines completely out of service.
XII			Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together using steel, concrete, etc.; designed to resist lateral forces.

Masonry B: Good workmanship and mortar; reinforced, but not designed to in detail to resist lateral forces.

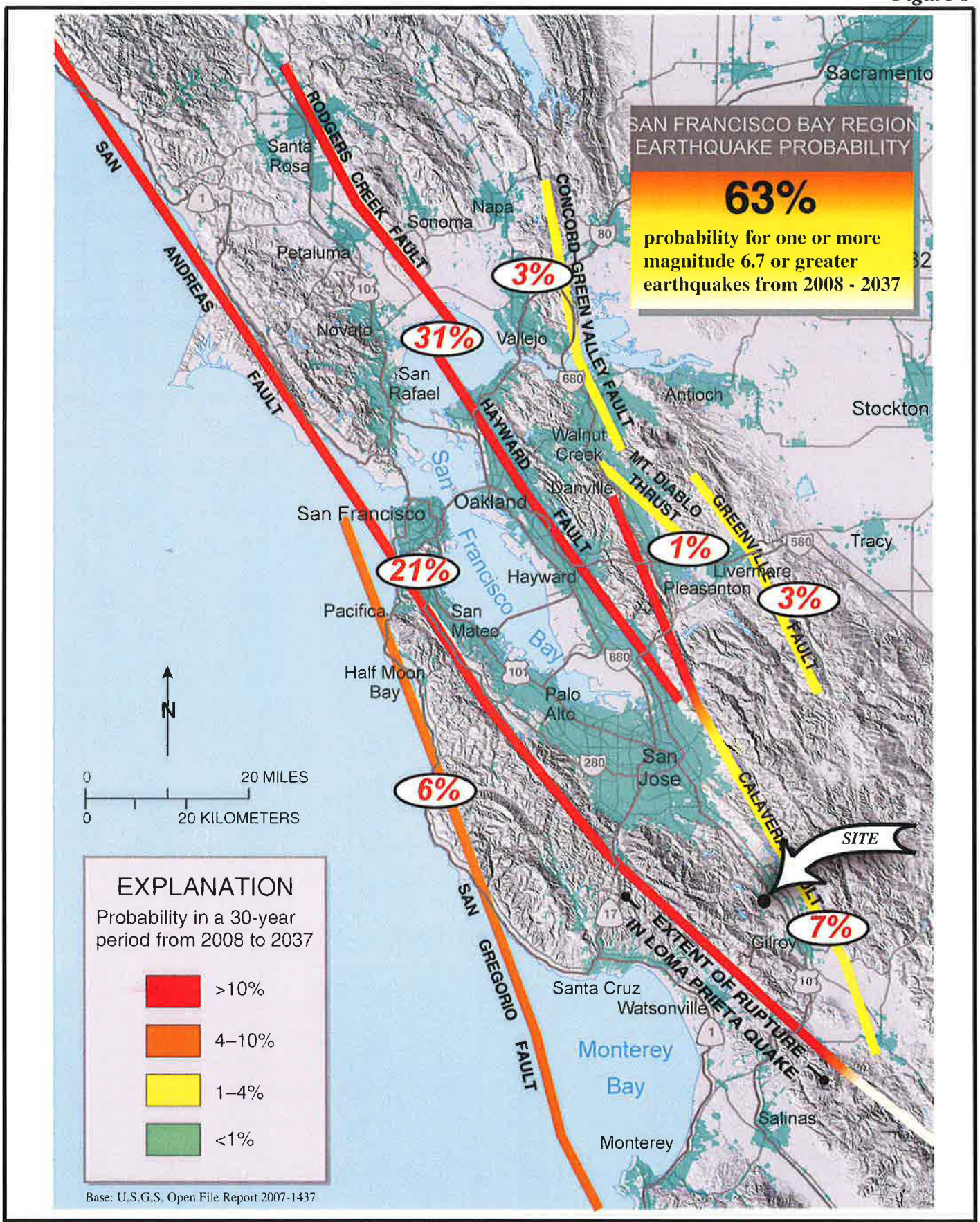
Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.

Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

Source: Association of Bay Area Governments (2003)

Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Modified Mercalli Intensity Scale** **SH-11788-SA**

Figure 8



Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Earthquake Probability** **SH-11788-SA**

Figure 9

LEGEND

Qhf Holocene fan deposits

Qpf Pleistocene fan deposits

— — Approximate geologic contac

Areas within Zone AE on FE
Flood-Insurance Rate Map (2
(areas subject to inundation b
annual chance flood)
See Figure 10

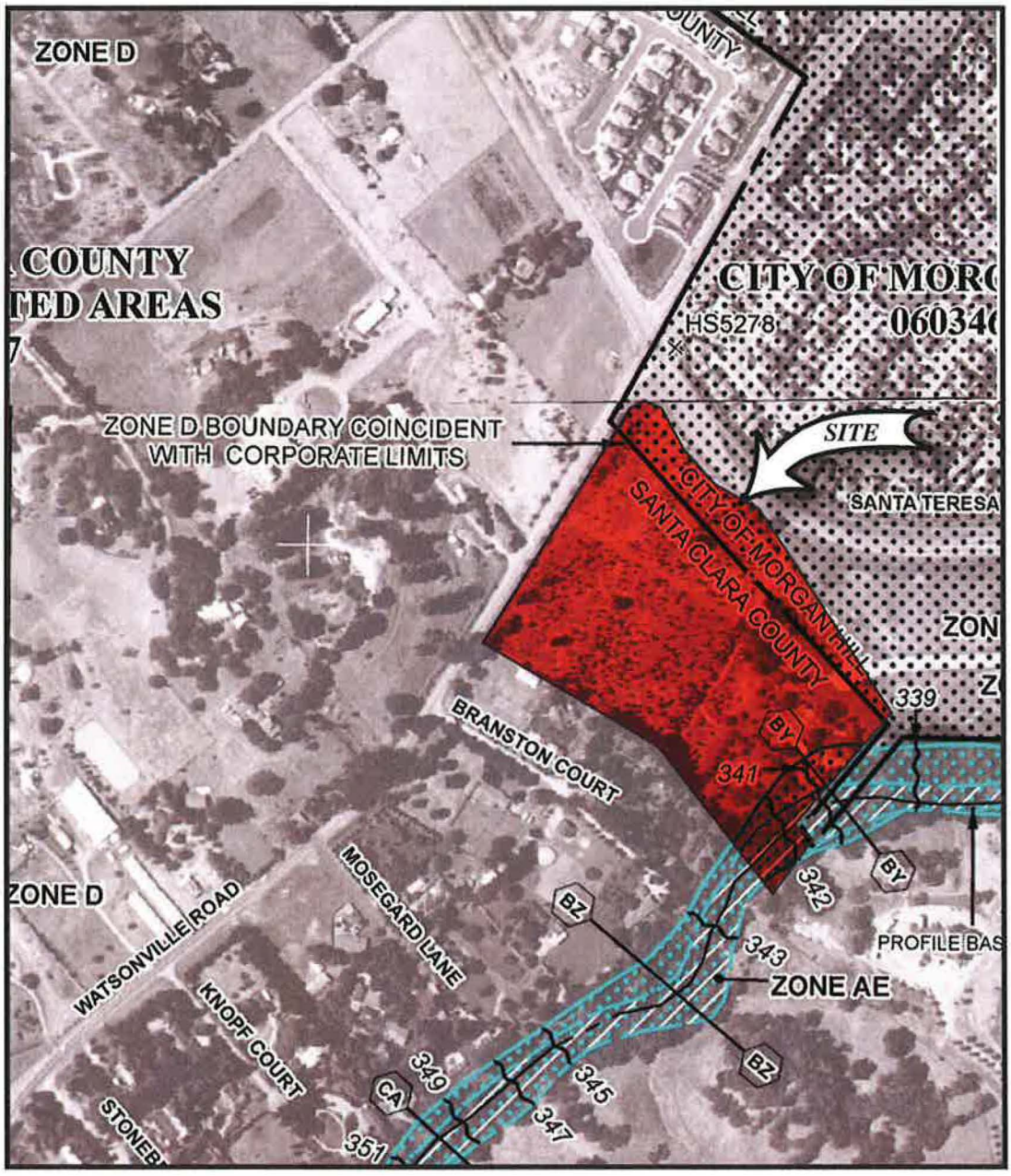
B7 Approximate boring location

Base: Precise Development Plan - Quail Vineyards - HMH (2011)
Geology: McLaughlin et al, 2001 and ESP (this study)

Earth Systems Pacific

et

SH-11788-SA



Base: FEMA (2009; Panel 06001C 0607H and 0609H)

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

ZONE AE — Base Flood Elevations determined.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

ZONE D — Areas where flood risk is undetermined, but possible

500 0 500

Approximate Scale in Feet

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**FEMA Flood Insurance Rate Map** **SH-11788-SA**

APPENDIX A

Boring Logs (7)

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 1
PAGE 1 OF 2
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown lean clay with sand, fine sand fraction, moist, hard	0.5–2.0	1–1	■	108.6	16.1	76	4.5
5	CL		–becoming more brown	3.5–5.0	1–2	■	109.7	19.5	50	4.5
10	CL		–changing to light brown, increasing sand fraction to sandy lean clay	8.5–10.0	1–3	■	105.6	22.9	78	–
12			▼							
15	GW–GC		–gravels encountered Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, wet, medium dense	13.5–15.0	1–4	■	128.0	11.8	53	–
20	GW–GC			18.5–20.0	1–5	●	–	14.0	45	–
23										
25	GC–SC		Brown clayey gravel with sand to clayey sand with gravel, wet, medium dense to dense	23.5–25.0	1–6	●	–	11.3	50/6	–
26	GC–SC		–decreasing gravels							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 1
PAGE 2 OF 2
JOB NO.: SH-11788-SA
DATE: 05/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
27	GC–SC		(see previous description)							
28										
29	SP–SC		Light brown poorly graded sand with clay and gravel to clayey sand with gravel, wet, dense	28.5–30.0	1–7	●	–	19.3	54	
30										
31										
32			–slow drilling Dark gray shale, very hard							
33										
34			End of Boring @ 33.5' Free subsurface water @ 13.5'	33.5–33.7	1–8	●	–	–	50/1	
35										
36										
37										
38										
39										
40										
41										
42										
43										
44										
45										
46										
47										
48										
49										
50										
51										
52										
53										

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 2
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown lean clay with sand, moist, hard	0.5–2.0	2–1	■	101.0	15.6	34	4.0
5			–lighter brown	3.5–5.0	2–2	■	111.0	17.6	35	3.5
10	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, moist, medium dense	8.5–10.0	2–3	■	113.3	6.4	53	–
15	SC		Brown clayey sand, trace fine and coarse gravels, wet, medium dense to dense	13.5–15.0	2–4	■	124.2	14.2	47	–
			End of Boring @ 15.0' Free subsurface water @ 12.5'							

LEGEND: ■ 2.5" Mod Cal Sample ◯ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 3
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown to brown sandy lean clay, trace fine gravels, sand fraction fine to medium, moist, hard	0.5–2.0	3–1	■	106.4	12.5	48	4.0
5	SP–SC		Brown poorly graded sand with clay to clayey sand, moist to very moist, loose	3.5–5.0	3–2	■	98.1	12.2	17	3.5
10	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, wet, medium dense	8.5–10.0	3–3	■	127.4	8.4	35	–
15			–cobbles encountered, sandy clay lenses present	13.5–15.0	3–4	■	123.4	15.2	50/3	–
20				18.5–20.0	3–5	■	–	12.6	70	–
			End of Boring @ 20.0'							
			Free subsurface water @ 13.5'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 4
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0–8	CL		Brown sandy lean clay, moist, very stiff	0.5–2.0	4–1	■	115.4	16.0	28	4.25
			—more moist, with trace rounded gravels	3.5–5.0	4–2	■	117.3	12.2	19	–
8–12	SP–SC		Brown poorly graded sand with clay, very moist, medium dense	8.5–10.0	4–3	■	106.3	10.3	36	–
12–15	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, moist, medium dense (▼ water)							
			—cobble at end of sample	13.5–15.0	4–4	■	146.6	12.2	50/5	–
15			End of Boring @ 15.0' Free subsurface water @ 12.0'							

LEGEND: ■ 2.5" Mod Cal Sample ◯ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 5
PAGE 1 OF 1

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown to brown lean clay with sand, sand fraction fine to medium, moist, hard	0.5–2.0	5–1	■	105.4	20.2	41	4.0
5			–lighter brown in color, increasing sand, more moist	3.5–5.0	5–2	■	110.2	19.9	44	2.75
7	SC–GC		–increasing sand content Dark brown to brown clayey sand with gravel to clayey gravel with sand, sand fraction medium to coarse, gravel fraction fine to coarse, very moist, dense	8.5–10.0	5–3	■	113.5	18.8	50/5	–
15			–as above with sand lenses, wet, dense	13.5–15.0	5–4	■	106.9	25.4	50/5	–
17	CL–SC		–slow drilling Brown sandy clay to clayey sand with clasts of dark gray shale, moist	18.5–20.0	5–5	■	–	–	54	–
20			End of Boring @ 20.0' Free subsurface water @ 12.0'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 6
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown lean clay with sand, trace gravel, moist, hard	0.5–2.0	6–1	■	112.9	12.6	69	4.5
4			–increase coarse gravel							
5	CL–SC		Reddish brown to brown sandy clay to clayey sand, very moist	3.5–5.0	6–2	■	107.4	7.9	31	–
9	GC–SC		Yellowish brown clayey gravel with sand to clayey sand with gravel, trace cobbles, very moist, medium dense	8.5–10.0	6–3	■	116.5	7.7	42	–
12			▼							
13	GP–SP		Poorly graded sands to gravels, slight clay, wet, dense,							
15			End of Boring @ 15.0'	13.5–15.0	6–4	■	134.3	4.0	50/3	–
			Free subsurface water @ 12'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 7
PAGE 1 OF 2
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0										
1–4	CH		Brown to slightly reddish–brown clay with sand, fine sand fraction, moist, hard							
5			–more gray–brown with black spotting	3.5–5.0	7–1	▬	113.1	16.8	48	4.5
6–9	CL		Gray–brown sandy clay, trace black spots and streaks, very moist, very stiff							
10				8.5–10.0	7–2	▬	103.3	22.3	36	–
11–12			▼							
13	SC		–gravels encountered							
14–16			Clayey sand with gravel, wet, medium dense							
15				13.5–15.0	7–3	▬	114.1	19.9	48	–
17–20	GC–SC		Gray–brown clay gravels with sand to clayey sand with gravels, gravel fraction fine to coarse, sand fraction coarse, wet, medium dense							
20				18.5–20.0	7–4	●	–	20.7	45	–
21–22			–slow drilling, cobbles and increased gravels encountered							
23–24			Dark gray shale, very hard							
24				23.5–24.5	7–5	●	–	–	50/3	–
25				24.5–	7–6	●	–	–	50/1	–
25–26			Drill refusal @ 24.5' Free subsurface water @ 12.0'							

LEGEND: ▬ 2.5" Mod Cal Sample ◯ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

Quail Vineyards Subdivision

SH-11788-SA
June, 2012

BULK DENSITY & MOISTURE TEST RESULTS

ASTM D 2937-10 (modified for ring liners)

SAMPLE NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
B1-1	1.5 - 2.0	16.1	126.1	108.6
B1-2	4.5 - 5.0	19.5	131.2	109.7
B1-3	9.5 - 10.0	22.9	129.8	105.6
B1-4	14.5 - 15.0	11.8	143.1	128.0
B1-5	19.5 - 20.0	14.0	---	---
B1-6	24.5 - 25.0	11.3	---	---
B1-7	29.5 - 30.0	19.3	---	---
B2-1	2.0 - 2.5	15.6	116.8	101.0
B2-2	4.5 - 5.0	17.6	130.6	111.0
B2-3	9.5 - 10.0	6.4	120.5	113.3
B2-4	14.5 - 15.0	14.2	141.8	124.2
B3-1	1.5 - 2.0	12.5	119.7	106.4
B3-2	4.5 - 5.0	12.2	110.1	98.1
B3-3	9.5 - 10.0	8.4	138.1	127.4
B3-4	14.0 - 14.5	15.2	142.1	123.4
B3-5	19.5 - 20.0	12.6	---	---
B4-1	1.5 - 2.0	16.0	133.8	115.4
B4-2	4.5 - 5.0	12.2	131.7	117.3
B4-3	9.5 - 10.0	10.3	117.3	106.3
B4-4	14.5 - 15.0	12.2	164.8	146.8
B5-1	1.5 - 2.0	20.2	126.6	105.4
B5-2	4.5 - 5.0	19.9	132.1	110.2
B5-3	9.5 - 10.0	18.8	134.8	113.5
B5-4	14.0 - 14.5	25.4	134.0	106.9
B5-5	9.5 - 10.0	9.6	---	---
B6-1	1.5 - 2.0	12.6	127.2	112.9
B6-2	4.5 - 5.0	7.9	115.9	107.4
B6-3	9.5 - 10.0	7.7	125.5	116.5
B6-4	14.0 - 14.5	4.0	139.7	134.3
B7-1	1.5 - 2.0	16.8	132.0	113.1
B7-2	4.5 - 5.0	22.3	126.3	103.3
B7-3	9.5 - 10.0	19.9	136.7	114.1
B7-4	14.0 - 14.5	20.7		

PLASTICITY INDEX TEST RESULTS

ASTM D 4318-10

BORING NO.	DEPTH feet	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	1.5 - 2.0	40	13	27

R-VALUE TEST RESULTS

ASTM D 2844-07/CAL Test 301

BORING NO.	DEPTH feet	R-VALUE	SOIL CLASSIFICATION
Bag A	0.5 - 2.5	26	Red brown lean CLAY with sand (CL)

Quail Vineyards Subdivision

SH-11788-SA

June, 2012

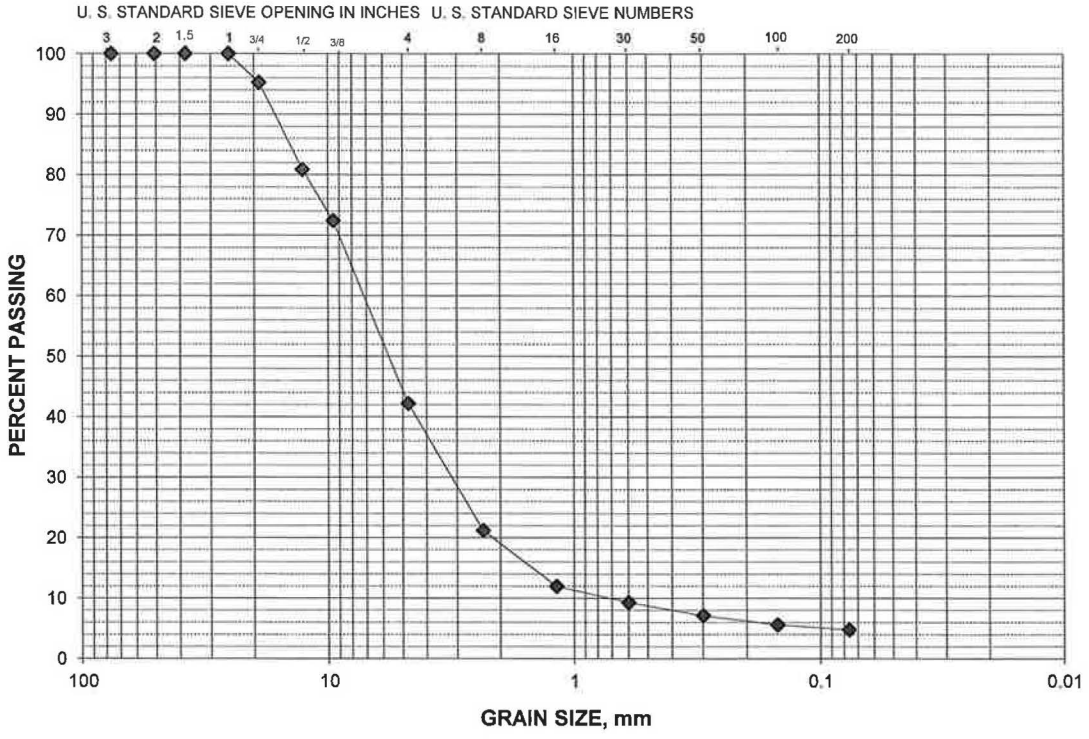
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-1 @ 14.5' - 15.0'

Well graded GRAVEL with silt and sand (GW-GM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	5	95
1/2"	19	81
3/8"	28	72
#4	58	42
#8	79	21
#16	88	12
#30	91	9
#50	93	7
#100	94	6
#200	95	5



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

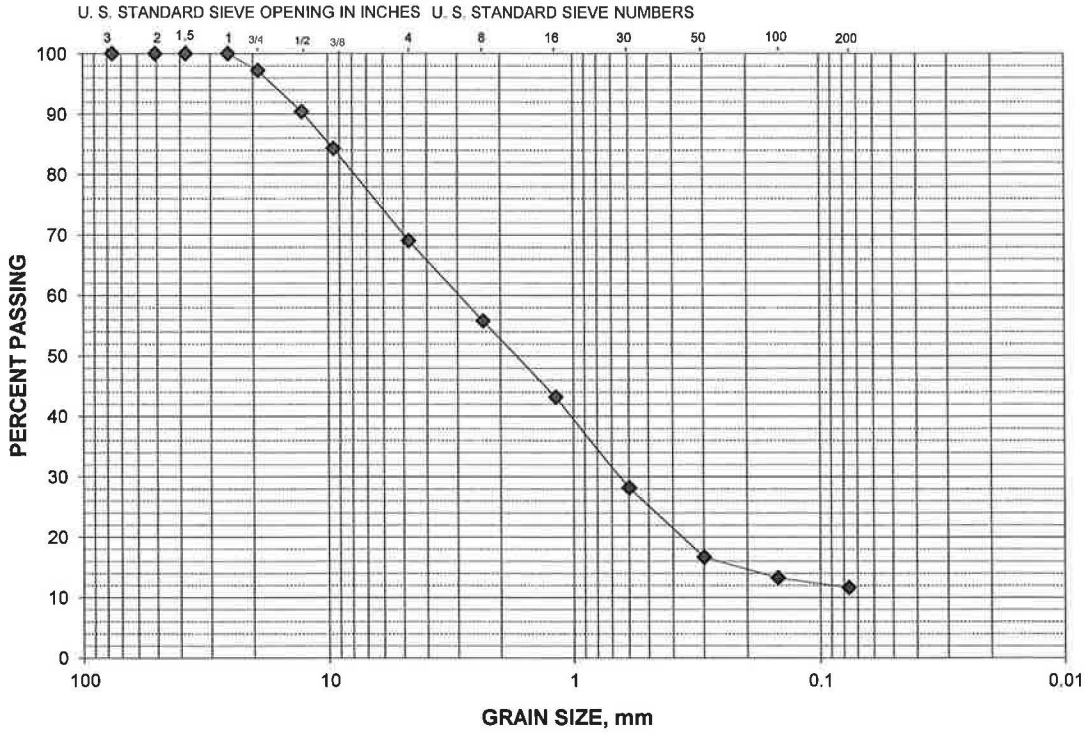
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-1 @ 29.5' - 30.0'

Poorly graded SAND with silt and gravel (SP-SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	3	97
1/2"	10	90
3/8"	16	84
#4	31	69
#8	44	56
#16	57	43
#30	72	28
#50	83	17
#100	87	13
#200	88	12



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

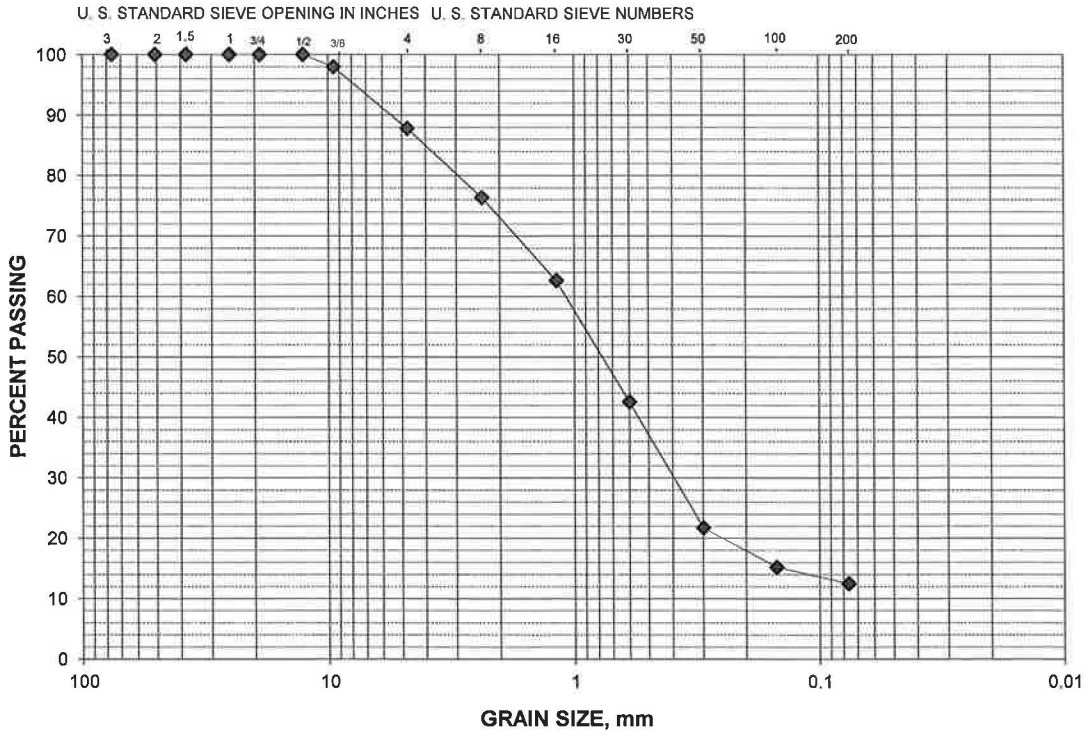
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-3 @ 4.5' - 5.0'

Poorly graded SAND with silt (SP-SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	2	98
#4	12	88
#8	24	76
#16	37	63
#30	57	43
#50	78	22
#100	85	15
#200	88	12



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

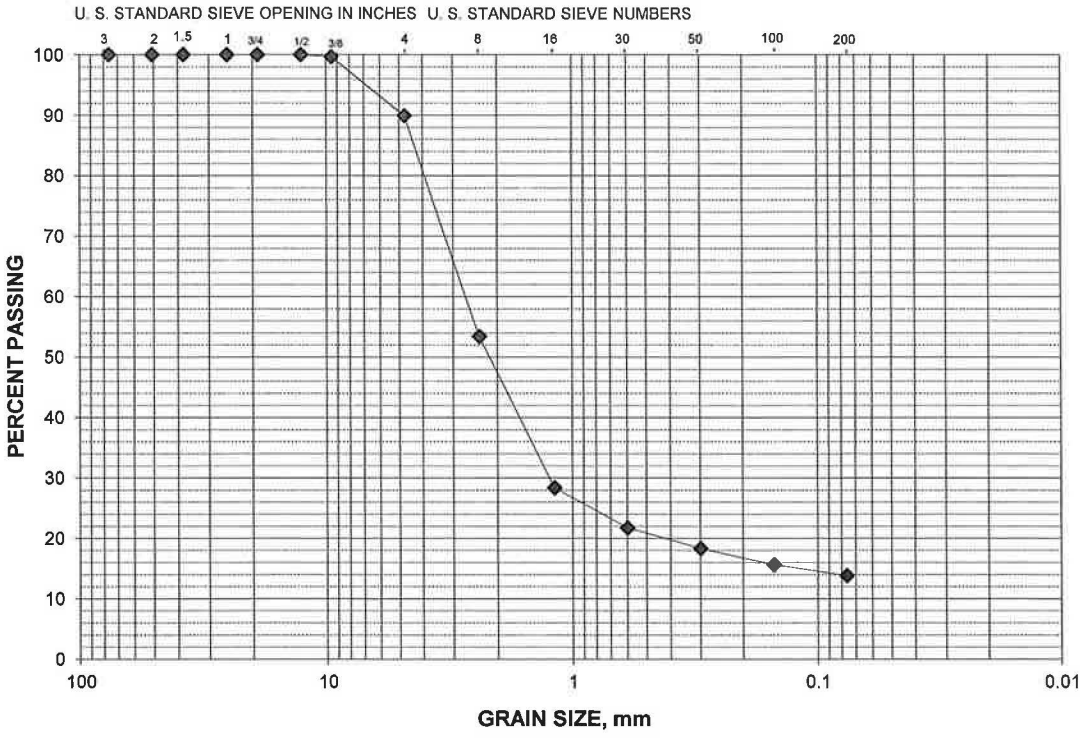
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-4 @ 9.5' - 10.0'

Poorly graded SAND with silt (SP-SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	0	100
#4	10	90
#8	47	53
#16	72	28
#30	78	22
#50	82	18
#100	84	16
#200	86	14



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

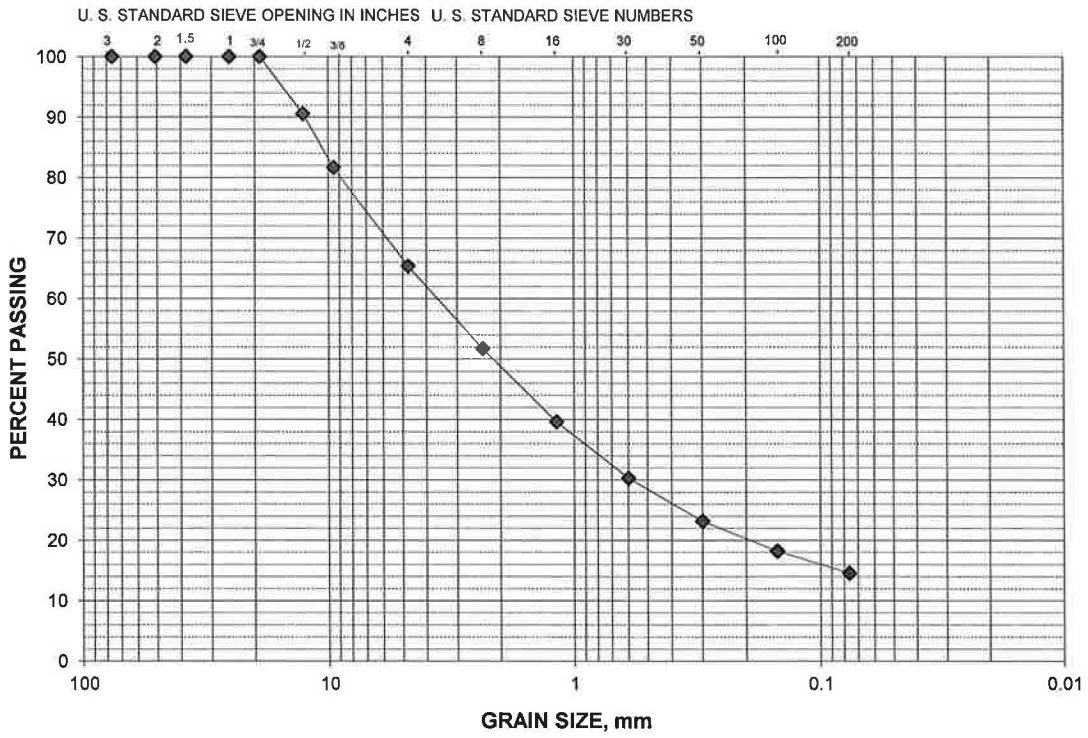
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-7 @ 9.5' - 10.0'

Silty SAND with gravel (SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	0	100
1/2"	9	91
3/8"	18	82
#4	35	65
#8	48	52
#16	60	40
#30	70	30
#50	77	23
#100	82	18
#200	85	15



Quail Vineyards Subdivision SH-11788-SA

DIRECT SHEAR

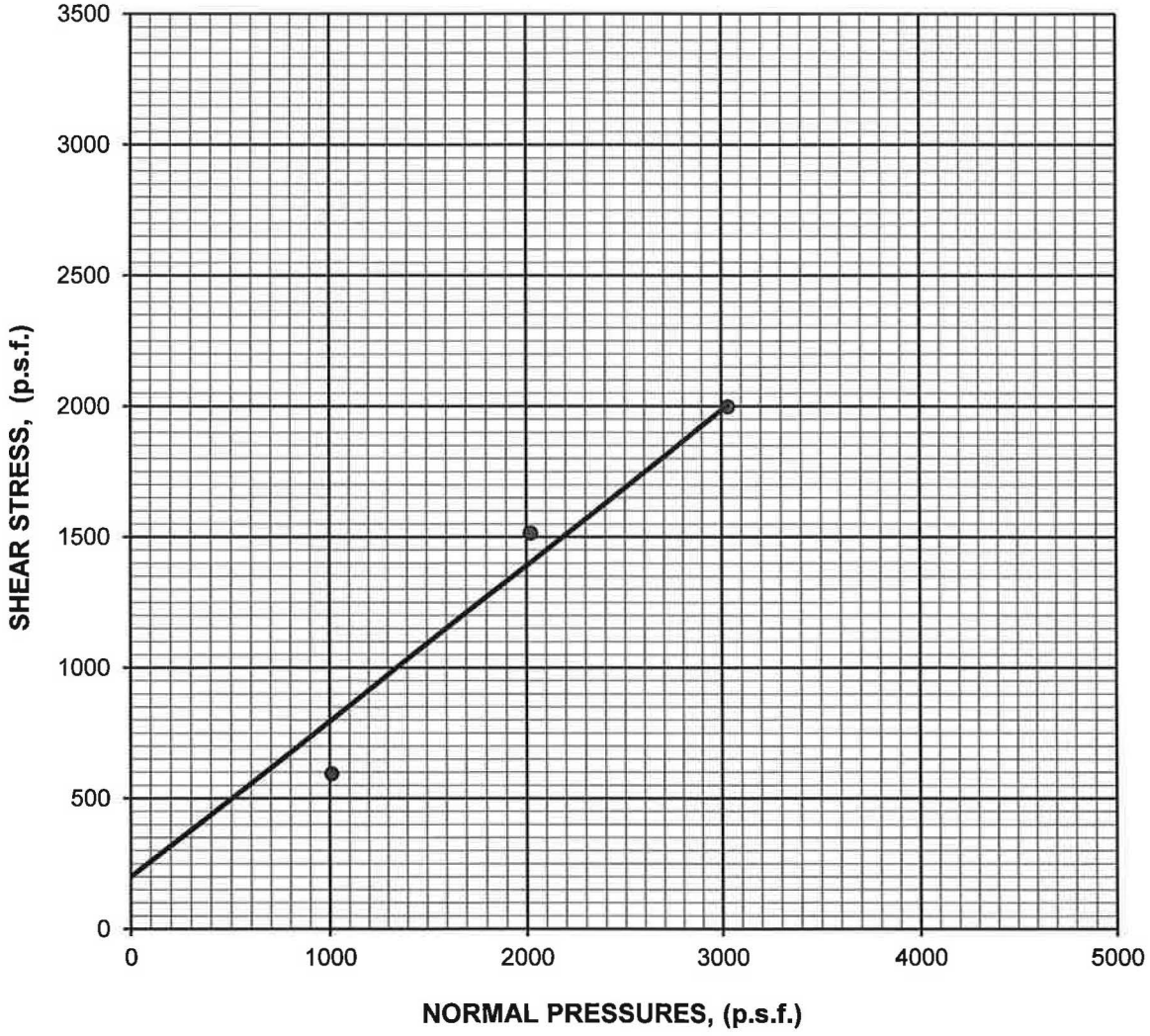
ASTM D 3080/D3080M-11

June, 2012

B-2 @ 1.5' - 2.0'
Lean CLAY with sand (CL)

INITIAL AVG DRY DENSITY: 101.0 pcf
INITIAL AVG MOISTURE CONTENT: 15.6 %
PEAK SHEAR ANGLE (Ø): 26°
COHESION (C): 300 psf

SHEAR STRESS vs. NORMAL PRESSURES



DIRECT SHEAR continued

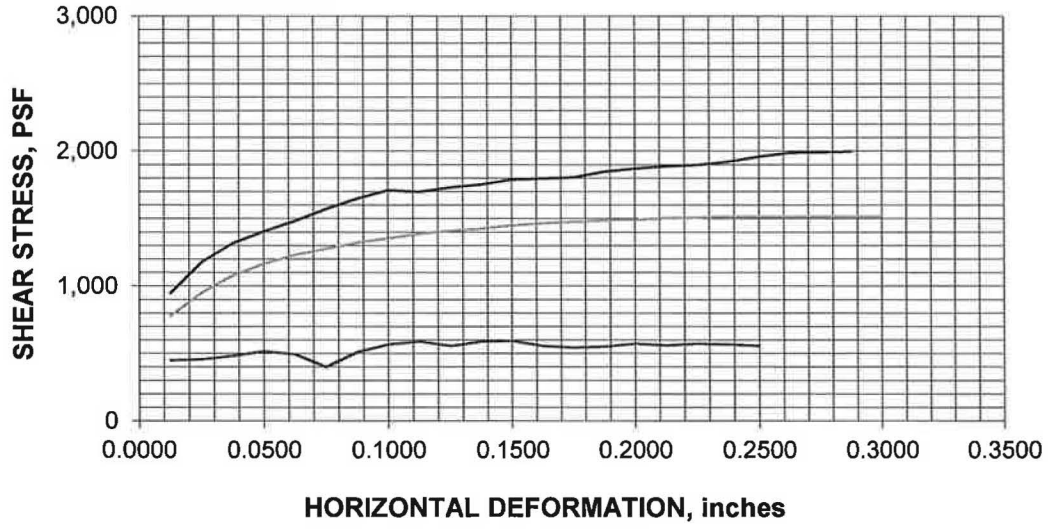
ASTM D 3080/D3080M-11

June, 2012

B-2 @ 1.5' - 2.0'
Lean CLAY with sand (CL)

0 SPECIFIC GRAVITY: 2.75 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	14.5	16.2	16.2	15.6
DRY DENSITY, pcf	101.8	100.1	101.1	101.0
SATURATION, %	58.2	62.4	64.0	61.5
VOID RATIO	0.686	0.714	0.697	0.699
DIAMETER, inches	2.37	2.37	2.37	
HEIGHT, inches	1.000	1.000	1.000	
AT TEST				
WATER CONTENT, %	21.9	23.5	23.3	22.9
DRY DENSITY, pcf	97.9	112.6	115.1	108.5
SATURATION, %	100.0	100.0	100.0	100.0
VOID RATIO	0.754	0.524	0.491	0.590
HEIGHT, inches	1.020	0.943	0.937	



Quail Vineyards Subdivision SH-11788-SA

DIRECT SHEAR

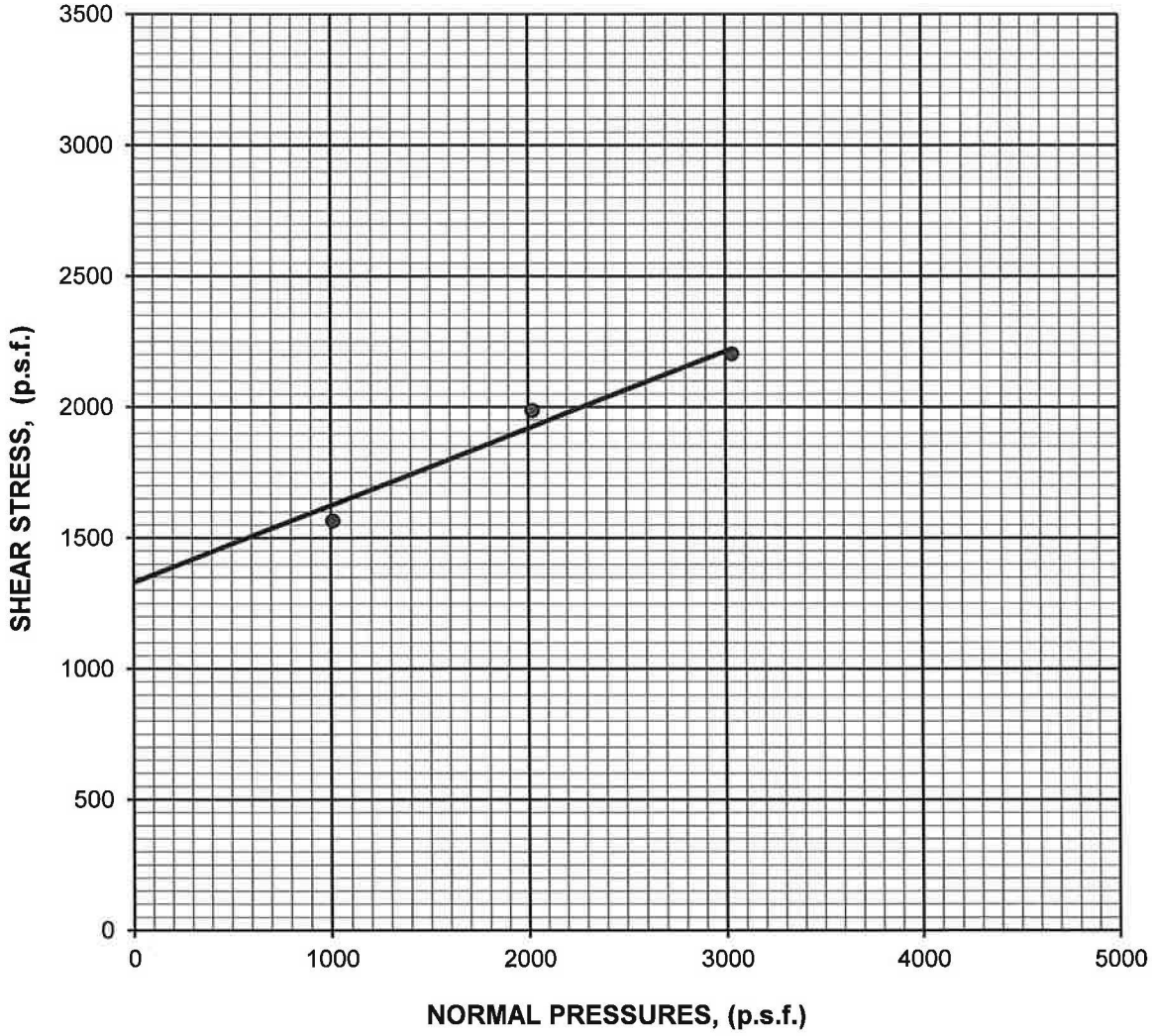
ASTM D 3080/D3080M-11

June, 2012

B-5 @ 4.5' - 5.0'
Lean CLAY with sand (CL)

INITIAL AVG DRY DENSITY: 110.2 pcf
INITIAL AVG MOISTURE CONTENT: 19.9 %
PEAK SHEAR ANGLE (Ø): 15°
COHESION (C): 1350 psf

SHEAR STRESS vs. NORMAL PRESSURES



DIRECT SHEAR continued

ASTM D 3080/D3080M-11

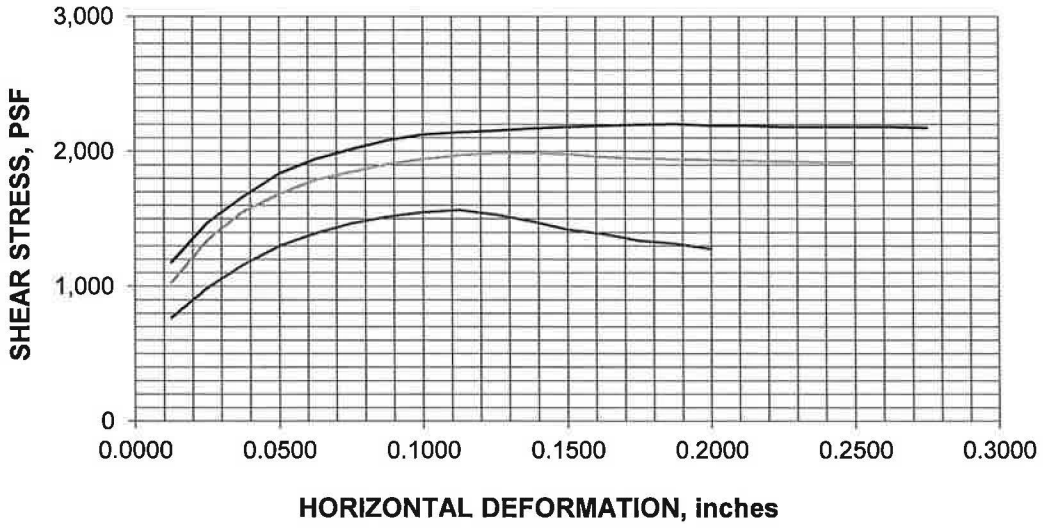
June, 2012

B-5 @ 4.5' - 5.0'

Lean CLAY with sand (CL)

0 SPECIFIC GRAVITY: 2.75 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	18.7	19.9	21.0	19.9
DRY DENSITY, pcf	111.7	109.9	109.1	110.2
SATURATION, %	95.8	97.4	100.0	98.0
VOID RATIO	0.537	0.562	0.572	0.557
DIAMETER, inches	2.37	2.37	2.37	
HEIGHT, inches	1.000	1.000	1.000	
AT TEST				
WATER CONTENT, %	20.8	22.0	23.4	22.1
DRY DENSITY, pcf	115.6	117.2	120.5	117.8
SATURATION, %	100.0	100.0	100.0	100.0
VOID RATIO	0.484	0.465	0.424	0.458
HEIGHT, inches	0.983	0.968	0.952	



APPENDIX C

Liquefaction Analysis

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B1 Data Set: 1

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 7.9 7.5
PGA, g: 0.57 0.65
MSF: 0.88
GWT: 8.0 feet
Calc GWT: 8.0 feet
Remediate to: 0.0 feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

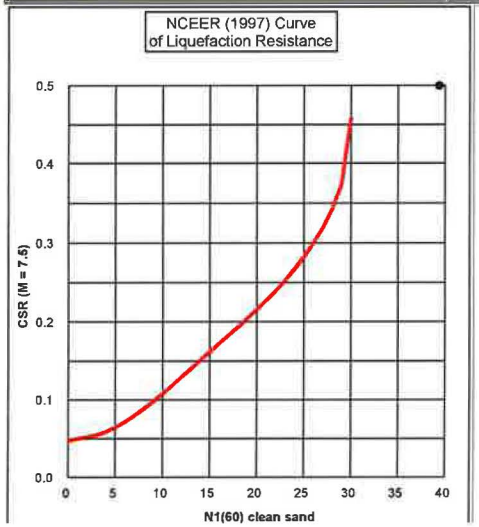
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.0 upper 50 ft

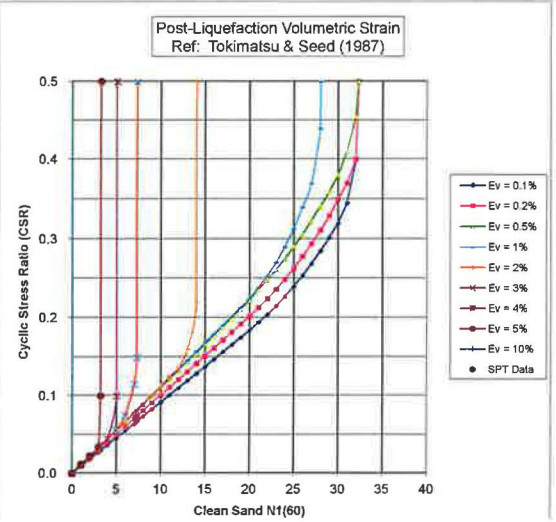
Required SF: 1.00
Threshold Acceler., g: 1.14 **Minimum Calculated SF:** 2.00

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																									
3.0	76	48		120	95	0.5	3.5	0.030	0.030	1.00	1.00	0.75	1.00	41.3				1.00	Infin.	0.423	Non-Liq.		41.3	0.00	0.00	0.020						
8.0	50	32		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	27.2				1.00	Infin.	0.419	Non-Liq.		27.2	0.00	0.00	0.201						
12.0	78	49		120	95	9.5	12.5	0.570	0.523	0.98	1.00	0.75	1.00	42.4				1.00	Infin.	0.452	Non-Liq.		42.4	0.00	0.00	0.382						
17.5	53	33	1	130	5	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	39.3	75	0.0	39.3	1.00	1.200	0.517	2.32	0.0	39.3	0.00	0.00	0.610	1,187	0.327	6.2E-04			
23.0		45	1	130	5	19.5	22.5	1.268	0.909	0.96	1.08	0.93	1.00	51.8	86	0.0	51.8	1.00	1.200	0.566	2.12	0.0	51.8	0.00	0.00	0.849	1,536	0.450	5.7E-04			
28.0		100	1	130	12	25.0	28.0	1.625	1.095	0.94	0.98	0.98	1.00	####	###	5.1	116.3	0.99	1.200	0.600	2.00	5.1	116.3	0.00	0.00	1.089	2,276	0.567	3.8E-04			





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))^0.5))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
$MSF = 10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
$G_{max} = 447*N_{1(60)cs}^{(1/3)}*p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)^(-0.16)
$\gamma = [1+a*EXP(b*\tau_{av}/G_{max})]/[(1+a)*\tau_{av}/G_{max}]$
$E_{15} = \gamma*(N_{1(60)cs}/20)^{-1.2}$
$E_{nc} = (Nc/15)^{0.45}*E15$

Nc = $(MAG-4)^{2.17}$
S = $2*H*E_{nc}$

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs} = N_{1(60)cs} + \Delta N_{1(60)}$
Kσ = min of 1.0 or $(p'o/1.058)^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
$Dr = (N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B2 Data Set: 2

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:
Magnitude: 7.9 7.5
PGA, g: 0.57 0.65
MSF: 0.88
GWT: 8.0 feet
Calc GWT: 8.0 feet
Remediate to: 0.0 feet

SPT N VALUE CORRECTIONS:
Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

Total (ft) Liquefied Thickness	Total (in.) Induced Subsidence
0	0.0

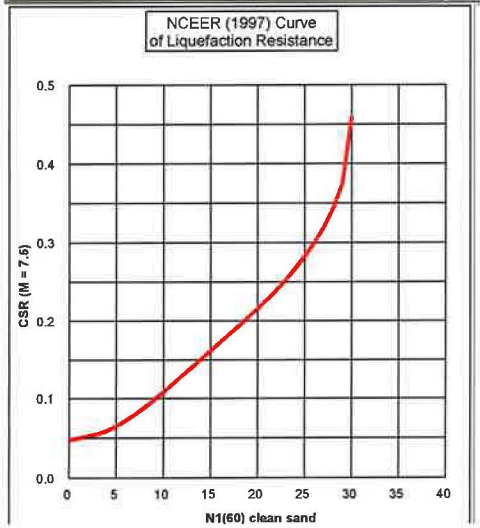
upper 50 ft

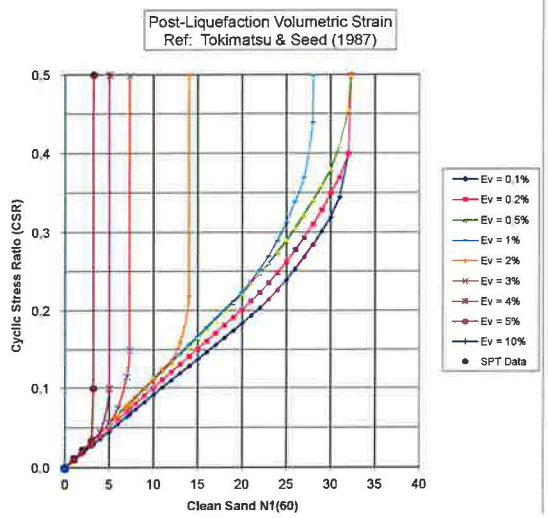
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Threshold Acceler., g: 1.31 **Required SF:** 1.00 **Minimum Calculated SF:** 2.29

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																									
2.5	34	21		120	95	2.0	5.0	0.120	0.120	1.00	1.00	0.75	1.00	18.5				1.00	Infin.	0.422	Non-Liq.		18.5	0.00	0.00	0.080						
7.5	35	22		130	95	5.0	8.0	0.325	0.325	0.99	1.00	0.75	1.00	19.0				1.00	Infin.	0.419	Non-Liq.		19.0	0.00	0.00	0.218						
8.0	53	33	1	130	10	7.7	10.7	0.501	0.501	0.98	1.45	0.75	1.00	41.9	77	1.8	43.6	1.00	1.200	0.417	Non-Liq.	1.8	43.6	0.04	0.00	0.335	911	0.182	4.6E-04	1.8E-04	2.0E-04	0.00
12.5	53	33	1	130	10	9.5	12.5	0.618	0.571	0.98	1.36	0.75	1.00	39.2	75	1.7	40.9	1.00	1.200	0.449	2.67	1.7	40.9	0.00	0.00	0.414	991	0.224	5.2E-04			
15.0	47	45	1	130	12	14.5	17.5	0.943	0.740	0.97	1.20	0.86	1.00	52.9	87	3.2	56.2	1.00	1.200	0.523	2.29	3.2	56.2	0.00	0.00	0.631	1,360	0.339	4.8E-04			
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)cs}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)cs}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.4}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs}$ = $N_{1(60)cs}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = $(N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B3 Data Set: 3

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 7.9 7.5
PGA, g: 0.57 0.65
MSF: 0.88
GWT: 8.0 feet
Calc GWT: 8.0 feet
Remediate to: 0.0 feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

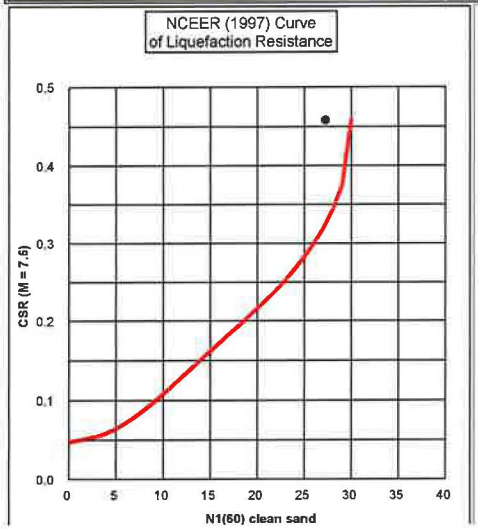
Total (ft) Liquefied Thickness	Total (in.) Induced Subsidence
4	0.7
	upper 50 ft

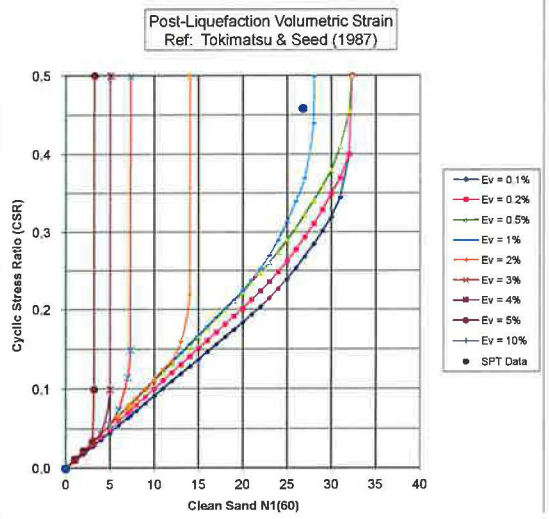
Required SF: 1.00
Threshold Acceler., g: 0.40 Minimum Calculated SF: 0.71

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
4.0	48	30		120	95	2.0	5.0	0.120	0.120	1.00	1.00	0.75	1.00	26.1				1.00	Infin.	0.422	Non-Liq.		26.1	0.00	0.00	0.080						
8.0	17	11	1	130	10	5.0	8.0	0.325	0.325	0.99	1.70	0.75	1.00	15.7	47	1.2	16.9	1.00	0.183	0.419	Non-Liq.	1.2	16.9	0.30	0.15	0.218	535	0.119	1.1E-03	1.4E-03	1.5E-03	0.15
12.0	35	22	1	130	10	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	25.8	61	1.4	27.2	1.00	0.324	0.459	0.71	1.0	26.8	1.09	0.52	0.436	887	0.236	7.7E-04			
16.0	100	63	1	130	10	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	74.2	###	2.5	76.7	1.00	1.200	0.517	2.32	2.5	76.7	0.00	0.00	0.610	1,483	0.327	3.8E-04			
20.0	70	45	1	130	10	18.0	21.0	1.170	0.858	0.96	1.11	0.91	1.00	52.2	86	2.0	54.2	1.00	1.200	0.555	2.16	2.0	54.2	0.00	0.00	0.784	1,498	0.417	5.3E-04			
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
$MSF = 10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
$G_{max} = 447*N_{1(60)CS}^{(1/3)}*p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.5)}$
$\gamma = [1+a*EXP(b*\tau_{av}/G_{max})]/[(1+a)*\tau_{av}/G_{max}]$
$E_{15} = \gamma*(N_{1(60)CS}/20)^{-1.2}$
$E_{nc} = (Nc/15)^{0.4b}*E15$

Nc = $(MAG-4)^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS} = N_{1(60)CS} + \Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
$Dr = (N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coyright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B4 Data Set: 4

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

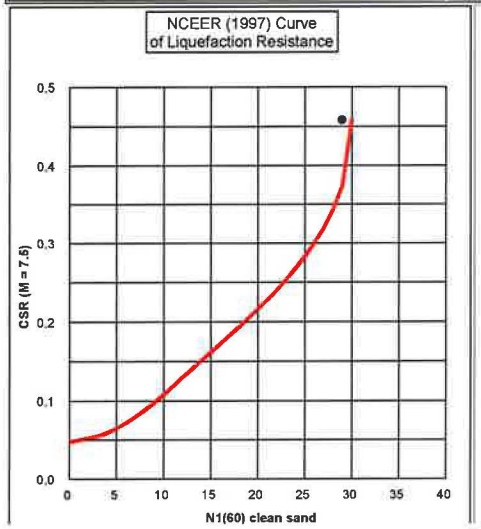
Total (ft) Liquefied Thickness: 4
Total (in.) Induced Subsidence: 0.5 upper 50 ft

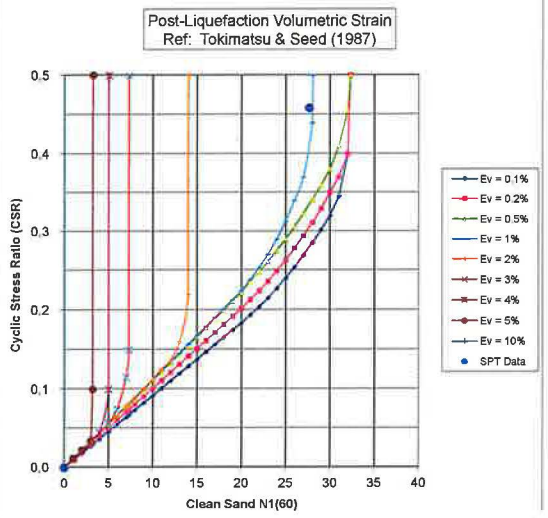
Required SF: 1.00
Threshold Acceler., g: 0.46 **Minimum Calculated SF:** 0.81

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)CS}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
3.0	28	18		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	15.2				1.00	Infin.	0.423	**Non-Liq.**		15.2	0.00	**0.00**	0.040						
8.0	19	12		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	10.3				1.00	Infin.	0.419	**Non-Liq.**		10.3	0.00	**0.00**	0.201						
12.0	36	23	1	130	12	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	26.5	62	2.4	28.9	1.00	0.371	0.459	**0.81**	1.1	27.6	1.03	**0.49**	0.436	905	0.236	7.3E-04			
15.0	60	38	1	130	5	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	44.5	80	0.0	44.5	1.00	1.200	0.517	**2.32**	0.0	44.5	0.00	**0.00**	0.610	1,237	0.327	5.6E-04			
		45					3.0			1.00		0.75	1.00	0.0										######								
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
C_N = (1 atm/p'o)$^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)CS}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)CS}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.45}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = ($N_{1(60)}$/70)$^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B5 Data Set: 5

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

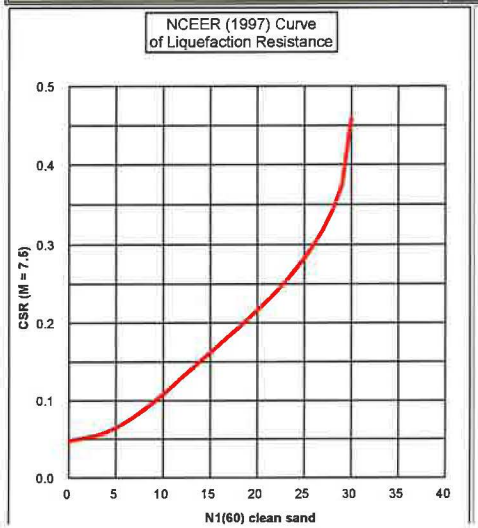
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.0 upper 50 ft

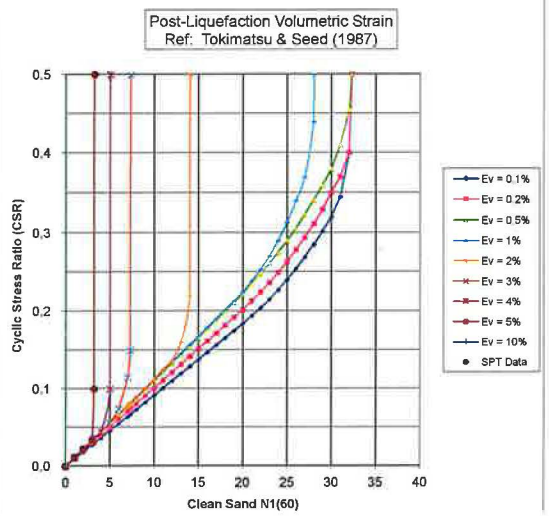
Threshold Acceler., g: 1.22
Required SF: 1.00
Minimum Calculated SF: 2.13

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
3.0	41	**26**		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	22.3				1.00	Infin.	0.423	**Non-Liq.**		22.3	0.00	**0.00**	0.040						
7.0	44	**28**		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	23.9				1.00	Infin.	0.419	**Non-Liq.**		23.9	0.00	**0.00**	0.201						
8.0	44	**28**	1	130	12	7.5	10.5	0.488	0.488	0.98	1.47	0.75	1.00	35.2	71	2.7	37.9	1.00	1.200	0.417	**Non-Liq.**	2.7	37.9	0.05	**0.01**	0.327	858	0.178	5.2E-04	2.4E-04	2.7E-04	**0.01**
12.0	60	**38**	1	130	12	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	44.2	79	2.9	47.1	1.00	1.200	0.459	**2.62**	2.9	47.1	0.00	**0.00**	0.436	1,066	0.236	4.8E-04			
17.0	60	**45**	1	130	12	15.0	18.0	0.975	0.757	0.97	1.18	0.86	1.00	52.9	87	3.2	56.1	1.00	1.200	0.528	**2.27**	3.2	56.1	0.00	**0.00**	0.653	1,383	0.350	4.9E-04			
20.0	54	**100**	1	130	30	19.0	22.0	1.235	0.892	0.96	1.09	0.92	1.00	####	###	10.0	125.4	1.00	1.200	0.562	**2.13**	10.0	125.4	0.00	**0.00**	0.827	2,035	0.439	3.2E-04			





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C_N = (1 atm/p'o)$^{0.5}$, max 1.7
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MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)CS}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)CS}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.45}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = ($N_{1(60)}$/70)$^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B6 Data Set: 6

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** **feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

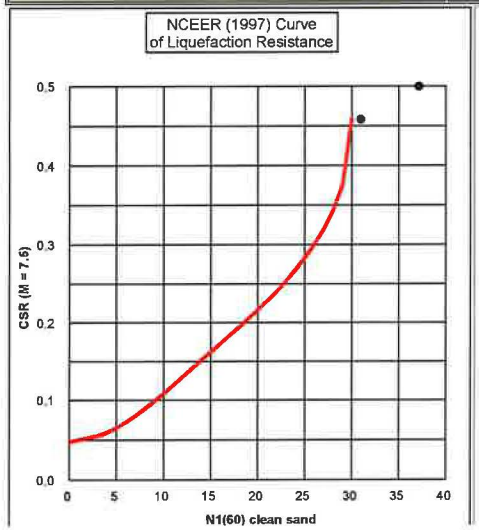
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.3 upper 50 ft

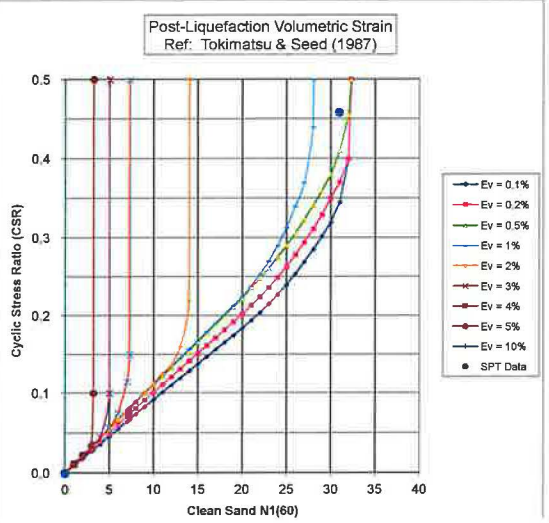
Required SF: 1.00
Threshold Acceler., g: 1.32 **Minimum Calculated SF:** 2.32

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	*Trigger FC Adj.* $\Delta N_{1(60)}$	*Equiv. Sand* $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	**Liquefac. Safety Factor**	*Post FC Adj.* $\Delta N_{1(60)}$	$N_{1(60)CS}$	Volumetric *Strain* (%)	**Induced Subsidence (in.)**	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	**Dry Sand Subsidence (in.)**
								0.000																								
4.5	69	**43**		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	37.5				1.00	Infin.	0.423	**Non-Liq.**		37.5	0.00	**0.00**	0.040						
8.0	31	**20**	1	120	40	5.0	8.0	0.300	0.300	0.99	1.70	0.75	1.00	28.6	64	10.0	38.6	1.00	1.200	0.419	**Non-Liq.**	10.0	38.6	0.04	**0.02**	0.201	677	0.110	4.3E-04	2.0E-04	2.2E-04	**0.02**
12.0	42	**26**	1	130	5	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	30.9	66	0.0	30.9	1.00	1.200	0.459	**2.62**	0.0	30.9	0.64	**0.31**	0.436	926	0.236	6.8E-04			
15.0	50	**32**	1	130	5	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	37.1	73	0.0	37.1	1.00	1.200	0.517	**2.32**	0.0	37.1	0.00	**0.00**	0.610	1,164	0.327	6.5E-04			
		45					3.0			1.00		0.75	1.00	0.0										######								
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
C_N = (1 atm/p'o)$^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)CS}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)CS}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.45}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = ($N_{1(60)}$/70)$^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B7 Data Set: 7

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

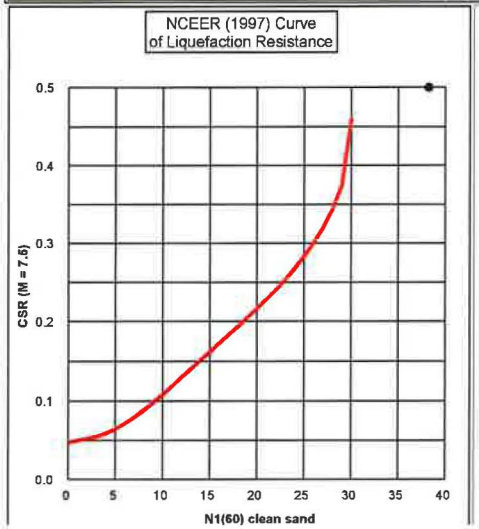
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.0 upper 50 ft

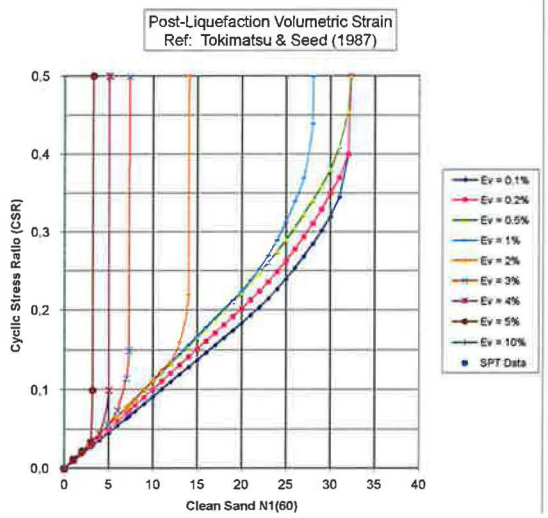
Required SF: 1.00
Threshold Acceler., g: 1.20 **Minimum Calculated SF:** 2.11

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
3.0	48	**30**		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	26.1				1.00	Infin.	0.423	**Non-Liq.**		26.1	0.00	**0.00**	0.040						
8.0	48	**30**		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	26.1				1.00	Infin.	0.419	**Non-Liq.**		26.1	0.00	**0.00**	0.201						
12.0	36	**23**		120	95	10.0	13.0	0.600	0.538	0.98	1.00	0.76	1.00	19.8				1.00	Infin.	0.463	**Non-Liq.**		19.8	0.00	**0.00**	0.402						
17.0	48	**30**	1	130	12	15.0	18.0	0.975	0.757	0.97	1.18	0.86	1.00	35.5	71	2.7	38.2	1.00	1.200	0.528	**2.27**	2.7	38.2	0.00	**0.00**	0.653	1,217	0.350	6.5E-04			
22.0		**45**	1	130	5	20.0	23.0	1.300	0.926	0.96	1.07	0.93	1.00	51.7	86	0.0	51.7	1.00	1.200	0.569	**2.11**	0.0	51.7	0.00	**0.00**	0.871	1,554	0.461	5.7E-04			
25.0		**100**		130	95	24.0	27.0	1.560	1.061	0.95	1.00	0.97	1.00	####				1.00	Infin.	0.589	**Non-Liq.**		112.1	0.00	**0.00**	1.045						





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C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
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C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)cs}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*$(p/1)^{(-0.5)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*$(N_{1(60)cs}/20)^{-1.2}$
E_{nc} = $(Nc/15)^{0.45}$*E15

Nc = $(MAG-4)^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs}$ = $N_{1(60)cs}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or $(p'o/1.058)^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = $(N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

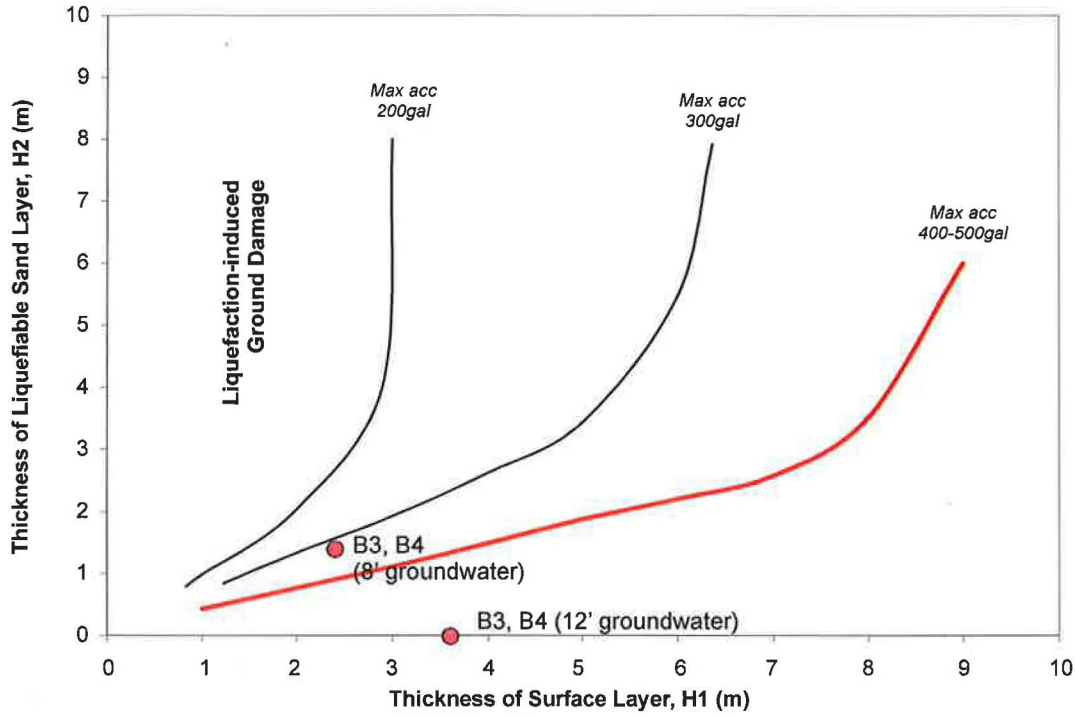


Figure A. Boundary Curve for Discriminating Between Occurrence and Nonoccurrence of Surface Effects of Liquefaction.
Base: Youd & Garris, 1995

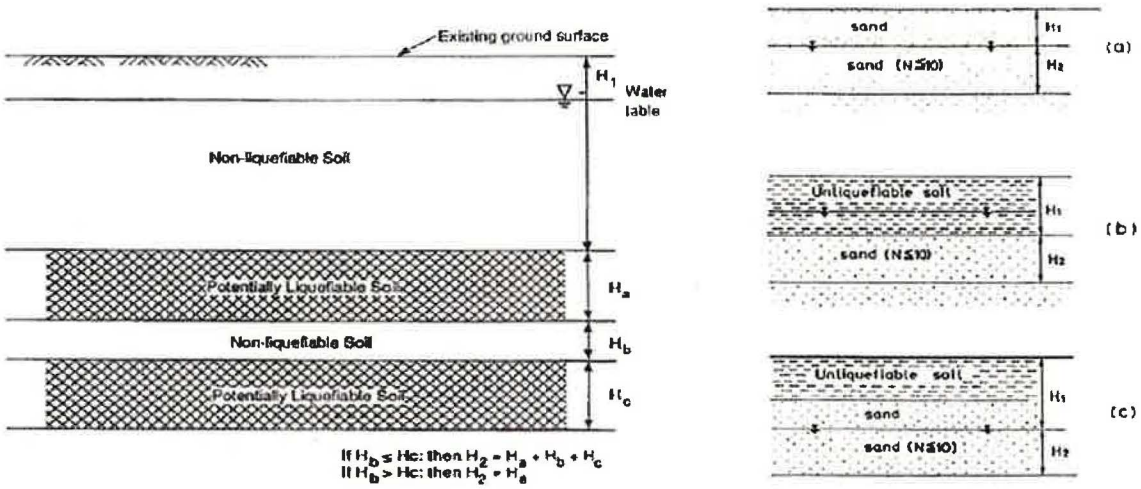


Figure B. Schematic Diagram for Determination of H1 and H2 Used in Figure B (After Ishihara, 1985)
Base: Martin and Lew, 1999

CORNERSTONE EARTH GROUP

Date:	March 16, 2023
Project No.:	1370-2-1
Prepared For:	Mr. William Rocke Garcia **BLACKROCK LLC** 2730 Lone Oak Court Gilroy, California 95020
Re:	Field Infiltration Testing Results Quail Vineyards Watsonville Road and Santa Teresa Boulevard Morgan Hill, California

Dear Mr. Garcia:

As requested, this letter presents infiltration test results and recommendations for the planned stormwater infiltration system for the above referenced project. The location of the site is shown on the Vicinity Map, Figure 1. Our services were performed in accordance with our agreement dated February 27, 2023.

For our use, we were provided a preliminary grading plan packet titled "Quail Vineyards, Morgan Hill, California, Sheet 3, and Sheet 4," prepared by MH Engineering Company, dated November 1, 2022 with markup indicating desired test locations. In addition, we coordinated test locations, depths, and testing method with you based on the provided grading plans.

PROJECT SUMMARY

The project includes redeveloping the approximately 17½-acre site for single-family residential units. Approximately 14 total residential units and an extension of Secretariat Way are planned. At this time, the location of infiltration and detention basins are unknown.

IN-SITU WATER INFILTRATION

To estimate the in-situ infiltration rate of the soils at locations and depths provided and discussed with you, we performed a total of four in-situ field infiltration tests using a Guelph permeameter device (I-1 through I-4) and two in-situ field infiltration tests using a Double-Ring Infiltrometer (D-1 and D-2) on March 8, 2023. The approximate locations of the field infiltration tests (I-1 through I-4, D-1, and D-2) are shown on the attached Site Plan, Figure 2.

Guelph Permeameter Tests

To estimate the infiltration rate of the soils, we performed four in-situ field permeability tests using a Guelph Permeameter by SoilMoisture Equipment Corp., Model #2800, in general accordance with ASTM D5126. Generally, the Guelph permeameter is a constant head device which uses two water-filled chambers to measure infiltration rate in a shallow borehole. A

constant head level is established in the borehole and the rate of water outflow into the surrounding soil is noted. The rate of flow when it reaches a steady state, or constant rate, is used to determine an approximate infiltration rate for that location and depth.

The infiltration tests were performed at an approximate depth of 3 and 5 feet below existing site grades. The test results are summarized in Table 1.

Table 1: In-Situ Field Guelph Permeameter Test Results

Location	Depth Below Existing Grade (ft)	3-D Infiltration Rate		Material at Test Depth
		(in/hr)	(cm/min)	
I-1	3.0	3.45	0.15	Sandy Lean Clay (CL) / Clayey Sand with Gravel (SC)
I-2	3.0	0.18	0.01	Lean Clay with Sand (CL)
I-3	5.0	5.59	0.24	Sandy Lean Clay (CL)
I-4	3.0	0.00	0.00	Lean Clay (CL)

Following completion of the infiltration tests, we hand augered beneath the test depths about ½ to 2 feet beneath the bottom of test to observe the soil conditions beneath the test depth. At I-1, generally sandy lean clays with some fine gravels were encountered to a depth of about 3 feet underlain by clayey sand with gravel to a depth of 3½ feet, the depth of hand auger refusal. At I-2, lean clay with sand was encountered to the maximum depth explored of 5 feet. At I-3, sandy lean clay with some fine gravels was encountered to the maximum depth of 5½ feet. Some roots were also observed within the test hole. At I-4, lean clay was encountered to the maximum depth explored of 5 feet. Boring logs I-1 to I-4 are attached to this letter.

Double-Ring Infiltration Test (DRIT)

We also performed two in-situ field infiltration tests using a double-ring infiltrometer in accordance with ASTM D335 test methods (constant head) at a depth of approximately 3 feet below existing site grades. A mini excavator and hand digging equipment were used to cut approximately 5 x 5 x 3-foot (L x W x H) test pits to perform the infiltration tests. The rings were embedded at least 6 inches below the exposed soil level, filled with approximately 2 to 12 inches of water and allowed to presoak for at least 30 minutes before starting the test readings. Infiltration test D-1 was conducted for approximately 35 minutes while D-2 was conducted for approximately 1 hour and 30 minutes, until a constant infiltration rate was established. The test results are summarized in the following table.

Table 2: Field Test Results

Test Location	Depth Below Existing Grade (ft)	Estimated Stead State Infiltration Rate (in/hr)	Material at Test Depth
D-1	3.0	40.0	Clayey Sand with Gravel (SC)
D-2	3.0	0.0	Lean Clay (CL)

**Note minimal fines were encountered at the D-1 location beneath the test depth. The actual long term infiltration rate may be lower than the test result.*

After infiltration test D-1 was conducted, the test pit was excavated to a depth of 5 feet to observe the soil conditions beneath the test depth. At a depth of about 3¼ feet, clayey gravel

with sand was encountered to the maximum test pit depth of 5 feet. The test pits were loosely backfilled after performing the infiltration tests. Subsurface logs of the two test pits are shown in Figures 3 and 4.

Reliability of Field Test Data

Test results may not be truly indicative of the long-term, in-situ infiltration. Other factors including stratifications, heterogeneous deposits, overburden stress, disturbance, organic content, depth to groundwater, and other factors can influence test results. In addition, for stratified soils such as those encountered at the site, the average horizontal infiltration is typically greater than the average vertical infiltration.

Findings and Recommendations

Based on our findings, the soil at the locations tested and at depths of about 3 and 5 feet below existing grade have infiltration rates of approximately 0 to 40 inches per hour. Based on our test results, the in-situ field tests indicated a variable infiltration rate ranging from impermeable to high infiltration at the depths and locations tested. Based on our observations, the subsurface soils in the upper 5 feet are highly variable.

The project civil engineer should review the above information and provide additional recommendations as deemed necessary.

General Comments and Design Considerations

As discussed, the tests were performed at discrete locations and depths. In addition, some disturbance can occur in preparing the test. Therefore, the above results can vary significantly and may not be representative over the entire site. Localized areas/depths with higher or lower permeable materials can increase or decrease the actual infiltration rates. Therefore, we recommend the potential for variations be considered when evaluating the soil infiltration capacity or performance.

CLOSURE

We hope this provides the information you need at this time. Recommendations presented in this letter have been prepared for the sole use of Blackrock LLC specifically for the Quail Vineyards project at Watsonville Road and Santa Teresa Boulevard in Morgan Hill, California. Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices at this time and location. No warranties are either expressed or implied.

If you have any questions or need any additional information from us, please call and we will be glad to discuss them with you.

Sincerely,

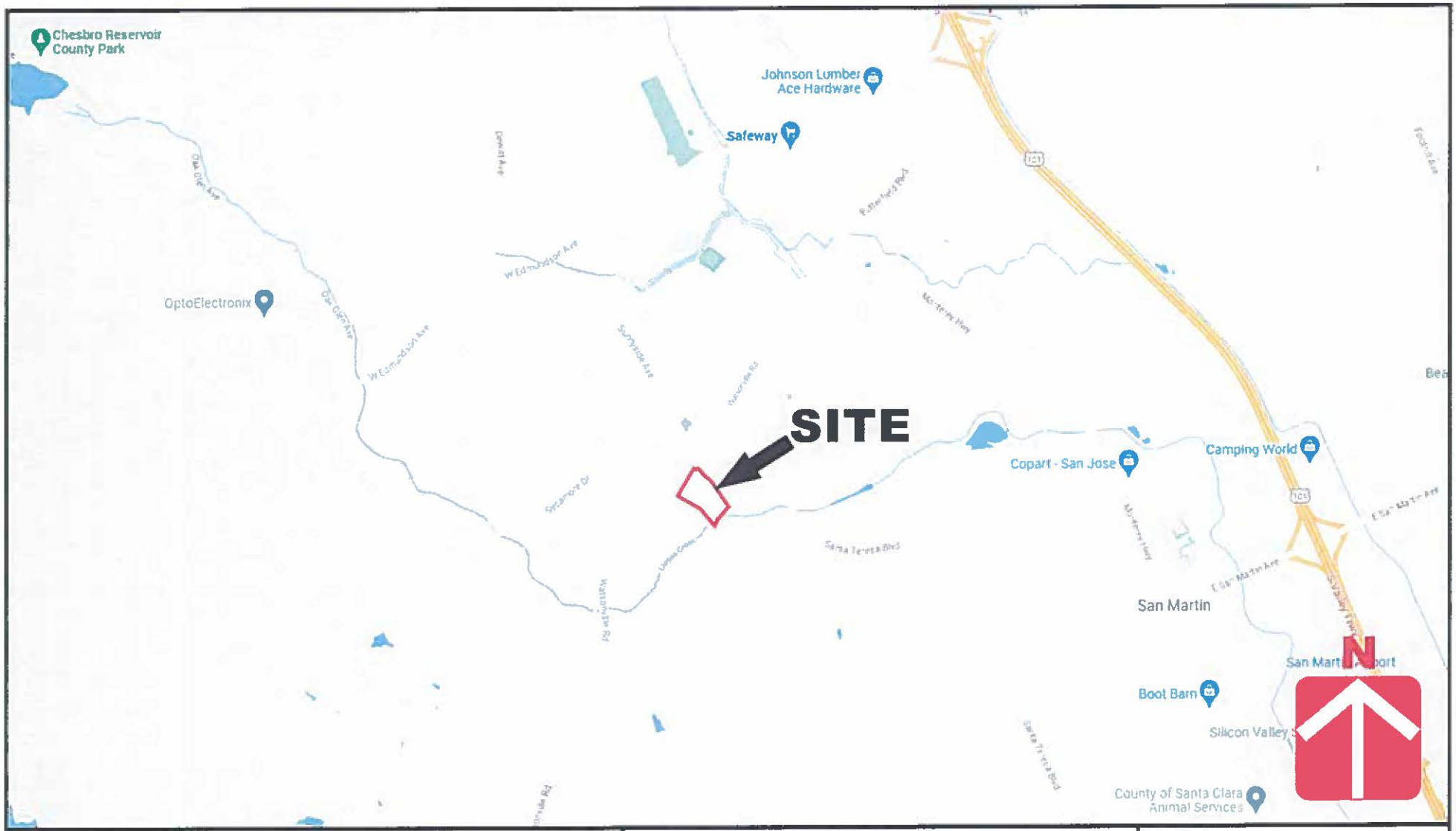
CORNERSTONE EARTH GROUP, INC.

Matthew J Schaffer, P.E., G.E.
Principal Engineer

MJS:ea

Attachments: Figure 1: Vicinity Plan
Figure 2: Site Plan
Figure 3: D-1 Subsurface Log
Figure 4: D-2 Subsurface Log
Boring Logs I-1 and I-4

Copies: Addressee (PDF by email)

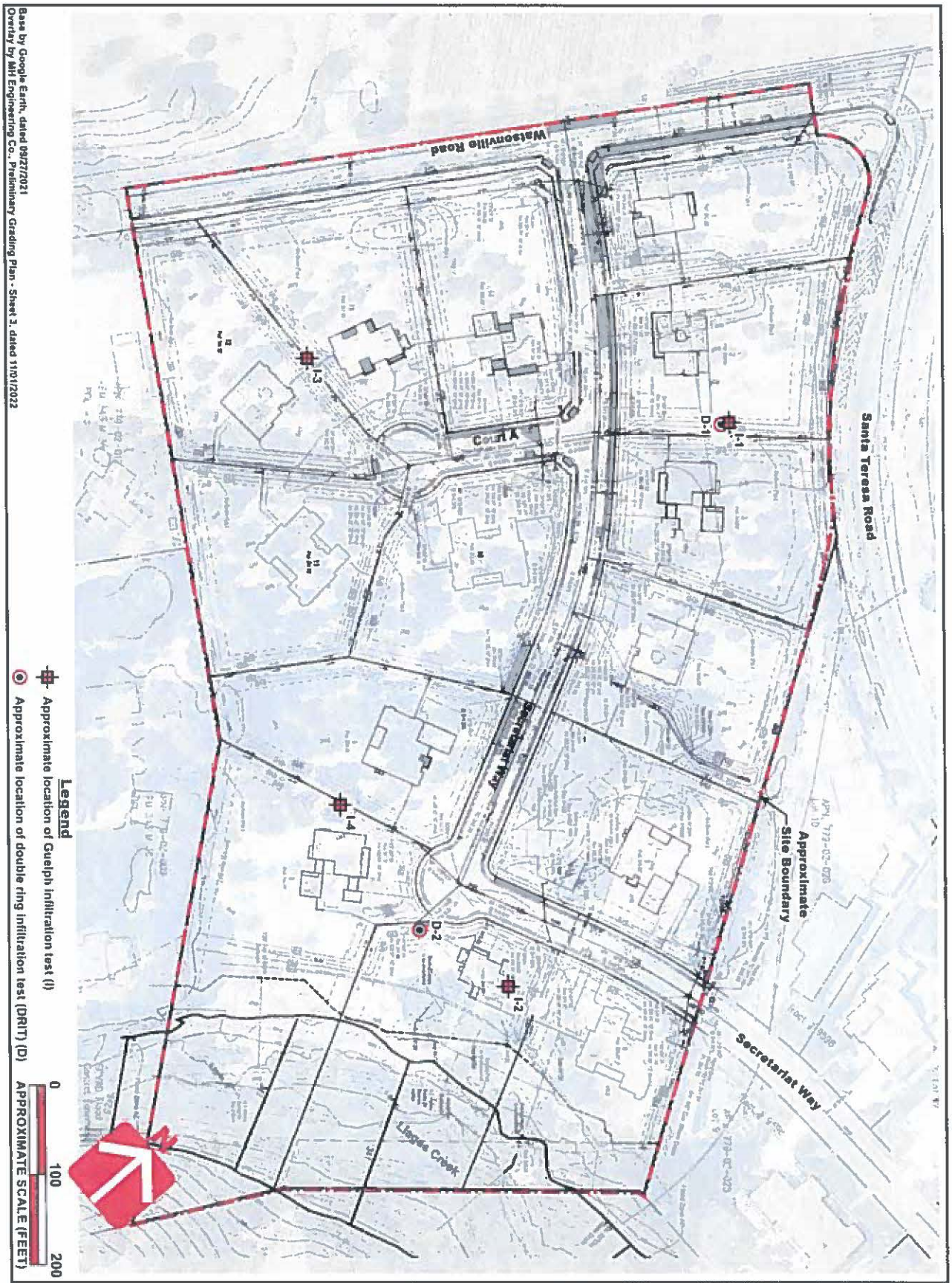


CORNERSTONE EARTH GROUP

Vicinity Map

Quail Vineyards
Morgan Hill, CA

Project Number	1370-2-1
Figure Number	Figure 1
Date	March 2023
Drawn By	RRN



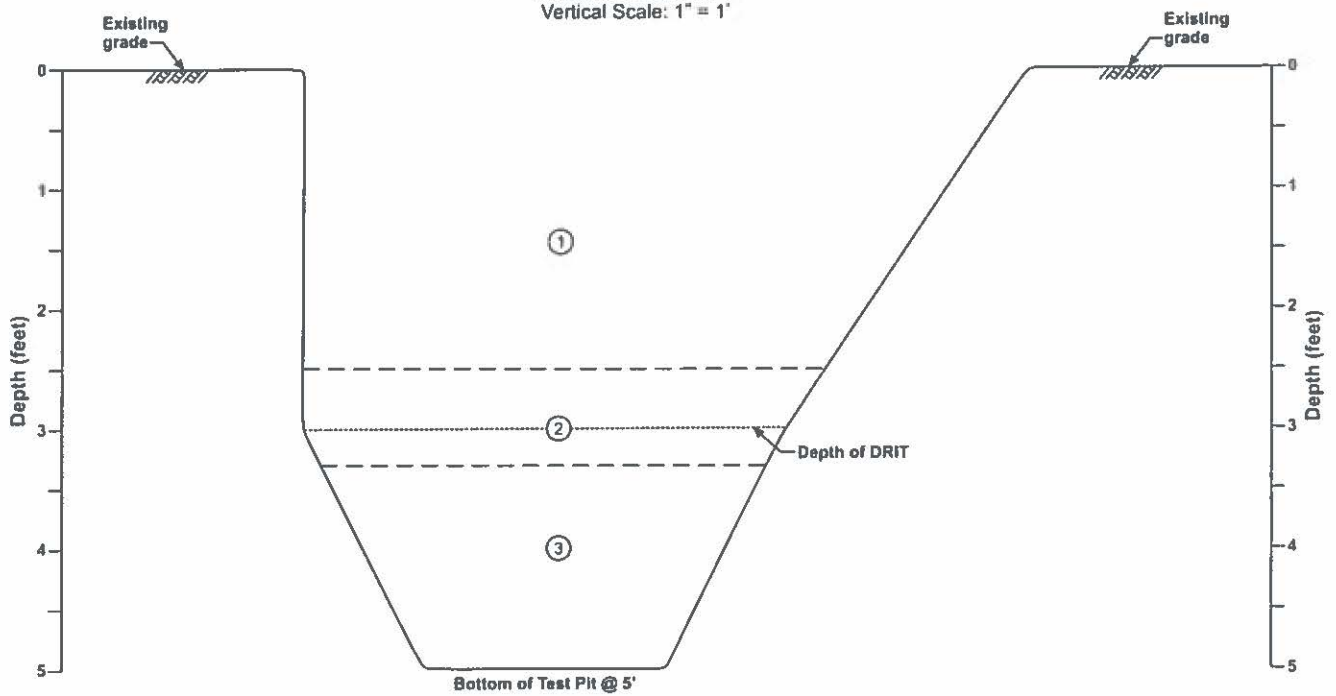
Base by Google Earth, dated 09/27/2021
Overlay by MH Engineering Co., Preliminary Grading Plan - Sheet 3, dated 11/01/2022

CORNERSTONE EARTH GROUP

Site Plan	Project Number: 1370-2-1
Quail Vineyards Morgan Hill, CA	Figure Number: Figure 2
	Date: March 2023 — Drawn By: RRN

D-1 Subsurface Log

Horizontal Scale: NTS
Vertical Scale: 1" = 1'



UNIT DESCRIPTONS

① **Sandy Lean Clay (CL):**
moist, brown to dark brown mottled, fine to coarse sand, some fine subangular gravel, moderate plasticity

② **Clayey Sand with Gravel (SC):**
moist, dark brown, fine to coarse sand, fine to coarse subrounded gravel

③ **Clayey Gravel with Sand (GC):**
moist, brown, fine to coarse sand, fine to coarse subrounded gravel, some cobbles

Note
DRIT performed at depth of 3 feet prior to continuing subsurface excavation to 5 feet

Project Number	1370-2-1
Figure Number	Figure 3
Date	March 2023
Logged By	JDS
Drawn By	RRN

D-1 Subsurface Log

Quail Vineyards
Morgan Hill, CA

CORNERSTONE EARTH GROUP

D-2 Subsurface Log

Horizontal Scale: NTS
Vertical Scale: 1" = 1'

UNIT DESCRIPTONS

① Lean Clay (CL): moist, dark brown to brown, some fine sand, moderate plasticity

CORNERSTONE EARTH GROUP	D-2 Subsurface Log Quail Vineyards Morgan Hill, CA	Project Number: 1370-2-1 Figure Number: Figure 4 Date: March 2023 | Logged By: JDS | Drawn By: RRN

BORING NUMBER I-1

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA
DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 3.5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. The description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL) 1.0 2.0 3.0 4.0
	0.0		**Sandy Lean Clay (CL)** moist, brown and dark brown mottled, fine to coarse sand, some fine subangular gravel, moderate plasticity		GB					
	2.5		**Clayey Sand with Gravel (SC)** moist, dark brown to brown, fine to coarse sand, fine to coarse subangular to subrounded gravel Practical refusal of hand auger in gravels or cobbles Bottom of Boring at 3.5 feet.		GB GB					
	5.0									
	7.5									
	10.0									

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/14/23 14:22 - P:\DRAFTING\GINT FILES\1370-2-1 QUAIL VINEYARDS.GPJ

BORING NUMBER I-2

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA
DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL) 1.0 2.0 3.0 4.0
	0.0		**Lean Clay with Sand (CL)** moist, dark brown to brown, fine to medium sand, moderate plasticity		GB					
	2.5				GB					
	5.0		Bottom of Boring at 5.0 feet.							
	7.5									
	10.0									

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/14/23 14:22 - P:\DRAFTING\GINT FILES\1370-2-1 QUAIL VINEYARDS.GPJ

BORING NUMBER I-3

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA
DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 5.5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0.0		**Sandy Lean Clay (CL)** moist, dark brown to brown, fine to medium sand, moderate plasticity		GB					
	2.5		some fine subangular to subrounded gravel, some roots		GB GB GB GB					
	5.0		Bottom of Boring at 5.5 feet.							
	7.5									
	10.0									

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/14/23 14:22 - P:\DRAFTING\GINT FILES\1370-2-1 QUAIL VINEYARDS.GPJ

BORING NUMBER I-4

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA

DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL) 1.0 2.0 3.0 4.0
	0.0		**Lean Clay (CL)** moist, dark brown to brown, some fine to medium sand, moderate plasticity		GB					
	2.5				GB					
					GB					
	5.0		Bottom of Boring at 5.0 feet.							
	7.5									
	10.0									

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/14/23 14:22 - P:\DRAFTING\GINT FILES\1370-2-1 QUAIL VINEYARDS.GPJ

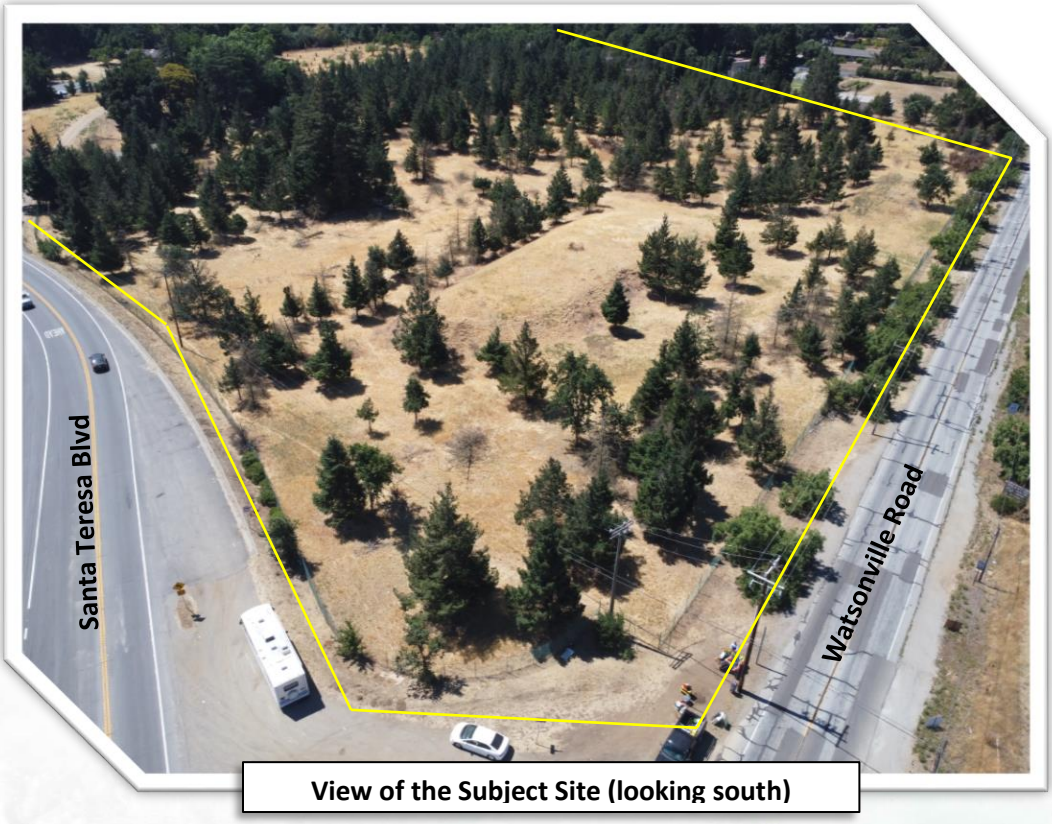
Appendix F

Phase I/II Environmental Site Assessment

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

Phase I Environmental Site Assessment

August 28, 2023



View of the Subject Site (looking south)

Subject Site:

14905 Santa Teresa Boulevard
Morgan Hill, California

Santa Clara County
Assessor Parcel Numbers:
779-02-023

PROJECT: 2T325

Prepared for:

Blackrock, LLC
c/o: Doug Blackwell
2730 Lone Oak Court
Gilroy, CA 95020

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Appendix C: *EDR Radius Report (database review of regulated sites)*
Appendix D: *Local Agency Records: Related Reports, Closure Letters, & Regulatory Correspondence*

Abbreviations and Acronyms

APN	*Assessor's Parcel Number*	NFA	*No Further Action (de minimis Condition)*
ASTM	*American Society for Testing & Materials*	ppm	*Parts Per Million*
bgs	*Below Ground Surface*	NPL	*USEPA National Priorities List of Superfund*
CERCLIS	*Comprehensive Environmental Response, Compensation, and Liability Information System*	ppb	*Parts Per Billion*
CERC-NFRAP	*CERCLIS – No Further Remedial Action Required*	REC	*Recognized Environmental Condition*
CHMIRS	*California Hazardous Material Incident Report System*	SCVWD	*Santa Clara Valley Water District*
CREC	*Controlled Recognized Environmental Condition*	SLIC	*Spills, Leaks, Investigation & Clean-up*
CUPA	*Certified Unified Program Agency (A Local Haz-Mat Regulatory Oversight Agency)*	TPH	*Total Petroleum Hydrocarbons*
EDR	*Environmental Data Resources*	µg/L	*Micrograms per Liter*
ESA	*Environmental Site Assessment*	USGS	*United States Geological Society*
ESL	*Environmental Screening Level*	UST	*Underground Storage Tank*
ft^2	*Square Foot*		
HMBP	*Hazardous Materials Business Plan*	VCA	*Voluntary Cleanup Agreement*
HREC	*Historical Recognized Environmental Condition*	VCP	*Voluntary Cleanup Program*
LUST	*Leaking Underground Storage Tank*	VEC	*Vapor Encroachment Condition*
LTCP	*Low Threat Closure Policy*	VOC	*Volatile Organic Compound*
mg/Kg	*Milligrams per kilogram*		

Explanation of Phase I Environmental Site Assessment Terminology
(source: ASTM Standard E 1527-21)

'REC' - *Recognized Environmental Condition*: (1) the presence of hazardous substances or petroleum products in, on, or at the *subject* property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the *subject* property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the *subject* property under conditions that pose a material threat of a future release to the environment.

'CREC' – *Controlled Recognized Environmental Condition*: *recognized environmental condition* affecting the *subject* property that has been addressed to the satisfaction of the applicable regulatory authority or authorities with *hazardous substances or petroleum products* allowed to remain in place *subject* to implementation of required controls (for example, *activity and use limitations or other property use limitations*).

'HREC' - *Historical Recognized Environmental Condition*: a previous release of *hazardous substances or petroleum products* affecting the *subject* property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the *subject* property to any controls (for example, *activity and use limitations or other property use limitations*). A *historical recognized environmental condition* is not a recognized environmental condition.

***De minimis Condition*:** a condition related to a release that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. A condition determined to be a *de minimis condition* is not a *recognized environmental condition* nor a *controlled recognized environmental condition*.

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

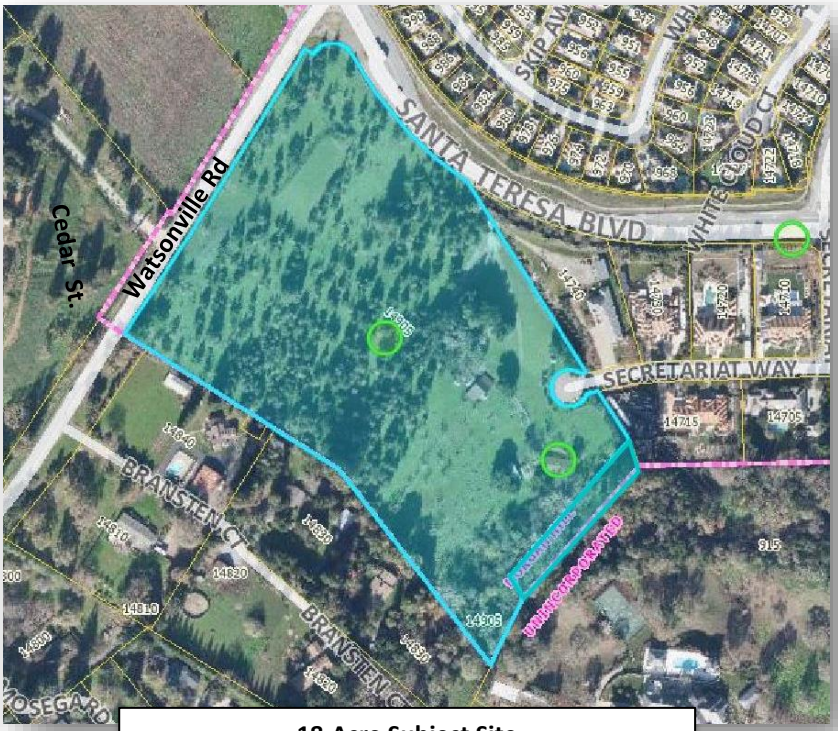
1.0 EXECUTIVE SUMMARY

This report contains results of a *Phase I Environmental Site Assessment (ESA)*, which was conducted to evaluate the potential presence of environmental liabilities for an approximate 18-acre, two parcel agricultural property located at 14905 Santa Teresa Boulevard in Morgan Hill (herein referred to as the subject "Site", see the *Topographic Location Map*, Figure 1). It is our understanding that this assessment is being conducted for a potential property sale.

This *Phase I ESA* report documents standard investigation steps that include historical land use research, a review of regulatory records pertaining to on-site and vicinity properties, Site reconnaissance, and interviews with persons knowledgeable about the Site. A synopsis of this research and fieldwork is presented in this *Executive Summary*.

1.1 Summary of the Physical Setting

The subject Site is a flat-lying, approximately 18-acre, two parcel agricultural property located in a mixed residential and agricultural area of Morgan Hill (see Section 3.0 for full details). The Site contains several structures that are clustered in the eastern portion of the property including a single-family residence and detached garage, a historic barn, and a construction trailer. The remaining acreage of the relatively flat-lying property contains a mixture of relic trees from previous farming operations (Christmas and walnut trees) and grasses. (see aerial clip to right and photos in Appendix A).



18-Acre Subject Site
(boundaries highlighted in blue)

Historical aerial photographs show the Site has remained an agricultural property since at least 1939 (copies of the historical aerials are included in Appendix B). The Site is bound by Santa Teresa Blvd and residential neighborhoods to the northeast, Watsonville Road and mixed agricultural/residential to the northwest, and rural residential to the southwest, south, and southeast. Eastward flowing Llagas Creek boarders the southeast property boundary (see the *Aerial Vicinity Map*, Figure 2). Previous on-site gauging of first encountered groundwater beneath the Site documented a seasonal fluctuation of depths 12-to-18 feet below ground surface (bgs) and a northeasterly flow direction.

1.2 Summary of Phase I Research

Phase I ESAs provide limited assurances of risk, since they rely on current Site conditions (i.e., a Site inspection), cooperative and candid interviews/questionnaires, and a limited database of regulatory and historical documentation. The Site inspections, interviews, and review of regulatory and historic documents are designed to identify real and potential environmental liabilities of concern. Potential liabilities have been categorized by the *American Society for Testing and Materials (ASTM)* into the following four conditions based on decreasing levels environmental risk:

1) *recognized environmental conditions (REC)*,
2) *controlled recognized environmental conditions (CREC),*
3) *historical recognized environmental conditions (HREC),* and
4) *de minimis conditions.*

Definitions of these terms are provided in the front of this report (see *Explanation of Environmental Assessment Terminology*).

1.2.1 Summary of On-Site Findings

Phase I *Historical Document Review* (details in Section 4.0): Historical aerial photographs combined with reverse telephone directories indicates that the subject Site was continuously used for agricultural purposes for over 80 years (the 1939 aerial shows cultivated lands). Orchard and row crop cultivation operations appear to slow or cease in the mid 1990's.

Prior to 1980, adjoining and vicinity land-use was predominantly agricultural. There was a significant land use transition to residential in the vicinity of the Site after 1980 coinciding with the growth of Morgan Hill (copies of historical aerials included in Appendix B).

Phase I *Review of Agency Records* (details in Section 5.0): Agency records of the subject site document the discovery and removal of an abandoned, 1,000 gallon, underground storage tank (UST). The UST was removed in May 1997 and a limited volume of impacted soils was removed to a depth of shallow groundwater, which was encountered at a depth of 14 feet below ground surface (bgs). Subsequent delineation investigations and two (2) years of groundwater monitoring confirmed the gasoline release was very limited and attenuating over time. An old domestic well was properly destroyed as part of case closure activities. The characterization and cleanup of the fuel release was completed to the satisfaction of overseeing agency, and staff issued a "*No Further Action*", case closure letter in 2001. The record of this agency-closed, fuel release case is considered a ***historical recognized environmental condition*** **(HREC)**.

> <u>*Non-Agency Required, Property Transaction Property Screening Assessment*</u>: In 2013, a Phase I ESA, and *Phase II Limited Soil, Soil Vapor and Groundwater Sampling Investigation* were completed to evaluate *potential* environmental liabilities that may have resulted from long term agricultural operations at the property. Testing targeted: a) a follow-up check of the agency-closed, former UST release, and b) a screening of shallow soil to check for the presence of persistent pesticides. Laboratory test results confirmed no significant impacts from either the former fuel release location or the agricultural fields. The sampling included testing for asbestos and lead around the perimeter of site structures to evaluate potential impacts from building

materials. No asbestos was detected but some very limited lead impacts were detected in shallow soils around the perimeter of the buildings (typical residue of lead-based paint chipping). Overall, the results showed that there were no significant environmental impacts discovered on Site base as a result of historical/current land uses (Appendix D includes text, summary tables and figures from this report).

Phase I *User Questionnaire* (details in Section 6.0): No additional environmental conditions of concern were revealed for the Site and vicinity properties from the review of agency records or from the *User Questionnaire*.

Phase I *Site Inspection* (details in Section 7.0): The *Phase I ESA* includes an inspection of current environmental conditions at the Site. The inspection showed the agricultural property to be largely vacant with site improvements in the eastern portion of the site and the remainder containing clusters of vegetation (i.e., overgrown Christmas trees, walnut trees, and other wild shrubs and grasses). The single-family home appeared well maintained and was occupied by a tenant. The barn appeared to be in relatively poor condition but safe enough to house a few sheep. The sheep are used to control the grasses and shrubs across the vacated (not actively managed) ag-fields. No containers of bulk chemical were observed during the inspection.

There are two (2) water supply wells on the property. A 5-inch diameter well installed in 1998 provides drinking water to the residence (a copy of the drillers well log is included in Appendix D). The second, is an inactive, cistern-type, water supply well located along the Llagas Creek drainage behind the residence (see the *Aerial Site Map,* Figure 3). Inactive and abandoned wells are required to be properly destroyed under a permit issued by the Santa Clara Valley Water District (SCVWD). The property owner has reported that SCVWD is aware of this inactive cistern-type water supply well and there are plans in place for the proper well destruction and as such, it is not considered a *recognized environmental condition*.

Inactive, cistern-type water supply well located behind the residence, along the Lllagas Creek.

No *recognized environmental conditions* were identified during the current Site inspection (see inspection photo sheets, included in Appendix A).

Phase I *Conclusions of On-Site Conditions*: We conclude the following on-site environmental conditions based on the review of available historical and agency documents, interviews, and a Site inspection:

1) **There were no <u>on-Site</u> *recognized environmental conditions* identified.**

2) **One (1) historic recognized environmental condition (HREC)** was identified which was the former, on-Site fuel release which was characterized and remediated to the satisfaction of the overseeing agency (note: a HREC is not considered a *recognized environmental condition*)**.**

3) An inactive, cistern-type, water supply well was observed behind the Site residence, along the Llagas Creek drainage (see the Aerial Site Map, Figure 3). An "inactive" well is designated as "abandoned" when: a) it has not been used in over a year, b) it has not been maintained, and 3) there are no plans for future use. Abandoned water supply wells are considered a *Recognized Environmental Condition.* Because the owners are planning to properly destroyed this well under a permit issued by the SCVWD, it is not considered abandoned or a *Recognized Environmental Condition*. Permits of this well's proper destruction should be documented.

1.2.2 Summary of Vicinity Findings

Agency records document a single fuel release in the vicinity of the subject Site (details presented in Section 5 and Appendix D). The agency documentation indicates the case was closed to the satisfaction of the agency in 1996. release cases have been characterized under agency oversight and there does not appear to be any pollutant groundwater plumes that have the potential to encroach beneath the subject Site.

In addition to the extent and location of dissolved groundwater plumes, we evaluated the potential for pollutant plume off-gassing in accordance with current standards for assessing vapor encroachment (ASTM E2600-10). As described in Section 5.4, ASTM has established search distances for volatile chemical release sites to conservatively evaluate for potential vapor (soil gas) encroachment. There were no identified chemical release sites within the established search distances.

There were no *recognized environmental conditions* identified based on review of offsite conditions**.**

1.3 Executive Summary: Conclusions and Recommendations

We have performed a standard of care, *Phase I Environmental Site Assessment* in conformance with protocols established in ASTM Practice E1527-21 for the property located at 14905 Santa Teresa Blvd in Morgan Hill (the Site There were no exceptions to, or deletions from, this practice (i.e., data gaps), as described in Section 8.0 of this report.

On-site Liabilities: This Phase I ESA review did not identify any on-site *recognized environmental conditions* (REC's), based on the review of available historical and agency documents, interviews, and a site inspection. research. However:

- HREC – A historical recognized environmental condition (not considered an recognized environmental condition defined by ASTM Standard E 1527-21). This HREC is based on the former LUST investigation closed by the overseeing regulatory body in January 2001.
- We noted the "inactive" former production well located on Site behind the residence along the Llagas Creek. This well would be considered a REC due to inactivity greater than a year and no intention of future use, however, according to the property owner, this well will be properly destroyed under permit prior to the upcoming property sale.

Off Site Liabilities: This Phase I ESA review of regulated sites did not identify any chemical release sites in the vicinity of the subject Site having the potential to encroach and or negatively impact the property.

This concludes the *Executive Summary*.

2.0 PURPOSE AND SCOPE

This report contains results of a *Phase I Environmental Site Assessment* (ESA) that has been conducted to identify environmental liabilities resulting from historic or existing environmental risks for the subject properties. Completed work tasks conformed to the recommended guidelines established by the American Society for Testing and Materials (ASTM). *Limitations and Exceptions of Assessment* are listed at the end of this report.

The purpose of this ESA is to provide a professional opinion regarding *recognized environmental conditions* at the Site, including potential impacts from known environmental problems in the surrounding area. The term "*recognized environmental conditions*", is defined as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not *recognized environmental conditions*" (ASTM Standard E 1527-21). A short list of the essential *Phase I ESA* terminology is presented after the *Assessment Findings Summary* in the Table of Contents.

2.1 Defined Scope and Methodology

The scope of services completed for this *Phase I ESA*, included the following tasks:

- We reviewed historical maps, and aerial photographs, available geologic, topographic and groundwater data of the Site and vicinity (Sections 3.3 and 4 of this report).

- We completed a visual inspection of the Site, to check for indicators that might suggest a potential source of contamination such as current hazardous materials storage or use, unusually stained ground surfaces (soils, slabs), stressed vegetation, sumps/drains/tanks, and discarded hazardous material containers (Section 6 of this report). A copy of our *Site Inspection Checklist*, which includes Site photos, is included in Appendix A.
- We reviewed a *User Questionnaire* (Section 7.1, copy of completed questionnaire provided in Appendix A).
- We completed interviews with parties who have specialized knowledge about the subject Site (Section 7.2, interviewing documentation provided in Appendix A).
- We contracted with EDR, an information research firm specializing in environmental data collection, to conduct a regulatory list search of sites with underground fuel storage tanks (UST's), contaminated sites, hazardous waste generation or treatment-storage-and disposal facilities, and landfills located within ASTM survey radius. We evaluated the locations of all identified sites in relation to the Site (see Section 5.1, *Figure 4 – Surrounding Site Regulatory Review,* and Appendix C for EDR's Radius Report, which compiles and locates regulatory records from numerous local, state, and federal agencies).
- We reviewed reasonably ascertainable records of hazardous materials storage and documented releases from online, public right-to-know local and State regulatory databases and physical archives, such as the State of California GeoTracker and EnviroStor databases, and local environmental health and/or building/planning department archives. Our review included a search for records pertaining to the subject Site and sites within the search distances established by ASTM E 1527-21 (see Section 5.1 through 5.4; Appendix D contains some referenced documents).
- We evaluated the collected information and prepared this summary report.

3.0 SITE SETTING & BACKGROUND

3.1 Site Description and Background

The subject Site is a vacated, approximately 18-acre agricultural property, containing several structures including a dilapidated barn, one house and an adjoining garage (Figure 3). An older residential dwelling was reportedly demolished in the 1990s. The remainder of the property is sporadically and in places densely vegetated, with patches of Christmas trees and orchards previously managed at the Site (see photos, Appendix A).

The one-story, wooden barn structure was built prior to 1917 (visible in topographic maps) apparently in

Aerial view of the historic barn structure in disrepair

conjunction with agricultural activities at the site. The barn is currently used to house a few sheep and miscellaneous storage. There is no evidence of current chemical storage within the barn or its vicinity. There are some tools and agricultural equipment, apparent remnants of the Christmas tree farm operations conducted on the Site by previous owners.

Aerial photographs indicate the residence and associated garage were built sometime in the early 1960s. The house and garage are in good condition and are well maintained. There is no evidence of significant hazardous materials or petroleum products storage associated with these structures, aside from small quantity household fuel and chemical storage for automotive and property maintenance.

Site topography is generally flat, ranging from 340 to 350 feet above mean sea level (MSL). In the northwest portion of the property, a large man-made inclined mound is present.

The surrounding land-use is a combination of residential and agricultural, with increasing residential development to the east and north of the subject Site since the 1980s (see Figure 2 – Vicinity Map).

Historical land-use maps and records are discussed in Section 4 and the corresponding Sanborn Maps, historical aerial photographs and telephone directories are presented in Appendix B.

3.1.1 Utilities, Wells, and Storage Tanks

Utilities: Electrical provided by PG&E, Residence on septic system.

Wells/Sumps: One active well supplies the residence, inactive well located behind residence in Llagas Creek, reportedly set for destruction.

Storage Tanks: One large poly tank for water storage is located next to active well infrastructure.

3.2 Local Geological and Hydrogeological Conditions

The subject Site lies in the southern portion of Santa Clara Valley at an elevation of approximately 340 feet above Mean Sea Level on the eastern flank of the Santa Cruz Mountains. The geologic structure of the area is controlled by northwest/southeast trending faults with mountains and valleys with the same orientation. The Santa Clara Valley is bounded by the Santa Cruz Mountains to the southwest and the Diablo Mountain Range to the northeast. The general vicinity is underlain by alluvial fan deposits over inter-bedded shale and sandstone bedrock. Unconsolidated surface soils are typically coarse grained alluvial fan sediments which include fine to coarse grained gravel and sand, with some silt and clay present. These alluvial fan deposits are inter-bedded with finer gravel, sand, silt, and clay stream deposits as they progress towards the center of the valley.

Surface soils underlying the Site and vicinity generally consist of Alluvial deposits (Qha)

Groundwater in the vicinity of the subject site is unconfined, and flows generally to the east to northeast towards Llagas

Creek. The depth to groundwater in the vicinity of the Site has been documented to be approximately 10-15 feet below ground surface.

4.0 HISTORICAL REVIEW

Historical maps, telephone directories, and aerial photographs can be a valuable resource for determining obvious past uses of the property. These records can provide evidence of notable land use changes to the property and potential clues of hazardous material storage (copies of these historical records are included in Appendix B). Land-use observations of these historical records are summarized below.

4.1 City Telephone Directories

Historical City Telephone Directories from 1971 through 2020 were available from a combination historical directory listing services. Copies of the reviewed listings are provided in Appendix B, under 'EDR City Directory'. This records review identified the occupants of the subject Site as follows (land-uses of potential concern are highlighted in boldface):

Target Property Occupants/Businesses		
Site Address	***Year***	***Occupants***
14905 Santa Teresa Blvd. *(subject Site)*	2020	No Listing
	2017	No Listing
	2014	No Listing
	2010	No Listing
	2005	Robin Bear (Residential)
	2000	No Listing
	1995	No Listing
	1992	LLagas Creek Christmas Tree
	1985	LLagas Creek Christmas Tree, John Jones
	1981	LLagas Creek Christmas Tree, John Jones
	1976	LLagas Creek Christmas Tree, John Jones
	1971	John Jones, Hubert Hancock

Vicinity Land-Uses: This record check listed the occupants of the adjoining/vicinity parcels as follows. Commercial/industrial land-uses that could be a potential source of concern are highlighted in **boldface**. Upgradient, side gradient and downgradient refer to the hydraulic position of the nearby property in relation to the subject Site.

Vicinity Property Occupants/Businesses		
Site Address	***Year***	***Occupants***
14905 Watsonville Road *Up-gradient*	2020	Residential
	2017	Residential

Vicinity Property Occupants/Businesses		
Site Address	***Year***	***Occupants***
(116 ft W)	2014	Residential
	2010	Residential
	2005	Residential
	2000	Residential
	1995	Residential
	1992	Residential
	1985	Rist Lillie (Residential)
	1981	Rist Lillie (Residential)
	1976	Rist Lillie (Residential)
	1971	Rist Lillie (Residential)

In summary, reverse phone directories show *on-site* historical land-use had been agricultural from at least 1976 to 1992. Land use in the greater vicinity has been largely agricultural and residential.

4.2 Sanborn Fire Insurance Maps

Sanborn fire insurance maps provide detailed snapshots of historical land-use within generally urban locations where an insurance company provided coverage. The Sanborn Map database was reviewed, and coverage was not available for the Subject Site (see Appendix B for the EDR Sanborn Report).

4.3 Aerial Photographs

Fourteen (14) historical aerial photographs ranging from 1939 through 2020 were obtained from EDR's collection. These aerial photographs provide snapshots of historical land-usage over the last 80 years. Copies of these same aerial photos are provided in Appendix B, which show more detail on the surrounding area than can be described in the summary descriptions below. The aerial photographs generally have approximate scales of 1 inch = 500 feet. The following table summarizes land-use observations from the available aerial photographs.

Year	*On-Site* Aerial Photo Observations	*Off-Site* Aerial Photo Observations
1939	The Subject Site appears to be in agricultural use with orchard rows covering the majority of the property. The property appears to be just a portion of a much larger agricultural property. A group of structures near the eastern corner of the property appear to be domestic residences or agricultural structures. A creek runs along the southeast border of the property.	The surrounding area appears to be agricultural or undeveloped land (possibly for grazing). Orchard rows comprise the majority of the properties surrounding the Site. Santa Teresa Blvd bisects the surrounding area in a southwest-northeast direction.
1948	The Site appears similar to the previous image however an area has been cleared in the south	The surrounding area generally appears as it did in the previous image.

Year	***On-Site*** **Aerial Photo Observations**	***Off-Site*** **Aerial Photo Observations**
	corner for development of a couple new structures.	
1950	The Site appears mostly unchanged, the previously cleared patch in the south is now populated with trees.	The surrounding area appears mostly unchanged.
1956 To 1970	The Site appears to be mostly unchanged from the previous image.	The surrounding area appears mostly unchanged.
1982	The orchards in the northern half of the Site appeared to have been removed or discontinued.	Residential neighborhoods have been developed to the north and northeast. Rural residential appears to adjoin Site the southwest.
1993	The Site appears mostly unchanged from the previous image.	The surrounding area continues to develop to the north and northeast with residential units.
1998	The Site appears mostly unchanged from the previous image.	Residential neighborhoods continue to develop along the east.
2006 to 2020	Site appears mostly unchanged during this time.	Residential development to the east continued during this time.

Historical aerial photographs taken between 1939–2020 show that the subject Site has remained an agricultural property. The surrounding land-use was historically agricultural, with increasing residential development from the 1980s onward.

4.4 Topographic Maps

Historical topographic maps, which include the subject property and surrounding sites, were obtained, and reviewed (see Appendix B). There is no evidence from these topographic maps of significant geophysical or hydrogeological changes at the Site or surrounding area that would indicate the potential for negative impacts to Site soil or groundwater conditions.

4.5 Summary of Historical Review

In summary, no obvious environmental conditions of concern were observed during our historical review for the subject Site or from properties in the Site vicinity. An integrated summary of the accumulated Phase I ESA findings is presented below, in Section 9.0 – Findings & Opinions.

5.0 REGULATORY AGENCY INFORMATION

5.1 Database Search of Federal and State Environmental Records

Records of hazardous material, petroleum products and waste storage, as well as unauthorized releases of said materials into the environment, are required by law to be maintained by regulatory agencies overseeing these environmental conditions. An information research firm specializing in environmental data collection, *Environmental Data Resources (EDR)*, generated a Radius Map Report for the Site (included in Appendix C). The Radius Map Report identifies sites listed in the selected regulatory databases, presents location maps and details on identified sites, provides a description of the Federal and State agency data reviewed, and limitations to the search. The search specifically documents sites having registered underground fuel storage tanks (UST's), hazardous waste generation, hazardous waste treatment-storage-disposal, and subsurface contamination. Search distances are per ASTM's E-1527 13 standard (see Appendix C for a list of all sites and full descriptions of all regulatory databases). The database search identified the following information for the target property and surrounding sites.

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
Lists of state- and tribal (Superfund) equivalent sites								
RESPONSE	1.000		0	0	0	0	NR	0
Lists of state- and tribal hazardous waste facilities								
ENVIROSTOR	1.000		0	0	0	0	NR	0
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Lists of state and tribal leaking storage tanks								
LUST	0.500	2	2	0	1	NR	NR	5
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
HIST LUST	0.500	1	1	0	0	NR	NR	2
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250	1	1	0	NR	NR	NR	2
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0

NR = Not reviewed, as per the search distances established in ASTM 1527-21. This table was excerpted from the EDR Radius Report, provided in Appendix C.
A full list of the databases reviewed is provided on page GR-1 of EDR's report. EDR updates many of these listings on a quarterly or semi-annual basis.

5.1.1 Subject Property

14905 Santa Teresa Blvd ("*Target property" in EDR Radius Report*) ***was listed*** in a number of the regulatory databases. The Site has a record of a fuel release (LUST, HIST CORTESE), a record of formerly maintaining an UST (HIST UST) and as a one-time generator of hazardous waste (HAZNET). No other historical regulatory records were found for the subject Site. Further details are provided in the table below:

Facility / Location/ Database Source(s)	Details
Subject Site (Former Jones Christmas Tree Farm) 14905 Santa Teresa Blvd.	**Leaking Underground Storage Tank (LUST): Closed** Former Jones Christmas Tree Farm operated as a Christmas tree farm at the subject Site that managed a 1,000-gasoline UST and a 500-gallon gasoline AST. Both tanks were removed from the property in 1997, after which a release investigation and cleanup was conducted.
Databases Listed: LUST, Cortese, Haznet, Hist UST	Summary of Investigations: In 1997 a subsurface sampling investigation was performed in the vicinity of an AST on the property. This AST had been emptied and was no longer in service at the time of this investigation. Two test pits were excavated for this investigation to look for surficial soil contamination from the operation of the former AST. An area of soil with hydrocarbon odor was encountered in the second test pit excavated for this investigation. This test pit was extended down to shallow groundwater and all obviously contaminated soils were removed (approximately 85 yd^3). Then, in May 1997 a 1,000-gallon UST was excavated and removed from the Site. Discolored soil and strong hydrocarbon odors were observed beneath the former UST. The UST excavation was enlarged in an attempt to remove the contaminated soils. Approximately 40 yd^3 of contaminated soil was removed from the UST excavation. No additional soil contamination above the water table was identified. Hydrocarbon discoloration was visible below 12 feet, at the groundwater interface. Gasoline hydrocarbons were detected in the groundwater sample collected from the old water supply well, with concentrations of benzene exceeding the state Drinking Water Standards (see well location depicted on Site Map – Figure 3). The old water supply well was located approximately 80 feet down-gradient from the UST on the property. This well was sealed and abandoned under SCVWD permit, and replaced with a deeper production well in 1998. **The only significant area of contamination identified in this subsurface investigation was the groundwater in the immediate vicinity of the former UST, with no contaminants detected in the groundwater sample collected from the down-gradient well MW-1.** As part of this investigation, the domestic water supply system was also sampled. Water samples were collected from the Kitchen Sink at the residence, a Yard faucet, and from the new supply well. The results of water sample analysis revealed residual levels of contamination in the piping leading from the new supply well to the residence. **Quarterly groundwater monitoring at the site was discontinued following SCVWD closure of the fuel leak case at the site. SCVWD closure of the fuel leak investigation at the site was officially granted in a letter dated January 9, 2001.**

Facility / Location/ Database Source(s)	Details
	The four groundwater monitoring wells at the site were properly destroyed with SCVWD oversight in March of 2001. Proper destruction of the site groundwater monitoring wells was the final task required by the SCVWD for complete closure of the fuel leak investigation. Agency archive hyperlink: - https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608591843

5.1.2 Surrounding Sites

Our review of the EDR Radius Report revealed the following notable business operations / properties in the Site vicinity that have notable records of hazardous materials and/or petroleum hydrocarbon releases, waste generators and other notable regulated activities.

- Federal Chemical/Fuel Release Sites: The records search **did not identify any sites** located within a 1-mile radius from the subject Site that was listed on the USEPA National Priority List (NPL) or Superfund.

State Chemical/Fuel Release Sites: The records search **identified one (1) site located within a ¼-mile radius** of the Site as having a record of a petroleum or other chemical impact to soil or groundwater [i.e., Leaking Underground Storage Tanks (LUST), Cortese, Spills Leaks Investigations and Cleanup (SLIC), Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and Voluntary Cleanup Priority Listing (VCP)]. **One (1) of these sites are located within ⅛-mile radius** from the subject Site, while the remainder are situated between ⅛- and ¼-mile radius from the subject Site. See *Figure 5* for relative locations of these completed release investigations.

  - One (1) release case has obtained case closure from the applicable regulatory agency and is upgradient of the Site.

Brief descriptions of these cases are presented in the table below.

Facility / Location/ Database Source(s)	Details
Former Rist Quarry 14905 Watsonville Road (116 ft W) **Upgradient** Databases Listed: LUST, Cortese, CERS	**Leaking Underground Storage Tank (LUST): Closed** Former JR Norton Co. operated at this adjoining, upgradient property. A 4,000-gallon gasoline and 1,000-gallon diesel UST were removed from the property in 1989, and indications of a release were observed. A fuel release investigation of the aged diesel release; located approximately 550 feet upgradient from the Site boundary to the west was completed. One monitoring well was installed, which did not provide sufficient location/depth data to calculate groundwater flow direction. The release was gauged to be limited and the overseeing agency staff granted site closure. Link: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608539262

- Underground Storage Tanks (USTs): The database search of generally historical regulatory records **identified one (1) sites** located within a ¼-mile radius having a current or historical record of permitted UST's (UST, HIST UST, SWEEPS UST, Cal FID UST and/or Indian UST).

- Hazardous Waste: The records search **did not identify any sites** located within a ¼-mile radius as having records showing generation and proper disposal of hazardous waste, typically a waste oil or oily waste (RCRA-SQG, RCRA-LQG, RCRA-NonGen, FINDS, Notify 65, EDR Proprietary Records).
- Dry Cleaners: The records **did not identify any sites** operating as dry cleaners within ¼-mile radius.
- Orphan Sites: The EDR report lists **one (1)** unmapped sites ("***orphans***") obtained from the list of databases, for which EDR was not able to determine an exact location. Upon further review, these listings do not pertain to conditions of concern on properties that are hydraulically upgradient or adjoining to the subject Site.

Combined *Regulated Hazardous Sites - ¼-Mile Radius Map* (Figure 8): A comprehensive radius map documenting nearby release sites, hazardous materials and waste management sites, UST/AST storage and other significant regulated environmental conditions, is presented on Figure 4.

5.2 Geotracker / EnviroStor File Review

Records of hazardous materials storage and releases can also be found in state regulatory agency databases, such as the California *State Water Resources Control Board* Geotracker® database and *Department of Toxic Substances Control* EnviroStor® database. A review was conducted for records on the subject Site, vicinity properties, and additional sites identified in the Federal and State environmental database review detailed in Section 5.1.

- Our review of the California State GeoTracker database, conducted in August 2023, did not reveal any additional sites within a ¼-mile radius of the subject Site as having a record of a release of contamination to soil or groundwater (see Figure 8 – 'Surrounding Site Regulatory Review').

5.3 Local Oversight Agency File Reviews

Subject Site Records: Records regarding the Site were requested via the Santa Clara County Environmental Health public records request. Two reports were provided documenting the on-Site AST investigation and UST closure in 1997 (see report summaries above in section 5.1.1 and copies of the reports in Appendix D). No other documentation was provided.

5.4 Vapor Encroachment Conditions (VEC) Review

In accordance with current standards for assessing vapor encroachment (ASTM E2600-10), we evaluated the Site and its vicinity for vapor encroachment conditions, or conditions that may indicate that sources and pathways for hazardous volatized chemicals to enter current or future on-site buildings that are present at the Site and/or Site vicinity. ASTM E 2600-10 defines the following minimum search distances for the *Area of Concern* for vapor encroachment:

- **1/3-mile** for known or suspected volatile/semi-volatile chemical contaminated sites (e.g., a dry cleaners site with a PCE release)
    - We reviewed the nearby *solvent / volatile organic compound (VOC) release sites* discussed in Section 5.1-5.3 and assessed them for vapor encroachment potential (copy included in Appendix C). We **did not identify any** nearby solvent / volatile organic compound (solvent)

release sites located within a 1/3-mile radius of the subject Site with the potential of encroachment.

- **1/10-mile** for known or suspected petroleum hydrocarbon contaminated sites (e.g., a gasoline release from a fueling station)
    - We reviewed the nearby *petroleum hydrocarbon release sites* discussed in Section 5.1 for vapor encroachment potential. We **did not identify any** site within a 1/10-mile radius of the subject Site as having a documented VOC-containing plume with potential of encroachment.

We did not identify any sites within the applicable search distances as having the potential to pose the risk of vapor encroachment on the subject Site.

5.5 Summary of Regulatory Review

In summary, no obvious environmental conditions of concern were observed during our historical review for the subject Site or from properties in the Site vicinity.

6.0 USER QUESTIONNAIRE & INTERVIEWS

6.1 User Questionnaire

A *User Questionnaire* was completed by Doug Blackwell, Manager (the User), signed on July 23, 2023.

User Questionnaire Summary	
Reason for Performing ESA?	Other: Land use application – City of Morgan Hill
Environmental Liens?	No.
Land-Use Limitations?	No.
Any Specialized Knowledge of the Subject Site or Adjoining Properties?	No
Discounted Price Relative to Fair Market Value?	NA.
Current or Historical Chemical/Hazardous Materials Usage?	No
Environmental Clean Ups	No

The User indicated that the *Phase I ESA* is being completed as requirements for the City of Morgan Hill land use application.

6.2 Additional User Provided Documentation

The User did not provide any additional information pertaining to hazardous materials and environmental conditions at the Site.

6.3 Summary of Questionnaire/Interview Review

The *User Questionnaire* and *interviews* are intended to identify previous or current land-uses that may indicate environmental impacts or provide further details regarding previously identified environmental impacts and regulatory release investigation cases. Our interview with Doug Blackwell did not reveal any additional items of concern pertaining to the Subject Site. Copies of interviewing documentation are included in Appendix A.

7.0 SITE INSPECTION

7.1 Overview

A Site inspection was conducted on July 27, 2023, to note potential sources of contamination associated with on-site activities. A copy of the completed *Site Inspection Checklist*, which contains detailed documentation of the Site survey including a photographic record of the inspection, is presented in Appendix A.

Site Inspection Observations	
Subject Property Observations:	
Current Use of Property: The Site is an approximate 18-acre agricultural property which contains a residence, detached garage, and dilapidated barn structure. The remainder of the Site is covered in patches of overgrown Christmas trees, walnut trees, and other miscellaneous vegetation. The Site topography is relatively flat, however contains a large mound area near Watsonville Road. Doug Blackwell confirmed this dirt mound is imported fill material as well as stockpiled recycled asphalt/baserock material for covering the roads. The Site also has one active well and associated water tank for domestic water supply. The barn structure was built prior to 1917 and is currently utilized for housing a few farm animals, and miscellaneous storage. There was no evidence of any bulk chemical storage or use. Some relic farm equipment was also observed near the barn. The residence and associated garage unit are occupied by a tenant. The house appeared to be well maintained. No evidence of any bulk chemical storage or use. There is an inactive well located behind the residence near the Llagas creek. It appeared to be not connected, but capped, reportedly planned for destruction. No significant changes since the 2013 assessment.	
Potable Water Source	Well water
Interior Drains? Where to?	None observed
Sewage Disposal Source	Septic
Pools of Liquid / Odors?	No pools or odors were observed.
Hydraulic equipment?	None observed.
Storage tanks?	One large poly water tank connected to well.

Site Inspection Observations	
Subject Property Exterior Observations:	
Pits, Ponds, Lagoons?	Llagas creek runs adjacent to residence on the southeast
Stained soil or pavement?	None observed
Storm water discharge?	None observed
Wells or Water Towers?	One active well connected to residence. One inactive well located behind residence in Llagas Creek, reportedly set for destruction.
Sumps?	None observed.
Electrical Infrastructure?	Overhead electrical lines
Hazardous Materials or Petroleum Products?	None observed.
Neighborhood Observations:	
Topography of property and vicinity	Mostly flat. Large dirt mound on the northwest perimeter.
Current uses of adjoining properties	**West:** Agricultural/Residential **South:** Residential **East:** Residential **North:** Residential

7.2 Summary of Site Inspection

The inspection showed the subject property is largely a vacant agricultural property covered in overgrown Christmas trees, walnut trees, and other native vegetation. The single-family home appeared well maintained and was occupied by a tenant. The barn appeared in relatively poor condition but is currently utilized to house a few sheep who maintain the vegetation across the Site. There were no signs of any bulk chemical use or storage. There are two known wells on Site, one well is active and supplies the residence, the other well is inactive and is located in the Llagas Creek behind the residence and is the former production well for the Site. The Site contact and property owner reports that the Santa Clara Valley Water District (SCVWD) is aware of the inactive well and has plans for proper well destruction prior to the property sale. No recognized environmental conditions were identified based on current Site conditions observed during the inspection.

8.0 DATA GAPS

We discovered no data gaps during this investigation.

9.0 FINDINGS & OPINIONS

9.1 Subject Site

Physical Setting: The subject Site is a flat-lying, approximately 18-acre, two parcel agricultural property located in a mixed residential and agricultural area of Morgan Hill (see Section 3.0 for full details). The Site contains several structures that are clustered in the eastern portion of the property including a single-family residence and detached garage, a historic barn, and a construction trailer. The remaining acreage of the relatively flat-lying property contains a mixture of relic trees from previous farming operations (Christmas and walnut trees) and grasses. (see aerial clip to right and photos in Appendix A).

Historical aerial photographs show the Site has remained an agricultural property since at least 1939 (copies of the historical aerials are included in Appendix B). The Site is bound by Santa Teresa Blvd and residential neighborhoods to the northeast, Watsonville Road and mixed agricultural/residential to the northwest, and rural residential to the southwest, south, and southeast. Eastward flowing Llagas Creek boarders the southeast property boundary (see the *Aerial Vicinity Map*, Figure 2). Previous on-site gauging of first encountered groundwater beneath the Site documented a seasonal fluctuation of depths 12-to-18 feet below ground surface (bgs) and a northeasterly flow direction.

Phase I *Historical Document Review* (details in Section 4.0): Historical aerial photographs combined with reverse telephone directories indicates that the subject Site was continuously used for agricultural purposes for over 80 years (the 1939 aerial shows cultivated lands). Orchard and row crop cultivation operations appear to slow or cease in the mid 1990's.

Prior to 1980, adjoining and vicinity land-use was predominantly agricultural. There was a significant land use transition to residential in the vicinity of the Site after 1980 coinciding with the growth of Morgan Hill (copies of historical aerials included in Appendix B).

Phase I *Review of Agency Records* (details in Section 5.0): Agency records of the subject site document the discovery and removal of an abandoned, 1,000 gallon, underground storage tank (UST). The UST was removed in May 1997 and a limited volume of impacted soils was removed to a depth of shallow groundwater, which was encountered at a depth of 14 feet below ground surface (bgs). Subsequent delineation investigations and two (2) years of groundwater monitoring confirmed the gasoline release was very limited and attenuating over time. An old domestic well was properly destroyed as part of case closure activities. The characterization and cleanup of the fuel release was completed to the satisfaction of overseeing agency, and staff issued a "*No Further Action*", case closure letter in 2001. The record of this agency-closed, fuel release case is considered a ***historical recognized environmental condition*** **(HREC)**.

> *Non-Agency Required, Property Transaction Property Screening Assessment*: In 2013, a Phase I ESA, and *Phase II Limited Soil, Soil Vapor and Groundwater Sampling Investigation* were completed to evaluate *potential* environmental liabilities that may have resulted from long term agricultural operations at the property. Testing targeted: a) a follow-up check of the agency-closed, former UST release, and b) a screening of shallow soil to check for the presence of persistent pesticides. Laboratory test results confirmed no significant impacts from either the former fuel release location or the agricultural fields. The sampling included testing for asbestos

and lead around the perimeter of site structures to evaluate potential impacts from building materials. No asbestos was detected but some very limited lead impacts were detected in shallow soils around the perimeter of the buildings (typical residue of lead-based paint chipping). Overall, the results showed that there were no significant environmental impacts discovered on Site base as a result of historical/current land uses (Appendix D includes text, summary tables and figures from this report).

Phase I *User Questionnaire* (details in Section 6.0): No additional environmental conditions of concern were revealed for the Site and vicinity properties from the review of agency records or from the *User Questionnaire*.

Phase I *Site Inspection* (details in Section 7.0): The *Phase I ESA* includes an inspection of current environmental conditions at the Site. The inspection showed the agricultural property to be largely vacant with site improvements in the eastern portion of the site and the remainder containing clusters of vegetation (i.e., overgrown Christmas trees, walnut trees, and other wild shrubs and grasses). The single-family home appeared well maintained and was occupied by a tenant. The barn appeared to be in relatively poor condition but safe enough to house a few sheep. The sheep are used to control the grasses and shrubs across the vacated (not actively managed) ag-fields. No containers of bulk chemical were observed during the inspection.

There are two (2) water supply wells on the property. A 5-inch diameter well installed in 1998 provides drinking water to the residence (a copy of the drillers well log is included in Appendix D). The second, is an inactive, cistern-type, water supply well located along the Llagas Creek drainage behind the residence (see the *Aerial Site Map,* Figure 3). Inactive and abandoned wells are required to be properly destroyed under a permit issued by the Santa Clara Valley Water District (SCVWD). The property owner has reported that SCVWD is aware of this inactive cistern-type water supply well and there are plans in place for the proper well destruction and as such, it is not considered a *recognized environmental condition*.

No *recognized environmental conditions* were identified during the current Site inspection (see inspection photo sheets, included in Appendix A).

Phase I *Conclusions of On-Site Conditions*: We conclude the following on-site environmental conditions based on the review of available historical and agency documents, interviews, and a Site inspection:

1) **There were no <u>on-Site</u> *recognized environmental conditions* identified.**
2) **One (1) historic recognized environmental condition (HREC)** was identified which was the former, on-Site fuel release which was characterized and remediated to the satisfaction of the overseeing agency (note: a HREC is not considered a *recognized environmental condition*)**.**

An inactive, cistern-type, water supply well was observed behind the Site residence, along the Llagas Creek drainage (see the Aerial Site Map, Figure 3). An “inactive” well is designated as “abandoned” when: a) it has not been used in over a year, b) it has not been maintained, and 3) there are no plans for future use. Abandoned water supply wells are considered a *Recognized Environmental Condition.* Because the owners are planning to properly destroyed this well under a permit issued by the SCVWD, it is not considered abandoned or a *Recognized Environmental Condition*. Permits of this well’s proper destruction should be documented.

9.2 Adjoining & Vicinity Findings

Agency records document a single fuel release in the vicinity of the subject Site (details presented in Section 5 and Appendix D). The agency documentation indicates the case was closed to the satisfaction of the agency in 1996. release cases have been characterized under agency oversight and there does not appear to be any pollutant groundwater plumes that have the potential to encroach beneath the subject Site.

In addition to the extent and location of dissolved groundwater plumes, we evaluated the potential for pollutant plume off-gassing in accordance with current standards for assessing vapor encroachment (ASTM E2600-10). As described in Section 5.4, ASTM has established search distances for volatile chemical release sites to conservatively evaluate for potential vapor (soil gas) encroachment. There were no identified chemical release sites within the established search distances.

There were no *recognized environmental conditions* identified based on review of offsite conditions**.**

10.0 CONCLUSIONS & RECOMMENDATIONS

We have performed a standard of care, *Phase I Environmental Site Assessment* in conformance with protocols established in ASTM Practice E1527-21 for the property located at 14905 Santa Teresa Blvd in Morgan Hill (the Site There were no exceptions to, or deletions from, this practice (i.e., data gaps), as described in Section 8.0 of this report.

On-site Liabilities: This Phase I ESA review did not identify any on-site *recognized environmental conditions* (REC's), based on the review of available historical and agency documents, interviews, and a site inspection. research. However:

- HREC – A historical recognized environmental condition (not considered an recognized environmental condition defined by ASTM Standard E 1527-21). This HREC is based on the former LUST investigation closed by the overseeing regulatory body in January 2001.
- We noted the "inactive" former production well located on Site behind the residence along the Llagas Creek. This well would be considered a REC due to inactivity greater than a year and no intention of future use, however, according to the property owner, this well will be properly destroyed under permit prior to the upcoming property sale.

Off Site Liabilities: This Phase I ESA review of regulated sites did not identify any chemical release sites in the vicinity of the subject Site having the potential to encroach and or negatively impact the property.

11.0 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all other warranties, expressed or implied. This report has been prepared solely for our client. The assessment is provided so the client may make a more informed decision as to Site conditions. This report shall not be relied upon by or transferred to any other party or used for any other purpose. *Weber, Hayes and*

Associates will not distribute this report to any regulatory agency without the consent by the User, unless required by law or court order.

This ESA is not a regulatory compliance audit or an evaluation of the efficiency of the use of any hazardous materials at the Site. Unless otherwise stated, no evaluation for the presence of asbestos-containing building materials, Lead-based paint, urea-formaldehyde foam insulation, or other potentially hazardous building materials; methane; radon gas; Lead in drinking water; or wetlands, is included in our assessment.

Our findings and opinions are based on information collected from regulatory agency files and lists, interviews, and Site conditions at the time of our Site reconnaissance. Note that our findings and opinions are based on information that we obtained on specific dates through records review, Site reconnaissance, and related activities. It is possible that other information exists or subsequently has become known, just as it is possible for conditions, we observed to have changed after our observations.

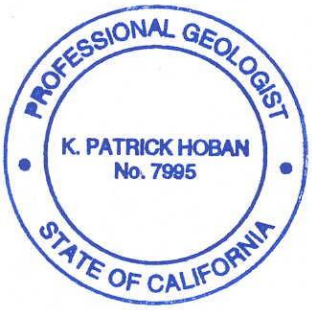
The accuracy and thoroughness of any environmental assessment depend on a variety of factors and optimally will include soil and groundwater sampling. Weber, Hayes and Associates cannot and will not provide guarantees, certifications or warranties that the investigated property is or is not free of environmental impairment. Any person who is aware of any *recognized environmental conditions* of the Site or surrounding areas that are different from those described in the report should report them immediately to this office for evaluation as part of an additional scope of work.

Thank you for this opportunity to be of service. Should you have any questions or comments regarding this project, please contact us at our offices.

Respectfully submitted,

WEBER, HAYES AND ASSOCIATES

A California Corporation



By: _____
Pat Hoban, PG
Principal Geologist

And: _____
Shaun Ersoy
Staff Scientist

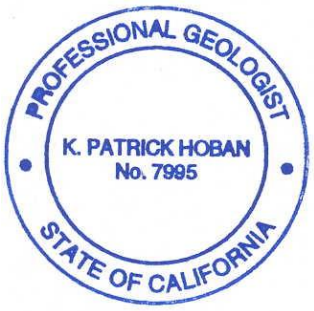
12.0 QUALIFICATION OF ENVIRONMENTAL PROFESSIONAL

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10[1] of this part.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

By _____

Pat Hoban
Principal Geologist



[1] ASTM Standard E 1527-21, X2.1.1 and Federal Register 40 CFR Part 312, §312.10:

Environmental Professional means:

(1) A person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases…on, at, in, or to a property, sufficient to meet the objectives and performance factors...

(2) Such a person must:

(i) Hold a current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) and have the equivalent of three (3) years of full-time relevant experience; or

(ii) Be licensed or certified by the federal government, a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) to perform environmental inquiries … and have the equivalent of three (3) years of full-time relevant experience; or

(iii) Have a Baccalaureate or higher degree from an accredited institution of higher education in a discipline of engineering or science and the equivalent of five (5) years of full-time relevant experience; or

(iv) Have the equivalent of ten (10) years of full-time relevant experience...

13.0 REFERENCES

Environmental Assessment Standards and State/Local Information Systems

ASTM E1527-21, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, 2021

ASTM E2600-10, *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*, 2010.

State Water Resources Control Board *Online "GeoTracker" Database*, www.geotracker.swrcb.ca.gov.

California State Department of Toxic Substances Control *Online "EnviroStor" Database*, www.envirostor.dtsc.ca.gov/public/http://www.geotracker.swrcb.ca.gov/.

Santa Cruz County *Geographic Information Systems (GIS) website*, https://gis.santacruzcounty.us/gisweb/

Regional Maps and Geologic References

The National Geologic Map Database, http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html, 2015.

Geologic Map of Santa Cruz County, California, Wagner, 2002.

Site Records and Reports

Phase I/II Environmental Site Assessment, 14905 Santa Teresa Blvd, Morgan Hill, Weber Hayes and Associates, dated September 10, 2013.

LUST Case Closure Summary, 14905 Santa Tereas Blvd, Morgan Hill, Santa Clara Valley Water District, dated January 9, 2001.

Aboveground Storage Tank Investigation, 14905 Santa Teresa Blvd, Morgan Hill. Weber Hayes and Associates, dated June 18 1997.

Underground Storage Tank Closure Report, 14905 Santa Teresa Blvd, Morgan Hill. Weber Hayes and Associates, dated June 19 1997.

14905 Santa Teresa Blvd – Private Residence
https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608500045

Nearby Property Records and Reports

14905 Watsonville Road – Rist Quarry
https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608539262

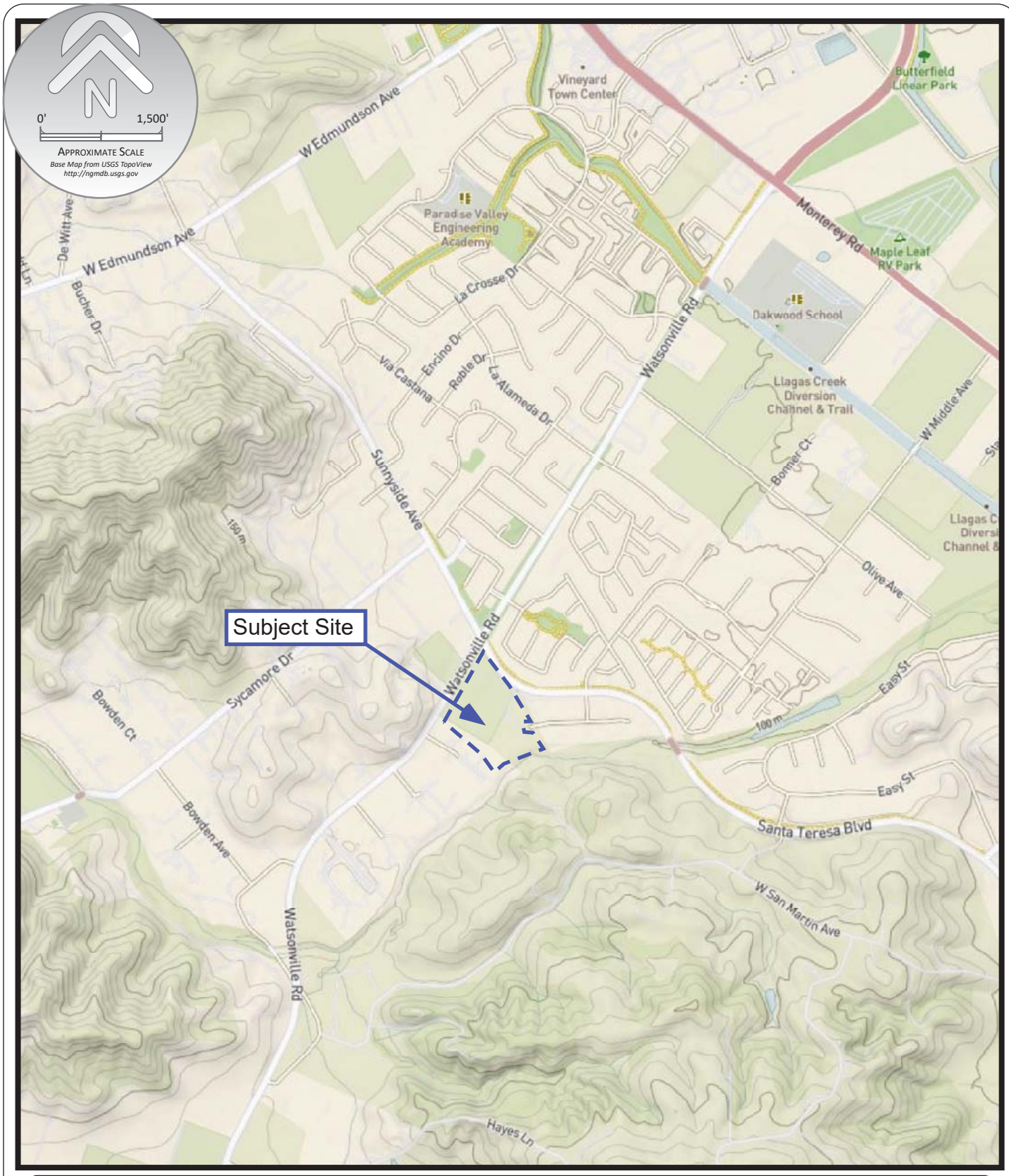
Figures

Figure 1: Location Map

Figure 2: Vicinity Map

Figure 3: Site Map

Figure 4: Regulated Hazardous Sites Map



Location Map
Phase I Environmental Site Assessment

Site: Santa Teresa Blvd ESA
Address: 14905 Santa Teresa Blvd, Morgan Hill, CA 95037

Date: August 2023

Revisions/Notes:

Figure 1
Project 2T325

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

N

0' 500'

Approximate Scale
Base Map from Google Earth

SUBJECT SITE

Residential

Residential

Residential

Closed LUST
14905 Watsonville Road

APPROXIMATE SHALLOW GROUNDWATER FLOW DIRECTION
(Based on multiple nearby monitoring well networks and regional surface water)

Howard Weichert Park
Hamilton Square Park
La Alameda Park
Oak Creek Park
Seasonal Fruit Stand
Woodlands Estates
Llagas Creek
Appian Way
La Rocca Dr
Bellini Way
Sycamore Dr
Native Dancer Dr
Exchange Dr
Santa Teresa Blvd
Leisure Dr
Walnut Dr
Watsonville Rd
Knopf Ct
East St

Vicinity Map
Phase I Environmental Site Assessment

Site: Santa Teresa Blvd ESA
Address: 14905 Santa Teresa Blvd, Morgan Hill, CA 95037

Date: August 2023

Revisions/Notes:

Figure 2
Project 2T325

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

N

0' 160'

Approximate Scale
Base Map from Google Earth

Watsonville Road

Santa Teresa Blvd

Secretariat Way

Former UST Location

Active Domestic Well

Former AST Location

Barn

Residence

Garage

Former Cistern-Type Water Supply (inactive)

Llagas Creek

APPROXIMATE SHALLOW GROUNDWATER FLOW DIRECTION
(Based on multiple nearby monitoring well networks and regional surface water)

Site Map
Phase I Environmental Site Assessment

Site: Santa Teresa Blvd ESA
Address: 14905 Santa Teresa Blvd, Morgan Hill, CA 95037
Date: August 2023

Revisions/Notes:

Figure 3
Project 2T325

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

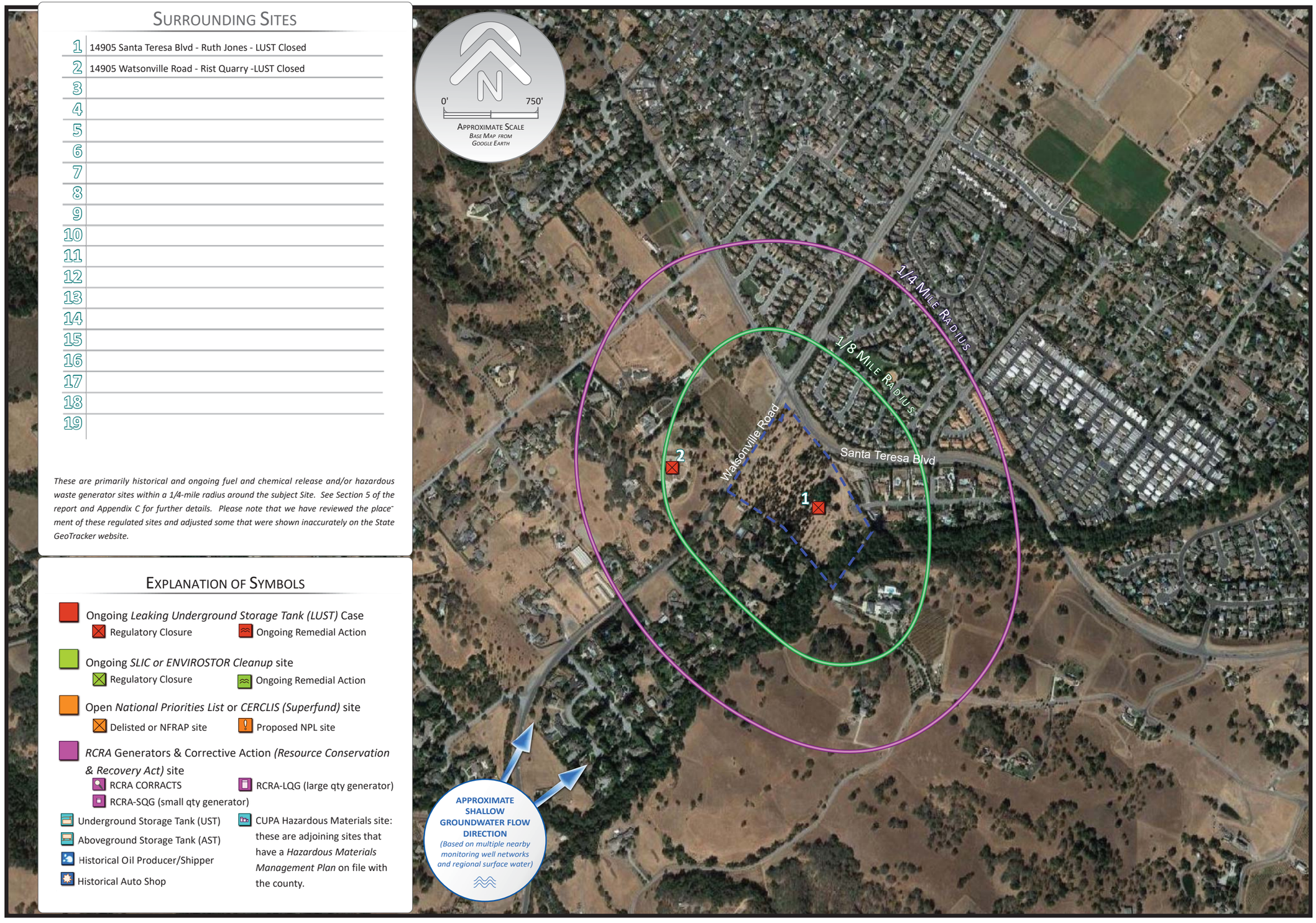
Surrounding Sites

1	14905 Santa Teresa Blvd - Ruth Jones - LUST Closed
2	14905 Watsonville Road - Rist Quarry -LUST Closed
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	

These are primarily historical and ongoing fuel and chemical release and/or hazardous waste generator sites within a 1/4-mile radius around the subject Site. See Section 5 of the report and Appendix C for further details. Please note that we have reviewed the placement of these regulated sites and adjusted some that were shown inaccurately on the State GeoTracker website.

Explanation of Symbols

- Ongoing *Leaking Underground Storage Tank (LUST)* Case
  - Regulatory Closure
  - Ongoing Remedial Action
- Ongoing *SLIC or ENVIROSTOR Cleanup* site
  - Regulatory Closure
  - Ongoing Remedial Action
- Open *National Priorities List* or *CERCLIS (Superfund)* site
  - Delisted or NFRAP site
  - Proposed NPL site
- *RCRA* Generators & Corrective Action *(Resource Conservation & Recovery Act)* site
  - RCRA CORRACTS
  - RCRA-LQG (large qty generator)
  - RCRA-SQG (small qty generator)
- Underground Storage Tank (UST)
- Aboveground Storage Tank (AST)
- Historical Oil Producer/Shipper
- Historical Auto Shop
- CUPA Hazardous Materials site: these are adjoining sites that have a *Hazardous Materials Management Plan* on file with the county.



Regulated Hazardous Sites - ¼ Mile Radius
Phase I Environmental Site Assessment

Site: Santa Teresa Blvd ESA
Address: 14905 Santa Teresa Blvd, Morgan Hill, CA 95037

Date: August 2023

Revisions/Notes: :

Figure 4

Project 2T325

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831.722.3580 / www.weber-hayes.com

APPENDIX A

COLLECTED PHASE I ESA INFORMATION

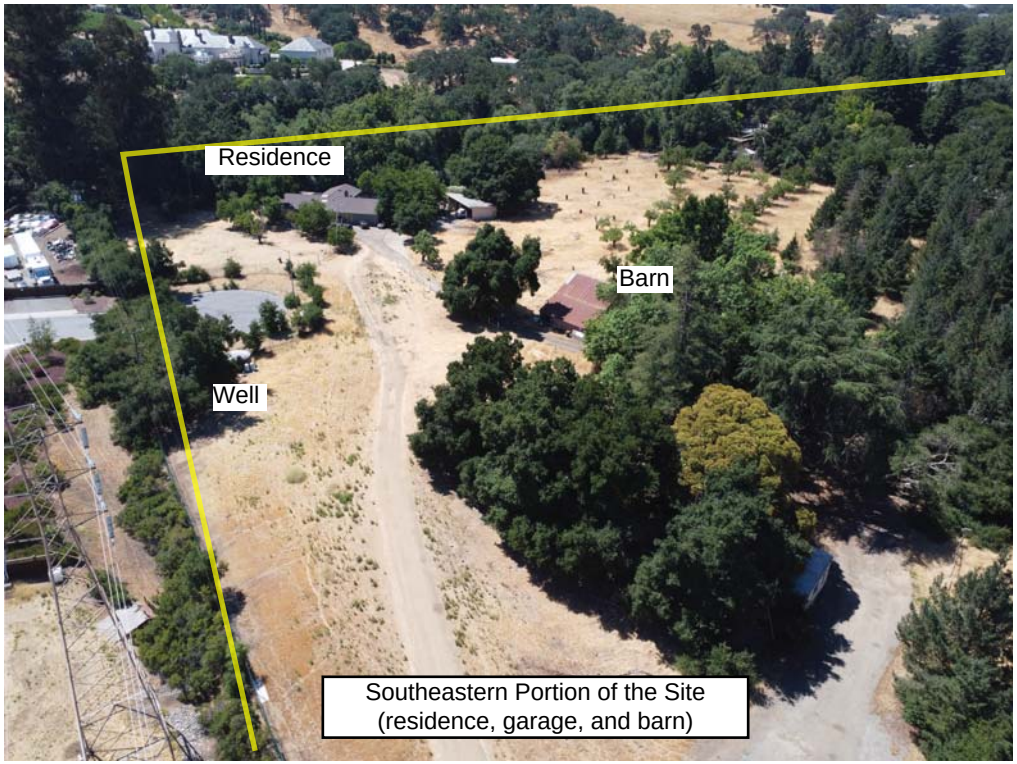
Site Inspection Checklist with Photo Sheets

Land Use Questionnaire

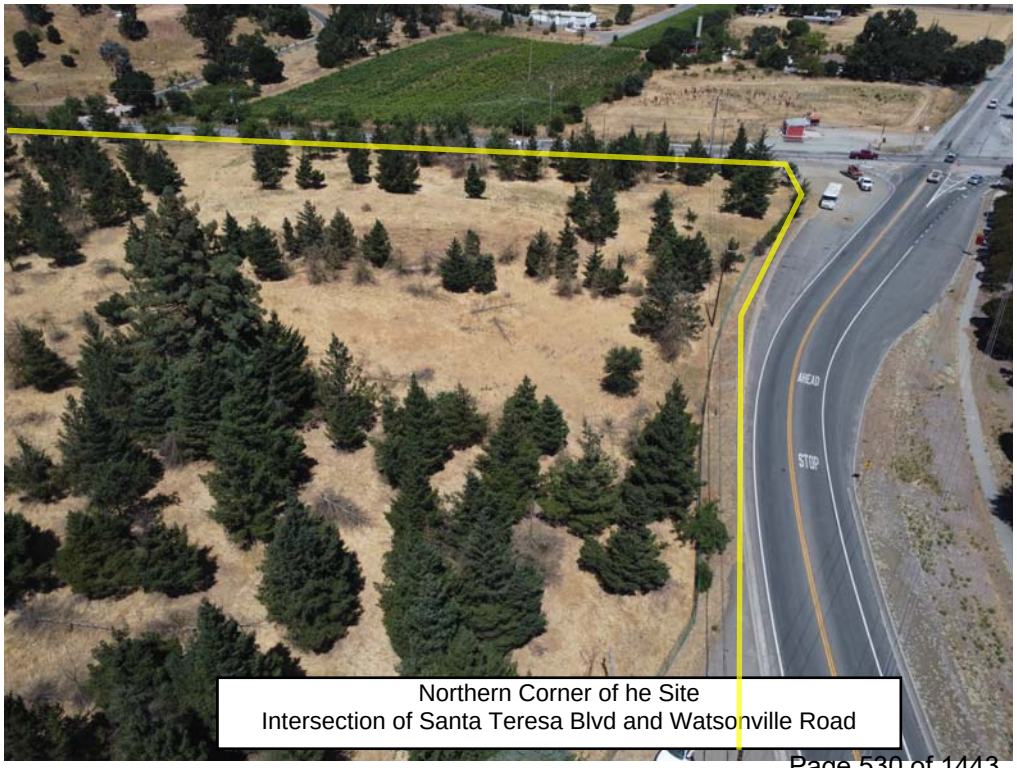
Interviewing Documentation

Adjoining & Surrounding
Land Uses

Residential Land Use
to the Northeast


Residence
Barn
Well
Southeastern Portion of the Site
(residence, garage, and barn)

Residence
Barn


AHEAD
STOP
Northern Corner of he Site
Intersection of Santa Teresa Blvd and Watsonville Road

Aerial Views Across the Subject Site

The Subject Site was a Former Christmas Tree Farm
A majority of the property contains relic Christmas trees, along with some walnut trees, and native grass and vegetation.

Relic trees from former Christmas Tree Farm

Historic Barn (currently utilized for housing sheep and for miscellaneous storage

Interior Barn

Views of the interior of the barn

Relic tractor and farm equpment located adjacent to the hisoric barn

Mobil Home
(parked adjacent to the barn)

Active Water Supply Well,
(drinking water source for the site residence)

Construction trailer recently brought on Site

Elevated mound of fill soils located
near the intersection of Santa Teresa Blvd & Watsonville Road

Aerial Views Across Site

Views of the Residence and Garage
(located near the eastern perimeter of the Site)

Garage Unit
(used for miscellaneous storage)

Yard in front of residence

Residence

Former Cistern-Type Water Supply
Located behind residence along Llagas Creek.
Plans in place to detroy under SCVWD permit

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

Phase I Environmental Site Assessment

Site Inspection Checklist

Objective: To visually evaluate and document the extent of the target property(ies) for the likely presence of *recognized environmental conditions.* Photodocumentation gathered during the site inspection are appended at the end of this form.

Site/Facility Name: Former Christmas Tree Farm

Site Address: 14905 Santa Teresa Blvd, Morgan Hill

Site Contact: Doug Blackwell (owner)

1. **Current Uses of the Property:** *To include (1) general description of the facility & commercial or industrial processes therein, (2) topography, (3) site improvements [# of buildings, size/age/condition], (4) occupants/vacancies and the nature of business operations, and (5) any indications of past site use.*

The Site is an approximate 18-acre agricultural property which contains a residence, detached garage, and dilapidated barn structure. The remainder of the Site is covered in patches of overgrown Christmas trees, walnut trees, and other miscellaneous vegetation. The Site topography is relatively flat, however contains a large mound area near Watsonville Road. Doug Blackwell confirmed this dirt mound is imported fill material as well as stockpiled recycled asphalt/baserock material for covering the roads. The Site also has one active well and associated water tank for domestic water supply.

The barn structure was built prior to 1917 and is currently utilized for housing a few farm animals, and miscellaneous storage. There was no evidence of any bulk chemical storage or use. Some relic farm equipment was also observed near the barn.

The residence and associated garage unit are occupied by a tenant. The house appeared to be well maintained. No evidence of any bulk chemical storage or use.

There is an inactive well located behind the residence near the Llagas creek. It appeared to be not connected, but capped. Reportedly planned for destruction.

No significant changes since the 2013 assessment.

2. Site Infrastructure:

	Yes	No	Notes:
▪ Any wells, water tanks or water towers?	X	☐	
▪ Boiler rooms?	☐	X	
▪ Electrical transformers?	X	☐	
▪ Septic System?	X	☐	
▪ Drainage wells or dry wells?	☐	☐	

Note observations and data for heating sources, water supply source(s), solid waste disposal and electrical systems.

Two wells, one active well with associated poly tank for domestic supply to the residence, and on inactive well located behind the residence near the creek.

Overhead electrical lines along Santa Teresa Blvd.

Residence is on a septic system.

3. Evidence of Hazardous Materials Storage & Use *(check appropriate):*

	Yes	No
▪ Haz-mat storage area(s)? Location?	☐	X
▪ Abandoned drums or containers?	☐	X
▪ Aboveground Storage Tanks?	☐	X
▪ Underground Storage Tanks?	☐	X
▪ Fuel or Chemical Dispensing Equipment or vent piping?	☐	X
▪ Pools of liquid? Characteristics?	☐	X
▪ Sumps, oil/water separators and collection pits?	☐	X
▪ Unusual Odors, staining or distressed vegetation?	☐	X
	☐	

Site appeared to have no current bulk chemical storage or use. Historically, the Site formerly contained one fuel UST and AST which was associated with the past agricultural land use. Both tanks were removed in 1997.

4. Exterior Observations:

	Yes	No
▪ Exterior surface coverings? *(describe condition, type, % native soils)*	☐	☐
▪ Paving patches/staining?	☐	☐
▪ Manholes/utility covers?	☐	☐
▪ Any stacks or HVAC units visible on roof?	☐	☐
▪ Mounds or depressions?	☐	☐
▪ Do surface water catch basins drain?	☐	☐
▪ Any ditches or drainages? *(If flow is present, identify the source)*	☐	☐
	☐	☐
	☐	☐

A large inclined man made hill composed of imported fill is present along the northwestern portion of the property. Llagas creek runs along the southeastern border of the property, flowing east-northeast.

5. Interior Observations:

	Yes	No
▪ Maintenance Areas?	☐	X
▪ Hydraulic equipment?	☐	X
▪ Interior floor staining, cracking or patching?	☐	X
▪ Interior floor drains? Outlet Sump?	☐	X
▪ Interior floor integrity (good, satisfactory or poor)?	☐	☐
	☐	

Interior of the barn contains some miscellaneous storage and appeared to be mostly used to house the sheep.

6. Describe Adjoining Site Land Uses and Note Any Areas of Concern:

Northeast – residential neighborhoods

Northwest- Watsonville Road. Low density residence

Southeast- Coyote Creek/Llagas Creek, and open space

Southwest- Low density residential

7. Any inaccessible Areas of the Property:

No

ADDITIONAL INFORMATION OBTAINED & UTILIZED DURING SITE INSPECTION

	Yes	No
Photo Sheets	☐	☐
Hazardous Materials Management Plans (HMMP)	☐	☐
Permits	☐	☐
Previous Reports/Inspections	☐	☐
Other	☐	☐
	☐	☐

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

Phase I Environmental Site Assessment
User/Client Questionnaire

Overview: *Phase I Environmental Site Assessment (ESA)* standards[1] require that the party requesting this ESA (i.e., the **"user"**, or **client**), make a good faith effort to provide and/or obtain the following disclosure items, which are generally available during the property transaction escrow process:

- Reason for contracting this Phase I ESA
- Knowledge of any environmental leans or agency restrictions on the property
- Specialized knowledge of the property
- Any discounts to the property fair-market value associated with chemical spills or releases
- Commonly known ("reasonably ascertainable") information regarding chemical storage/use
- Available environmental reports

Please provide the following information to the best of your ability.

Site/Facility Name: Blackrock, LLC
Site Address: 14905 Santa Teresa Blvd., Morgan Hill, CA 95037
User/Representative (Name/Title): Doug Blackwell, Manager

1. Reason for Performing this ESA *(check appropriate):*

O Lender: Property sale requirement for lender

O Buyer: Due diligence property screening by buyer.

O General Liability: "Landowner Liability Protections" (LLPs) as per Federal environmental laws

O Personal Comfort Level: Better understanding of land uses & potential environmental liabilities

XXX Other: Land use application - City of Morgan Hill

2. Environmental Cleanup Liens *(check appropriate):*

Yes O **No** XXX Are you aware of any ***environmental liens*** placed on the property by a regulatory agency (Federal, State or Local)?

If yes, please provide details:

[1]: ASTM Standard E 1527-05 and EPA All Appropriate Inquiries (AAI) guidelines,

3. **Land-Use Limitations** (check appropriate):

Yes O **No** Ø Are you aware of any ***"Activity Land-Use Limitations"*** *(AULs)* placed upon the Site by Federal, State or Local regulatory agencies such as engineering or institutional controls?

If yes, please provide details: _____

_____

4. **Specialized Knowledge of the User/Client** (check appropriate):

As the person or entity requesting this *Phase I ESA* ("user"), do you have any specialized knowledge or experience pertaining to the subject Site or nearby/adjoining property that would give you distinct knowledge of chemical usage and/or industrial processes at the subject Site?

Yes O **No** Ø Are you a current or former occupant of the Site?

Yes O **No** Ø Are you involved in the same type of business/industry, and are familiar with commercial/industrial processes or chemical storage

If yes, please provide details: _____

_____

_____

_____

5. **Comparison of Purchase Price to Fair Market Value** (check appropriate):

To the extent of your knowledge, does the requested purchase price of the subject Site reflect the fair market value of the property? If a discrepancy is present, have you considered whether the lower purchase price is due to environmental contamination believed to be or known to be present at the Site?

Yes O **No** O Does the property purchase price reflect a discounted value relative to fair market value?

Yes O **No** O If the property is being sold below fair market value, is the reason attributed to a known/perceived chemical release (i.e., contamination)

If yes, please provide details: N/A

_____

_____

_____

_____

_____

6. "Reasonably Ascertainable Information" (brief description):

Are you aware of any ***commonly known*** or ***reasonably ascertainable information*** pertaining chemical storage/usage on the subject Site? Specifically:

a) Prior Land Use(s): Do you know previous land use(s) at the subject Site (land uses/businesses)?

No

b) Chemical Use or Storage: Do you know of any current or historical use/storage/generation of chemicals, fuels, or hazardous waste at the subject Site?

None

c) Chemical Releases: Are you aware of any reported or unreported chemical spills or releases that occurred at the subject Site? *[Current or Historical]*

None

d) Environmental Clean-ups: Are you aware of any reported or unreported environmental cleanups that have occurred at the subject Site? *[Current or Historical]*

None

7. Degree of Obviousness of Contamination:

Based on your knowledge of the property, are you aware of any obvious indicators that would suggest the presence (or likely presence) of contamination at the subject Site?

No

8. Helpful Documents: Are you aware of existing reports (listed below) for the subject Site?

Yes	No		
Ø	O	Previous Phase I or Phase II ESAs	By WHA

3. **Land-Use Limitations** (check appropriate):

Yes O **No** Ø Are you aware of any ***"Activity Land-Use Limitations"*** *(AULs)* placed upon the Site by Federal, State or Local regulatory agencies such as engineering or institutional controls?

If yes, please provide details: _____

_____

4. **Specialized Knowledge of the User/Client** (check appropriate):

As the person or entity requesting this *Phase I ESA* ("user"), do you have any specialized knowledge or experience pertaining to the subject Site or nearby/adjoining property that would give you distinct knowledge of chemical usage and/or industrial processes at the subject Site?

Yes O **No** Ø Are you a current or former occupant of the Site?

Yes O **No** Ø Are you involved in the same type of business/industry, and are familiar with commercial/industrial processes or chemical storage

If yes, please provide details: _____

_____

_____

_____

5. **Comparison of Purchase Price to Fair Market Value** (check appropriate):

To the extent of your knowledge, does the requested purchase price of the subject Site reflect the fair market value of the property? If a discrepancy is present, have you considered whether the lower purchase price is due to environmental contamination believed to be or known to be present at the Site?

Yes O **No** O Does the property purchase price reflect a discounted value relative to fair market value?

Yes O **No** O If the property is being sold below fair market value, is the reason attributed to a known/perceived chemical release (i.e., contamination)

If yes, please provide details: N/A

_____

_____

_____

_____

_____

Additional comments to elaborate on answers (if needed):

Shaun, Anytime Thursday after 12 noon would be fine. Just email back to confirm time and I'll be there.

To the best of my knowledge I attest that the above information is true:

Signature: Douglas P. Blackwell Date: 7/23/2023

Printed Name: Douglas P. Blackwell

Title: Manager

Reference: Information & Definitions

As per **ASTM *Standard E 1527-05*** **and EPA *All Appropriate Inquiries*** **(AAI)**

"USER": The ***user*** (i.e. the party requesting this Phase I ESA), is required to provide a short list of items that are more readily available to the parties involved with the property transaction. This information is used to support the case for the *user* of the ESA to qualify for one of the *landowner liability protections* (LLPs) defenses under Federal environmental law.

APPENDIX B

HISTORICAL RESEARCH REPORTS (EDR)

City Directory Listings

Aerial Maps

Sanborn Maps

Historical Topo Maps

2T325 14905 Santa Teresa Blvd
14905 Santa Teresa Blvd
Morgan Hill, CA 95037

Inquiry Number: 7396597.5
July 26, 2023

The EDR-City Directory Image Report

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR® Environmental Data Resources Inc

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, LLC. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. This Report is provided on an "AS IS", "AS AVAILABLE" basis. **NO WARRANTY EXPRESS OR IMPLIED IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, LLC AND ITS SUBSIDIARIES, AFFILIATES AND THIRD PARTY SUPPLIERS DISCLAIM ALL WARRANTIES, OF ANY KIND OR NATURE, EXPRESS OR IMPLIED, ARISING OUT OF OR RELATED TO THIS REPORT OR ANY OF THE DATA AND INFORMATION PROVIDED IN THIS REPORT, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES REGARDING ACCURACY, QUALITY, CORRECTNESS, COMPLETENESS, COMPREHENSIVENESS, SUITABILITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, MISAPPROPRIATION, OR OTHERWISE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, LLC OR ITS SUBSIDIARIES, AFFILIATES OR THIRD PARTY SUPPLIERS BE LIABLE TO ANYONE FOR ANY DIRECT, INCIDENTAL, INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER DAMAGES OF ANY TYPE OR KIND (INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, LOSS OF USE, OR LOSS OF DATA), ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS REPORT OR ANY OF THE DATA AND INFORMATION PROVIDED IN THIS REPORT.** Any analyses, estimates, ratings, environmental risk levels, or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only an assessment performed by a qualified environmental professional can provide findings, opinions or conclusions regarding the environmental risk or conditions in, on or at any property.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available business directory data at approximately five year intervals.

RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2020	☑	☑	EDR Digital Archive
2017	☐	☑	Cole Information
2014	☑	☑	Cole Information
2010	☑	☑	Cole Information
2005	☑	☑	Cole Information
2000	☑	☑	Cole Information
1995	☐	☑	Cole Information
1992	☑	☑	Cole Information
1985	☑	☑	Haines Criss-Cross Directory
1981	☑	☑	Haines Criss-Cross Directory
1976	☑	☑	Haines Criss-Cross Directory
1971	☑	☑	Haines Criss-Cross Directory
1967	☐	☐	Polk's City Directory
1964	☐	☐	Polk's City Directory

FINDINGS

TARGET PROPERTY STREET

14905 Santa Teresa Blvd
Morgan Hill, CA 95037

Year	CD Image	Source	
SANTA TERESA BLVD			
2020	pg A1	EDR Digital Archive	
2017	-	Cole Information	Street not listed in Source
2014	pg A4	Cole Information	
2010	pg A6	Cole Information	
2005	pg A8	Cole Information	
2000	pg A10	Cole Information	
1995	-	Cole Information	Street not listed in Source
1992	pg A13	Cole Information	
1985	pg A15	Haines Criss-Cross Directory	
1981	pg A17	Haines Criss-Cross Directory	
1976	pg A19	Haines Criss-Cross Directory	
1971	pg A21	Haines Criss-Cross Directory	
1967	-	Polk's City Directory	Street not listed in Source
1964	-	Polk's City Directory	Street not listed in Source

FINDINGS

CROSS STREETS

Year	CD Image	Source	
WATSONVILLE RD			
2020	pg. A2	EDR Digital Archive	
2017	pg. A3	Cole Information	
2014	pg. A5	Cole Information	
2010	pg. A7	Cole Information	
2005	pg. A9	Cole Information	
2000	pg. A11	Cole Information	
1995	pg. A12	Cole Information	
1992	pg. A14	Cole Information	
1985	pg. A16	Haines Criss-Cross Directory	
1981	pg. A18	Haines Criss-Cross Directory	
1976	pg. A20	Haines Criss-Cross Directory	
1971	pg. A22	Haines Criss-Cross Directory	
1967	-	Polk's City Directory	Street not listed in Source
1964	-	Polk's City Directory	Street not listed in Source

City Directory Images

Target Street	Cross Street	Source
✔	-	EDR Digital Archive

SANTA TERESA BLVD 2020

14195 DENNIS STEINBACH
ELTON RANGEL
MARIE STEINBACH

Target Street	Cross Street	Source
-	✔	EDR Digital Archive

WATSONVILLE RD 2020

14665 DANA PADILLA
MICHELLE PADILLA
STEVEN PADILLA
14705 AURELIO RIOS
JENNIFER RIOS
JING RIOS
14765 MARILYN FLEISCHMAN
STEPHEN THIESSEN
14775 EMILIO OLGUIN
14825 CINDY BUCHAN
SANDRA BUCHAN
THOMAS BUCHAN
14905 GURJINDER SINGH
KUSUM ATRAYA

Target Street	Cross Street	Source
-	✓	Cole Information

WATSONVILLE RD 2017

14665 GUEVARA, DARLENE A
PADILLA, STEVE E
14765 THIESSEN, STEPHEN L
14775 OLGUIN, EMILIO
14805 BUCHAN, THOMAS M
14825 BUCHAN, CHRIS

Target Street	Cross Street	Source
✓	-	Cole Information

SANTA TERESA BLVD 2014

14195 OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
-	✓	Cole Information

WATSONVILLE RD 2014

14665 BOYLE, JENNIFER S
PADILLA, STEVE E
14705 MENDEZ, JAIME
MURPHY, DEBRA
14765 THIESSEN, STEPHEN L
14775 OCCUPANT UNKNOWN,
14805 DYSON, EDNA B
14825 BUCHAN, STEVEN W
14865 TSOUVAS, JENNIFER S

Target Street	Cross Street	Source
✓	-	Cole Information

SANTA TERESA BLVD 2010

14195 BULL, ERNESTO A

Target Street	Cross Street	Source
-	✓	Cole Information

WATSONVILLE RD 2010

14665	BIANUCCI, DANA M
	BOYLE, JENNIFER S
	RABENA, JEROME A
14705	SANCHEZ, IRMA Y
14775	TAYLOR, MATTHEW
14805	DYSON, EDNA B
14825	OCCUPANT UNKNOWN,
14865	TSOUVAS, JENNIFER S
14905	RODRIGUEZ, MARTIN

Target Street	Cross Street	Source
✓	-	Cole Information

SANTA TERESA BLVD 2005

14905	BEAR, ROBIN A

Target Street	Cross Street	Source
-	✓	Cole Information

WATSONVILLE RD 2005

14665	BOYLE, JENNIFER S
	PADILLA, STEVE E
	RABENA, JEROME A
14680	DAUBERG, LELAND M
14705	CHRISTOPHER, RICHARD T
	KEEL, LAURIE
	MOORE, ROBERT O
14765	FLEISCHMAN, MARILYN I
14775	BLOCK, LYNN L
14825	BUCHAN, SANDRA J
14905	EBRAHIMI, KLOO
15015	OCCUPANT UNKNOWN,
15035	OCCUPANT UNKNOWN,
15045	SAMARRON, SAM A

Target Street	Cross Street	Source
✓	-	Cole Information

SANTA TERESA BLVD 2000

9700	COYOTE VALLEY GOLF CENTER

Target Street	Cross Street	Source
-	✔	Cole Information

WATSONVILLE RD 2000

14680	DAUBERG, LELAND
14705	CHRISTOPHER, RICHARD T
14765	THIESSEN, STEPHEN
14775	BLOCK, CAROLYN
14805	BUCHAN, THOMAS
14825	BUCHAN, CINDY
	WHITE, LISA
14905	EBRAHIMI, K
15015	MONTECITO BOUTIQUE
	MONTECITO CHRISTMAS TREE FARM
	OCCUPANT UNKNOWN,
15045	OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
-	✔	Cole Information

WATSONVILLE RD 1995

14665	BRABANT, C
14680	DAUBERG, LELAND
14705	BARTHOLOW, RON
	CHRISTOPHER, RICHARD T
14765	FLEISCHMAN, MARILYN F
14775	BLOCK, LYNN
14825	BUCHAN, THOMAS M
14905	GRAY, ALICIA C
15015	PHILLIPS, MARY

Target Street	Cross Street	Source
✔	-	Cole Information

SANTA TERESA BLVD 1992

14905 LLAGAS CRK XMAS TR

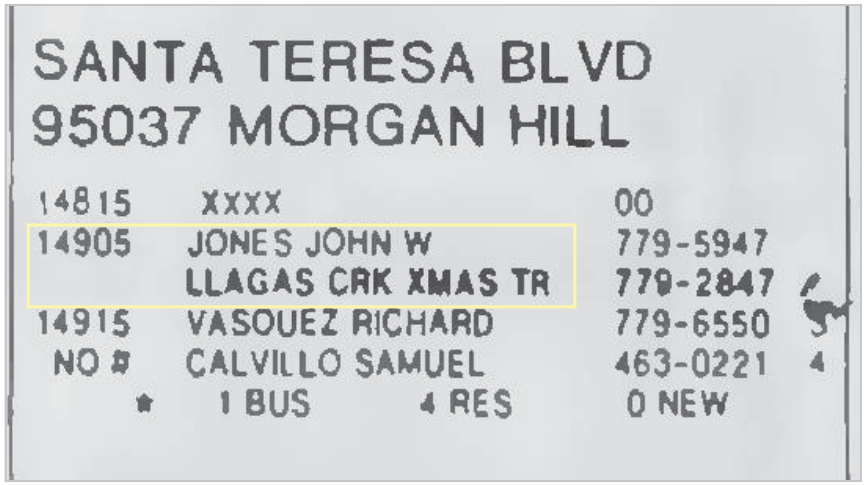
Target Street	Cross Street	Source
-	✔	Cole Information

WATSONVILLE RD 1992

14680 DAUBERG, LELAND
14705 BARTHOLOW, RON
CHRISTOPHER, RICHARD T
14765 S L T MACHINING
14775 BLOCK, LYNN
14825 BUCHAN, THOMAS M
14905 RAMESH, ABBAS
15015 MONTECITO TREE FARM
PHILLIPS, MARY

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SANTA TERESA BLVD 1985



SANTA TERESA BLVD
95037 MORGAN HILL

14815	XXXX	00
14905	JONES JOHN W	779-5947
	LLAGAS CRK XMAS TR	779-2847
14915	VASQUEZ RICHARD	779-6550
NO #	CALVILLO SAMUEL	463-0221

* 1 BUS 4 RES 0 NEW

Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

WATSONVILLE RD 1985

14665	COUPENS JOHN	779-8645	4
14680	DAUBERG LELAND	779-3923	
14705	FALLIS MARTIN	779-5894	3
14760	XXXX	00	
14765	XXXX	00	
14775	BLOCK CAROLYN	778-1697	1
	BLOCK LYNN	778-1927	1
14805	XXXX	00	
14825	BUCHAN THOMAS M	779-4687	
14905	RIST LILLIE	779-3575	
15015	MONTECITO TREE FARM	779-2569	3
	PHILLIPS DALE	779-0528	3
	PHILLIPS MARY	779-0528	
15035	XXXX	00	
15080	XXXX	00	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SANTA TERESA BLVD 1981

SANTA TERESA BLVD
95037 MORGAN HILL

14815	GONZALES RICARDO	779-6550 +1
14905	JONES JOHN W	779-5947 S
	LLAGAS CRK XMAS TR	779-2847 4
14915	XXXX	00

★ 1 BUS 3 RES 1 NEW

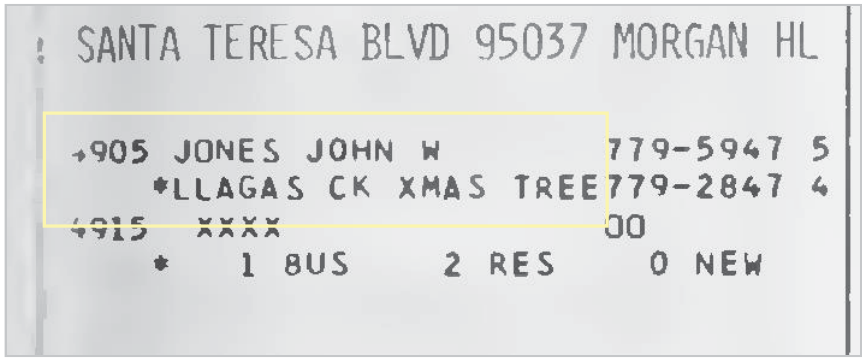
Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

WATSONVILLE RD 1981

14665	HART STEVEN	778-3192 +1
14680	DAUBERG LELAND	779-3923
14705	LEE C R	778-1967 +1
14760	XXXX	00
14765	XXXX	00
14775	BLOCK CAROLYN	778-1697 +1
	BLOCK LYNN	778-1927 +1
14790	MOSEGARD WALTER	779-2876
14805	XXXX	00
14825	BUCHAN THOMAS M	779-4687 4
14905	RIST LILLIE	779-3575
15015	PHILLIPS ELLIS D	779-2569 0
15035	XXXX	00
15080	RAMIREZ ALEX	779-2630 4

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SANTA TERESA BLVD 1976



```
SANTA TERESA BLVD 95037 MORGAN HL

+905 JONES JOHN W          779-5947 5
    *LLAGAS CK XMAS TREE   779-2847 4
4915  XXXX                 00
    *   1 BUS    2 RES     0 NEW
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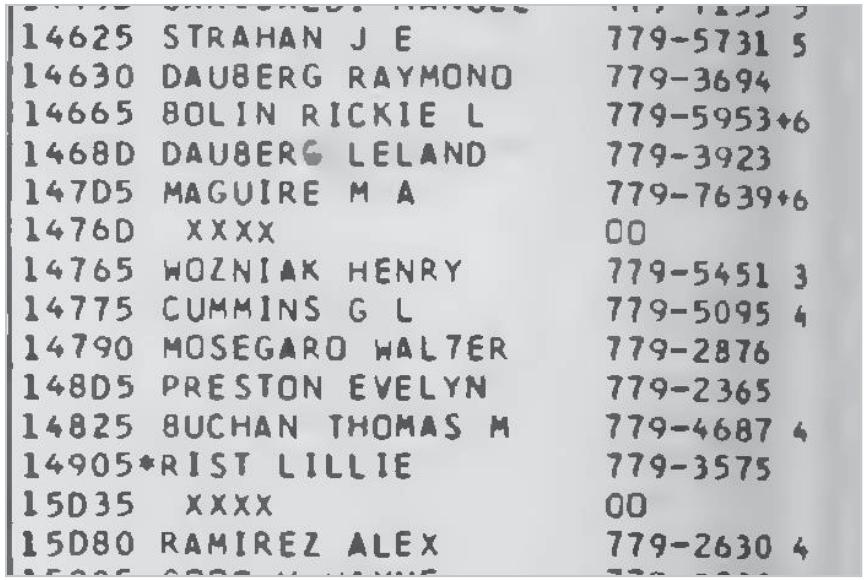
Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

WATSONVILLE RD 1976



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14625 STRAHAN J E          779-5731 5
14630 DAUBERG RAYMOND      779-3694
14665 BOLIN RICKIE L       779-5953+6
1468D DAUBERG LELAND       779-3923
147D5 MAGUIRE M A          779-7639+6
1476D  XXXX                00
14765 WOZNIAK HENRY        779-5451 3
14775 CUMMINS G L          779-5095 4
14790 MOSEGARD WALTER      779-2876
148D5 PRESTON EVELYN       779-2365
14825 BUCHAN THOMAS M      779-4687 4
14905*RIST LILLIE          779-3575
15D35  XXXX                00
15D80 RAMIREZ ALEX         779-2630 4
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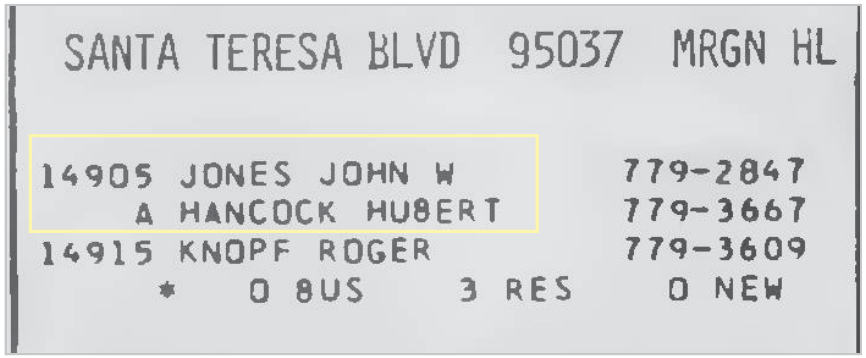
Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SANTA TERESA BLVD 1971

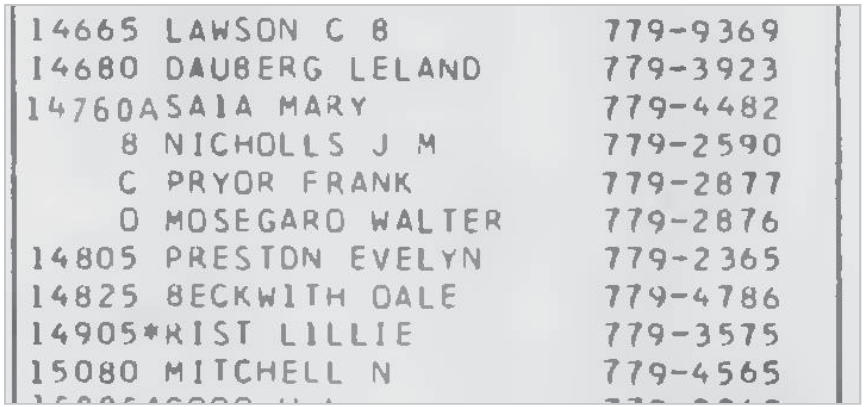


SANTA TERESA BLVD 95037 MRGN HL

14905 JONES JOHN W 779-2847
A HANCOCK HUBERT 779-3667
14915 KNOPF ROGER 779-3609
* 0 8US 3 RES 0 NEW

Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

WATSONVILLE RD 1971



14665 LAWSON C B 779-9369
14680 DAUBERG LELAND 779-3923
14760A SAIA MARY 779-4482
B NICHOLLS J M 779-2590
C PRYOR FRANK 779-2877
O MOSEGARO WALTER 779-2876
14805 PRESTON EVELYN 779-2365
14825 BECKWITH DALE 779-4786
14905* RIST LILLIE 779-3575
15080 MITCHELL N 779-4565

2T325 14905 Santa Teresa Blvd

14905 Santa Teresa Blvd

Morgan Hill, CA 95037

Inquiry Number: 7396597.8

July 21, 2023

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

07/21/23

Site Name:

2T325 14905 Santa Teresa Blv
14905 Santa Teresa Blvd
Morgan Hill, CA 95037
EDR Inquiry # 7396597.8

Client Name:

Weber, Hayes, & Associates
120 Westgate Drive
Watsonville, CA 95076
Contact: Shaun Ersoy

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Search Results:

Year	*Scale*	*Details*	*Source*
2020	1"=500'	Flight Year: 2020	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1998	1"=500'	Flight Date: August 21, 1998	USDA
1993	1"=500'	Acquisition Date: June 15, 1993	USGS/DOQQ
1982	1"=500'	Flight Date: July 05, 1982	USDA
1970	1"=500'	Flight Date: April 24, 1970	USGS
1968	1"=500'	Flight Date: June 14, 1968	USGS
1963	1"=500'	Flight Date: July 08, 1963	EDR Proprietary Aerial Viewpoint
1956	1"=500'	Flight Date: June 12, 1956	USDA
1950	1"=500'	Flight Date: March 06, 1950	USDA
1948	1"=500'	Flight Date: April 25, 1948	USFS
1939	1"=500'	Flight Date: October 20, 1939	USDA

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INQUIRY #: 7396597.8
YEAR: 2020
= 500'
N
EDR

INQUIRY #: 7396597.8
YEAR: 2012
= 500'
N
EDR

INQUIRY #: 7396597.8
YEAR: 2009
= 500'
N
EDR

INQUIRY #: 7396597.8
YEAR: 2006
= 500'
N
EDR

INQUIRY #: 7396597.8

YEAR: 1998

= 500'

N

EDR

INQUIRY #: 7396597.8

YEAR: 1993

= 500'

N

EDR

INQUIRY #: 7396597.8

YEAR: 1982

= 500'

N

EDR

INQUIRY #: 7396597.8

YEAR: 1970

= 500'

N

EDR

INQUIRY #: 7396597.8

YEAR: 1968

= 500'

N

EDR

INQUIRY #: 7396597.8
YEAR: 1963
= 500'
N
EDR

INQUIRY #: 7396597.8
YEAR: 1956
= 500'
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EDR

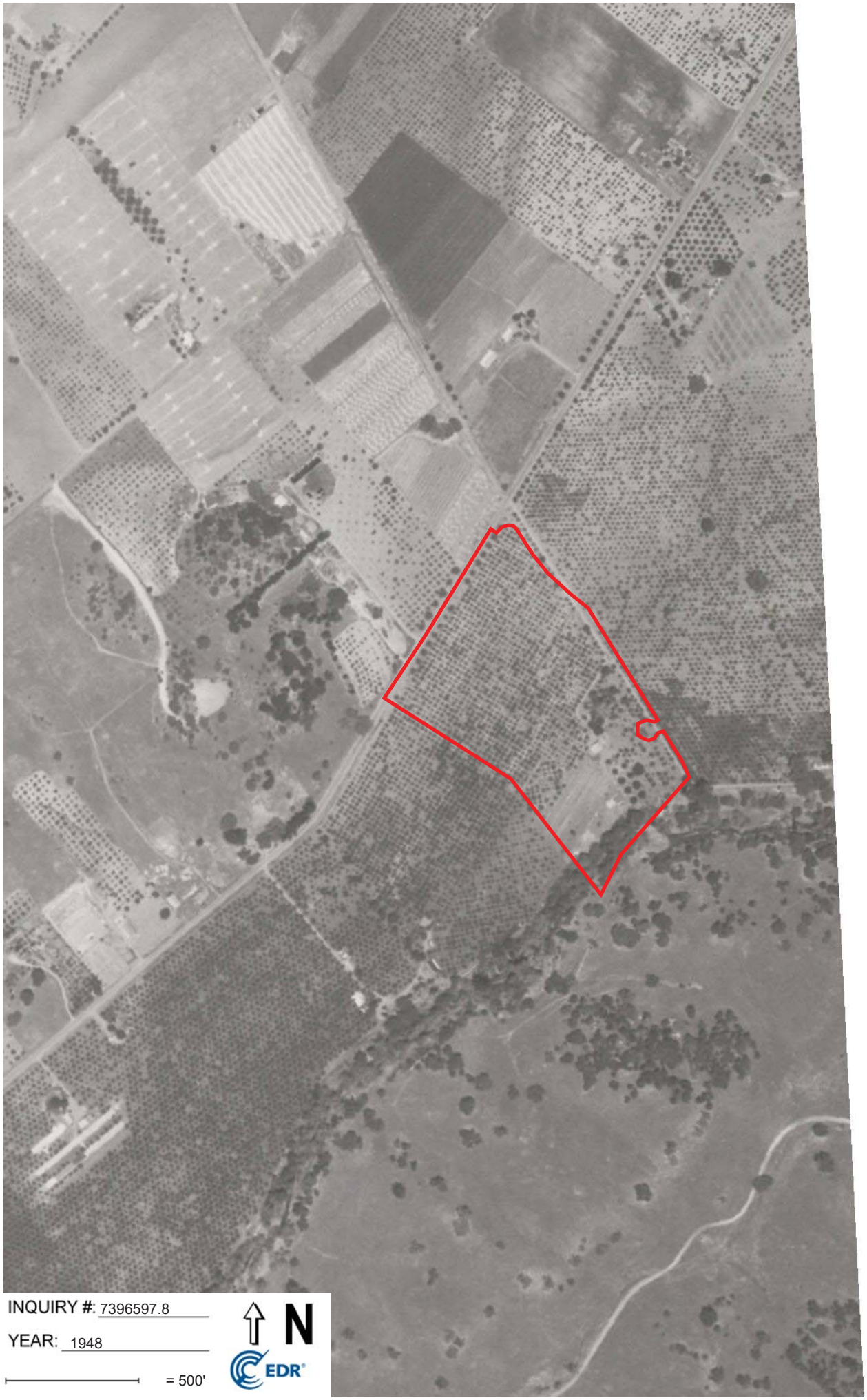
INQUIRY #: 7396597.8

YEAR: 1950

= 500'

N

EDR



INQUIRY #: 7396597.8

YEAR: 1948

= 500'

N

EDR

INQUIRY #: 7396597.8
YEAR: 1939
= 500'
N
EDR

2T325 14905 Santa Teresa Blvd

14905 Santa Teresa Blvd

Morgan Hill, CA 95037

Inquiry Number: 7396597.3

July 21, 2023

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

07/21/23

Site Name:

2T325 14905 Santa Teresa Blv
14905 Santa Teresa Blvd
Morgan Hill, CA 95037
EDR Inquiry # 7396597.3

Client Name:

Weber, Hayes, & Associates
120 Westgate Drive
Watsonville, CA 95076
Contact: Shaun Ersoy

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The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 4671-4416-B3EC

PO # 2T325

Project 2T325 14905 Santa Teresa Blvd

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 4671-4416-B3EC

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- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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2T325 14905 Santa Teresa Blvd
14905 Santa Teresa Blvd
Morgan Hill, CA 95037

Inquiry Number: 7396597.4
July 21, 2023

EDR Historical Topo Map Report
with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report 07/21/23

Site Name:	Client Name:
2T325 14905 Santa Teresa Blv	Weber, Hayes, & Associates
14905 Santa Teresa Blvd	120 Westgate Drive
Morgan Hill, CA 95037	Watsonville, CA 95076
EDR Inquiry # 7396597.4	Contact: Shaun Ersoy

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Weber, Hayes, & Associates were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	2T325	**Latitude:**	37.091909 37° 5' 31" North
Project:	2T325 14905 Santa Teresa Blv	**Longitude:**	-121.645893 -121° 38' 45" West
		UTM Zone:	Zone 10 North
		UTM X Meters:	620341.03
		UTM Y Meters:	4105925.94
		Elevation:	342.86' above sea level

Maps Provided:

2018	1939
2015	1917
2012	
1996	
1980, 1981	
1979	
1968	
1955	

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2018 Source Sheets

Mount Madonna
2018
7.5-minute, 24000

Gilroy
2018
7.5-minute, 24000

2015 Source Sheets

Mount Madonna
2015
7.5-minute, 24000

Gilroy
2015
7.5-minute, 24000

2012 Source Sheets

Mount Madonna
2012
7.5-minute, 24000

Gilroy
2012
7.5-minute, 24000

1996 Source Sheets

Mount Madonna
1996
7.5-minute, 24000
Aerial Photo Revised 1987

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1980, 1981 Source Sheets

Mt. Madonna
1980
7.5-minute, 24000
Aerial Photo Revised 1978

Gilroy
1981
7.5-minute, 24000
Aerial Photo Revised 1978

1979 Source Sheets

Mt. Madonna
1979
7.5-minute, 24000
Aerial Photo Revised 1979

1968 Source Sheets

Mt. Madonna
1968
7.5-minute, 24000
Aerial Photo Revised 1968

Gilroy
1968
7.5-minute, 24000
Aerial Photo Revised 1968

1955 Source Sheets

Gilroy
1955
7.5-minute, 24000
Aerial Photo Revised 1953

Mt. Madonna
1955
7.5-minute, 24000
Aerial Photo Revised 1953

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1939 Source Sheets

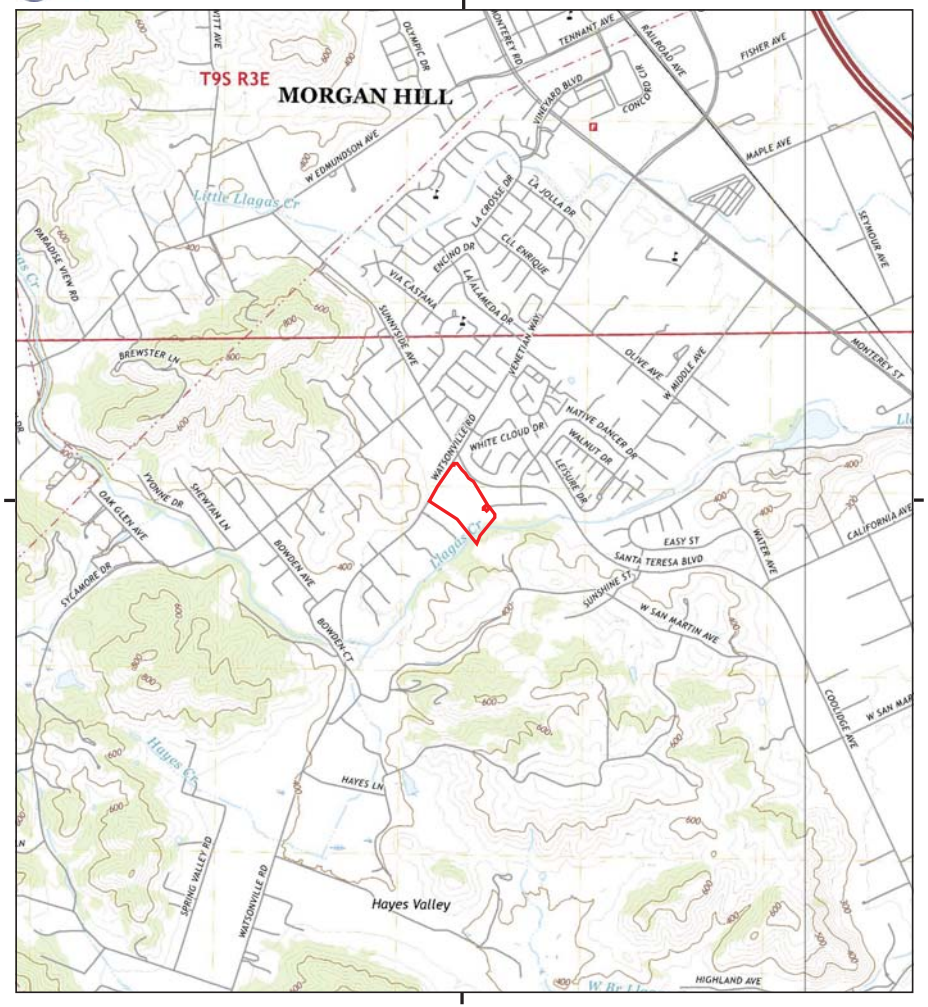
Morgan Hill
1939
15-minute, 62500
Aerial Photo Revised 1939

1917 Source Sheets

Morgan Hill
1917
15-minute, 62500

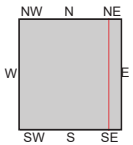
Historical Topo Map

2018



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



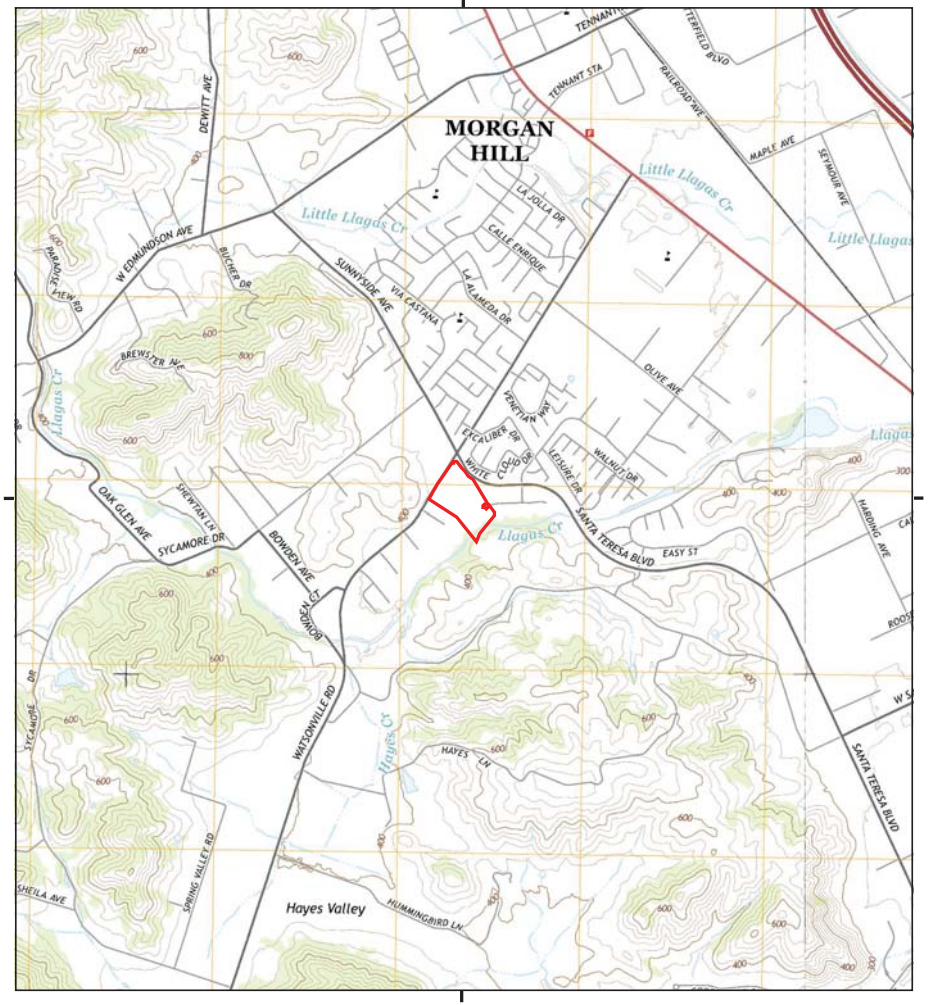
TP, Mount Madonna, 2018, 7.5-minute
SE, Gilroy, 2018, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

EDR

Historical Topo Map

2015



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Mount Madonna, 2015, 7.5-minute
SE, Gilroy, 2015, 7.5-minute

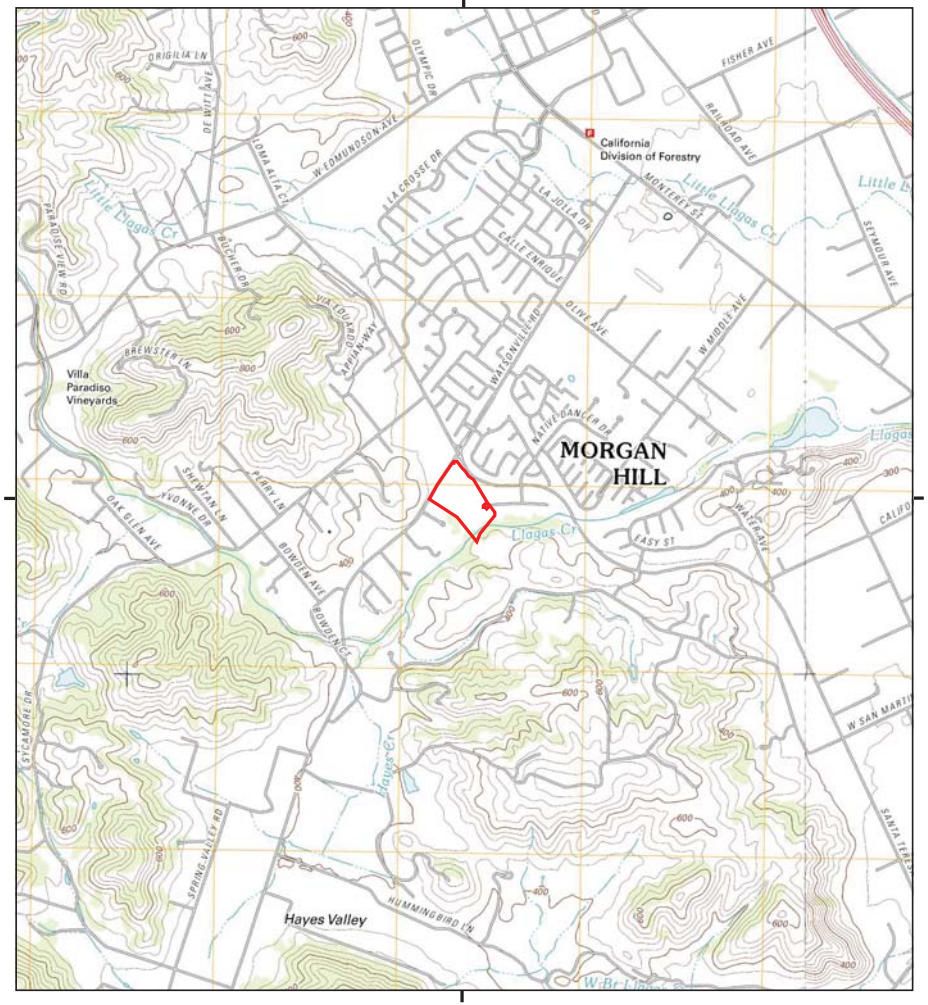
SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

N

EDR

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

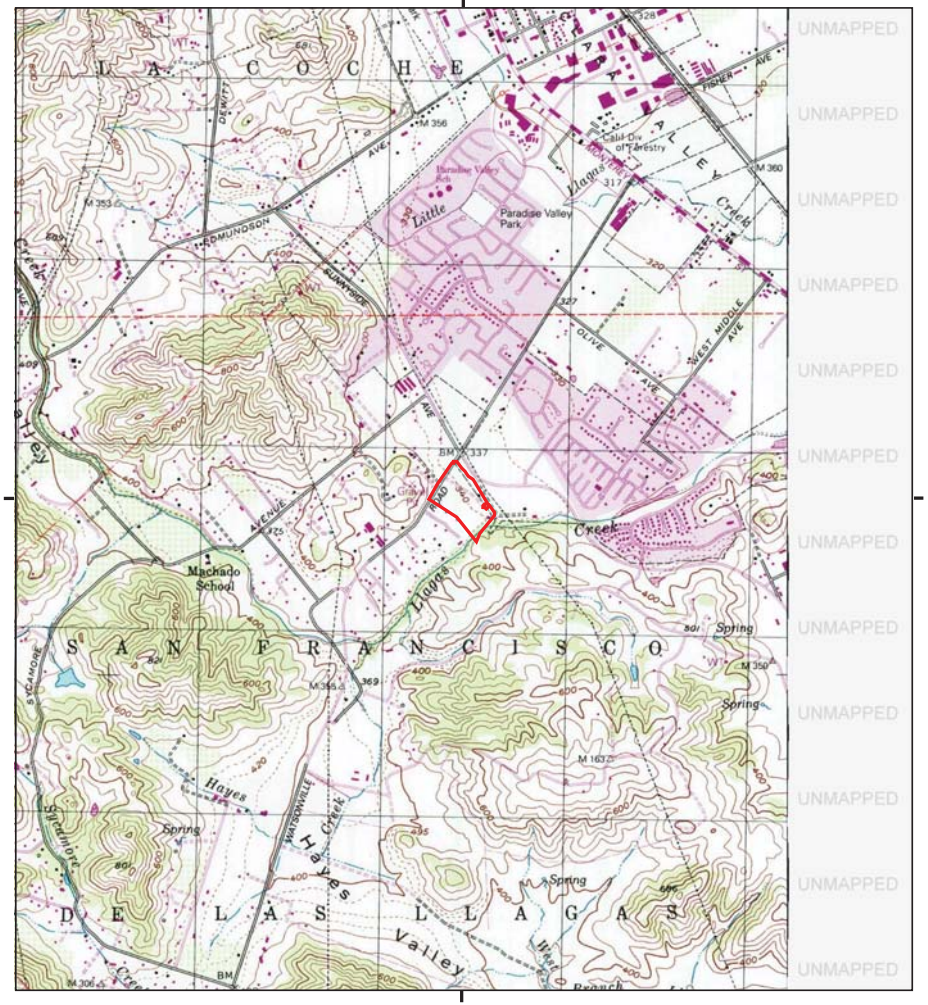
TP, Mount Madonna, 2012, 7.5-minute
SE, Gilroy, 2012, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

N

Historical Topo Map

1996



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Mount Madonna, 1996, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

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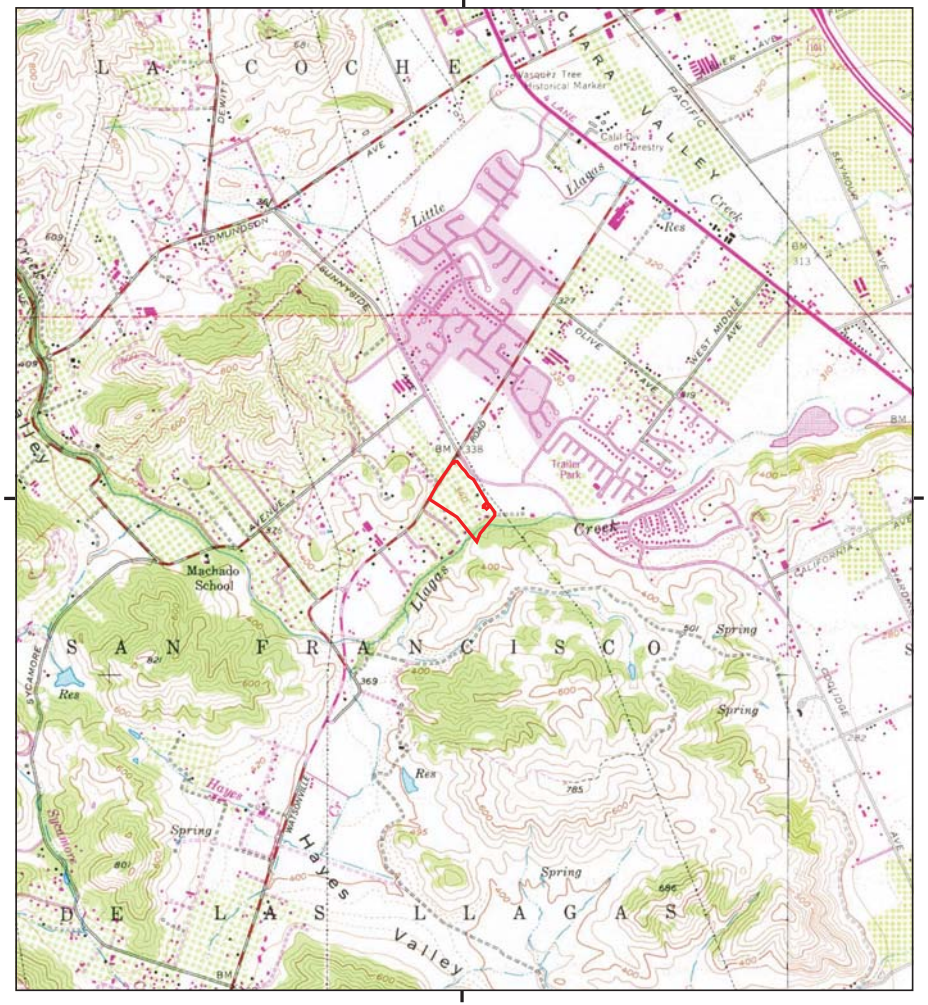
Historical Topo Map

1980, 1981



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Mt. Madonna, 1980, 7.5-minute
SE, Gilroy, 1981, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

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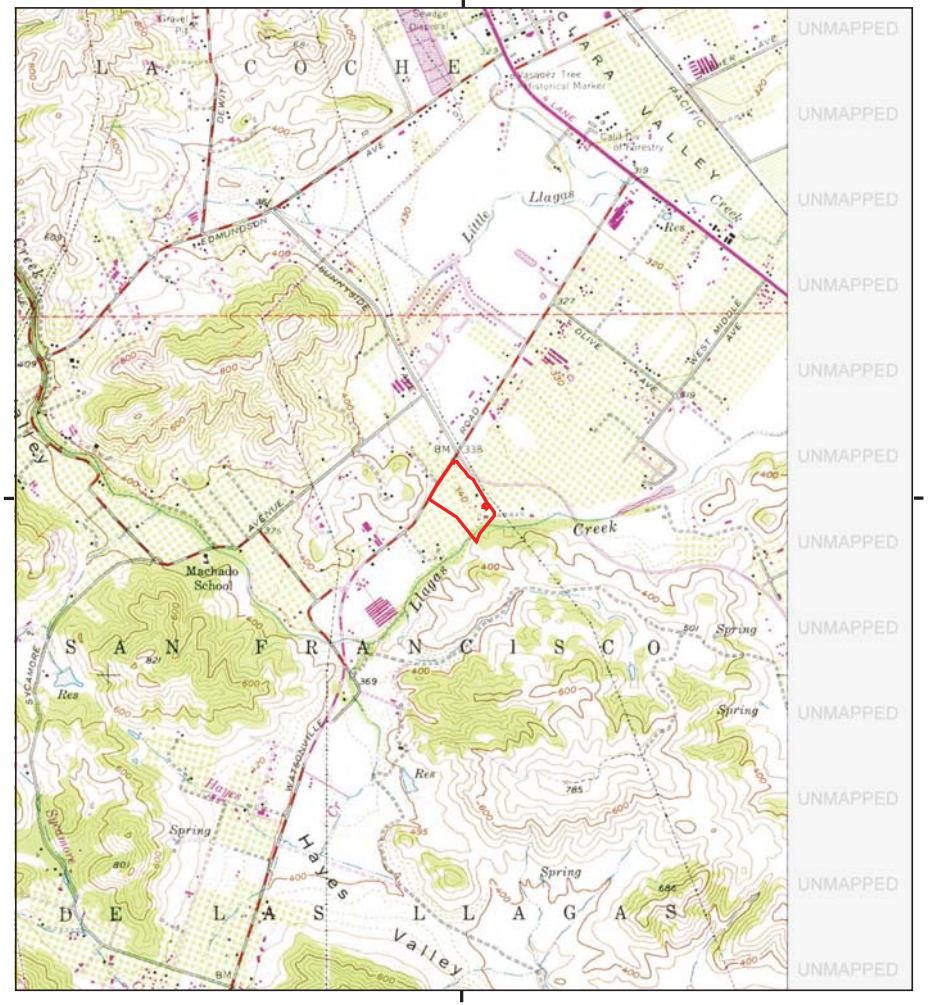
Historical Topo Map

1979



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Mt. Madonna, 1979, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

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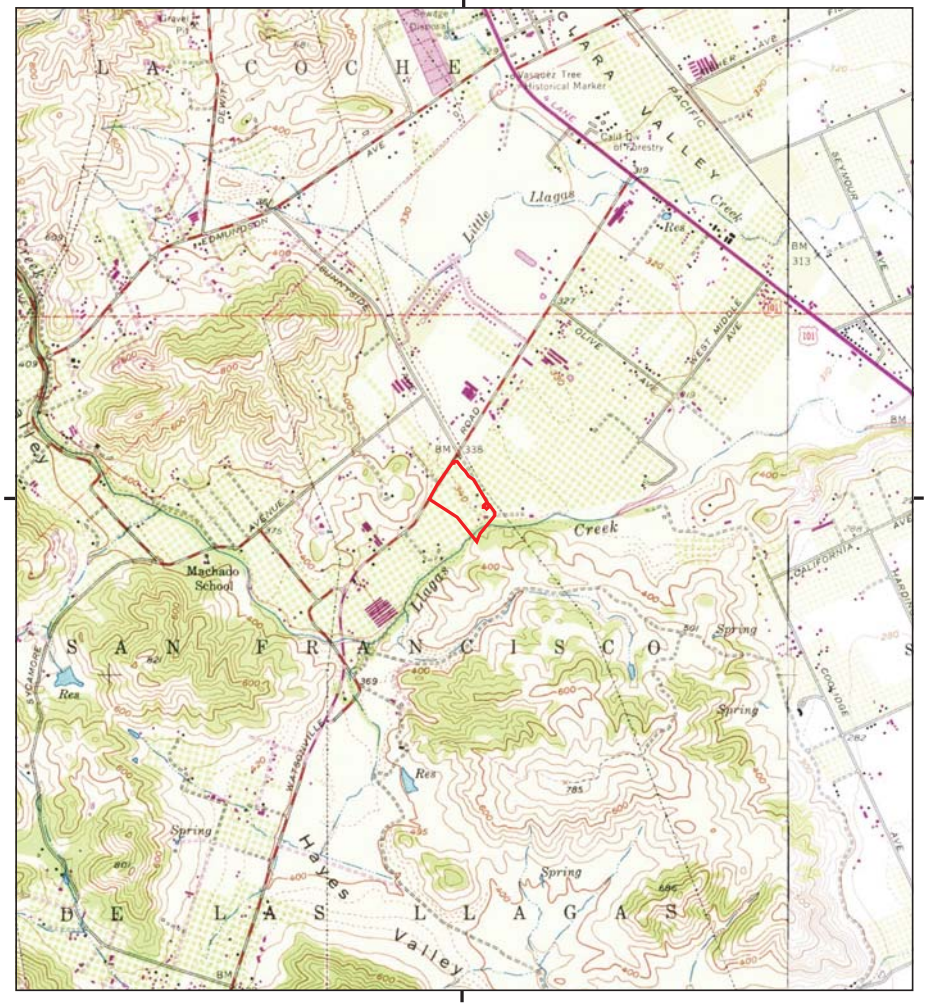
Historical Topo Map

1968



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Mt. Madonna, 1968, 7.5-minute
SE, Gilroy, 1968, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

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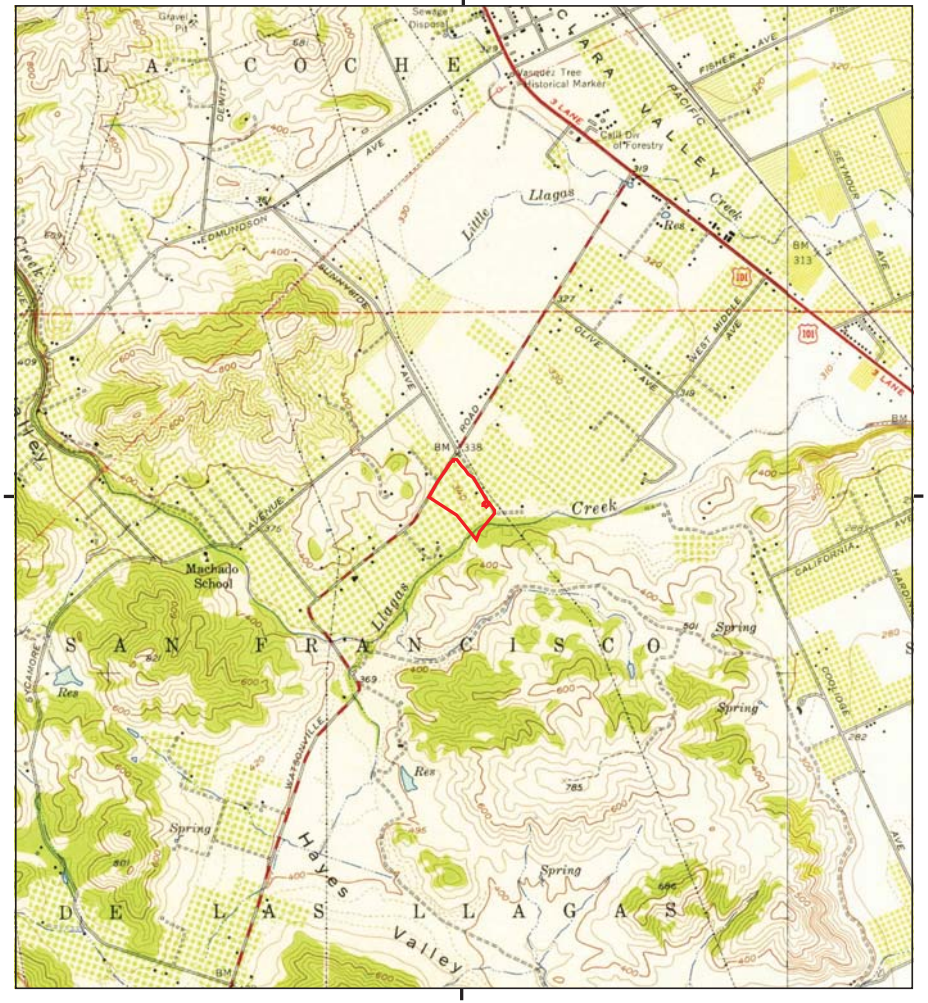
Historical Topo Map

1955



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Mt. Madonna, 1955, 7.5-minute
SE, Gilroy, 1955, 7.5-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

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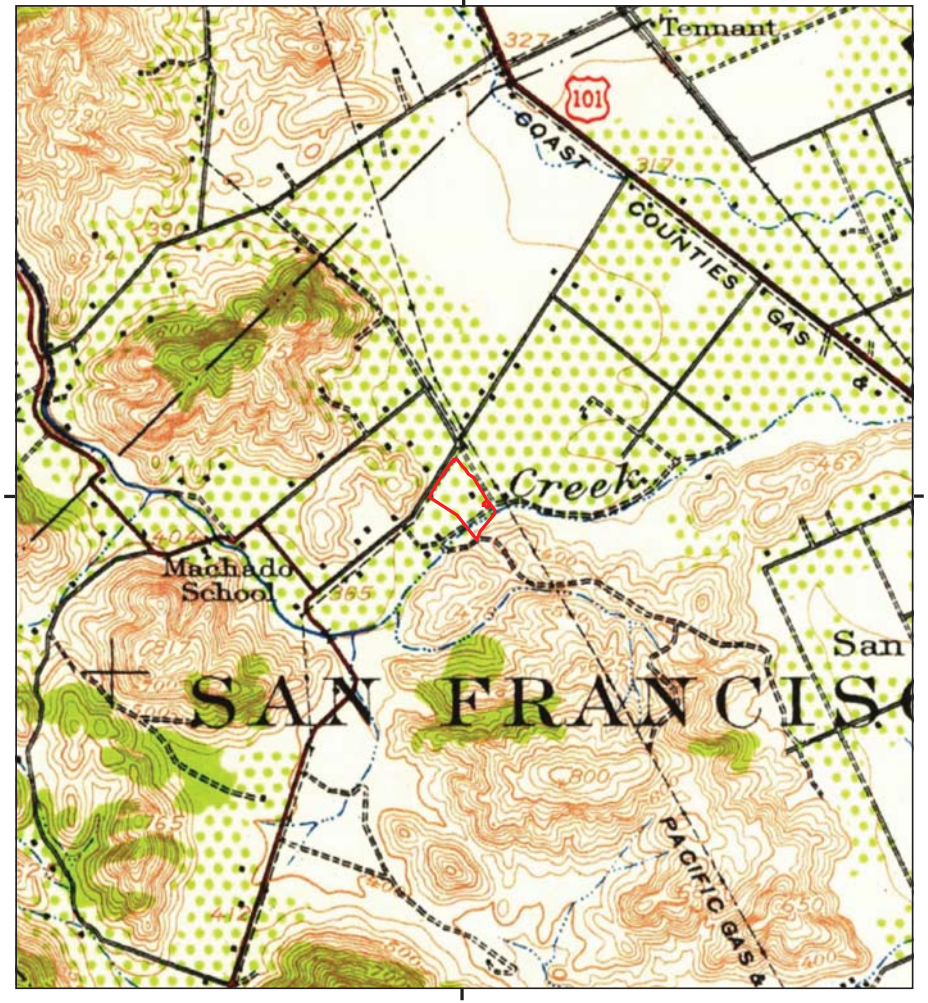
Historical Topo Map

1939



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Morgan Hill, 1939, 15-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

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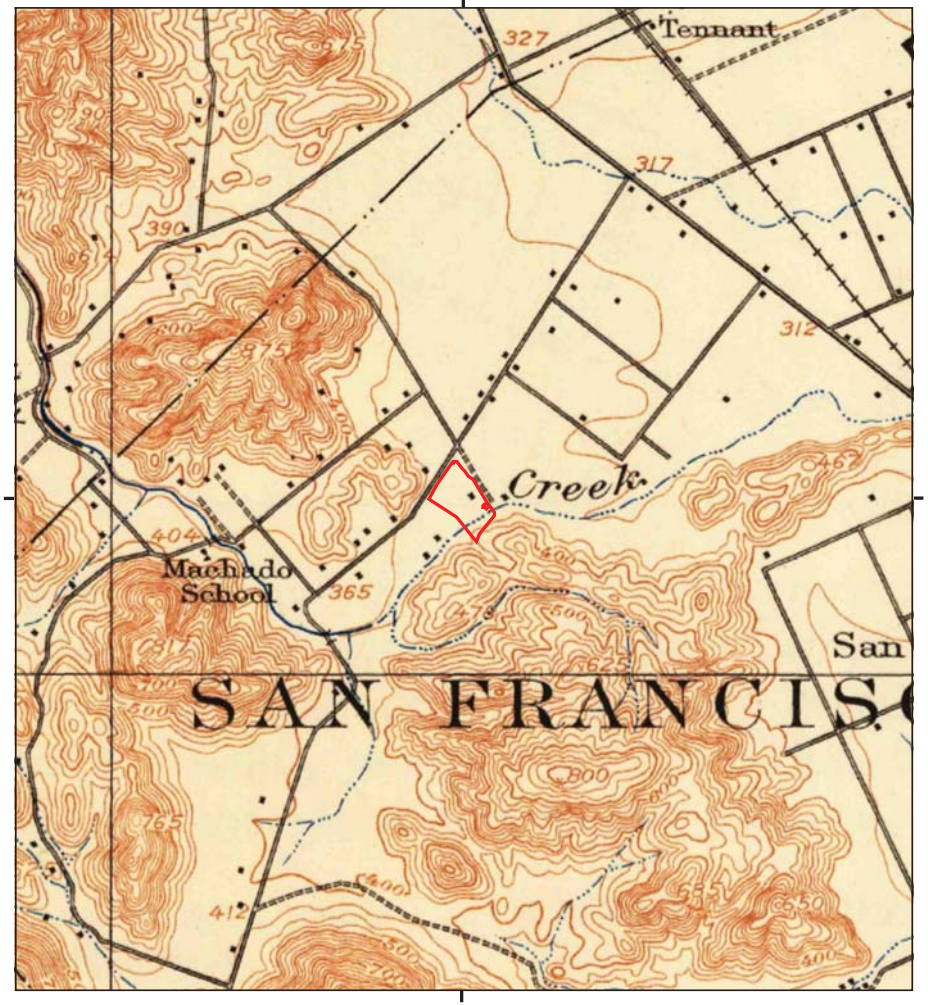
EDR

Historical Topo Map

1917



0 Miles 0.25 0.5 1 1.5

This report includes information from the following map sheet(s).

NW N NE
W E
SW S SE

TP, Morgan Hill, 1917, 15-minute

SITE NAME: 2T325 14905 Santa Teresa Blvd
ADDRESS: 14905 Santa Teresa Blvd
Morgan Hill, CA 95037
CLIENT: Weber, Hayes, & Associates

N

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APPENDIX C

EDR RADIUS REPORT
(Database Report of Regulated Sites)

2T325 14905 Santa Teresa Blvd
14905 Santa Teresa Blvd
Morgan Hill, CA 95037

Inquiry Number: 7396597.2s
July 21, 2023

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

FORM-EBC-TFS

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Detail Map	3
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Map Findings	9
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Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-15
Physical Setting Source Map Findings	A-17
Physical Setting Source Records Searched	PSGR-1

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

14905 SANTA TERESA BLVD
MORGAN HILL, CA 95037

COORDINATES

Latitude (North):	37.0919090 - 37˚ 5' 30.87''
Longitude (West):	121.6458930 - 121˚ 38' 45.21''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	620343.9
UTM Y (Meters):	4105722.5
Elevation:	343 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	12008752 MOUNT MADONNA, CA
Version Date:	2018
Southeast Map:	12008710 GILROY, CA
Version Date:	2018

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20200527
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
14905 SANTA TERESA BLVD
MORGAN HILL, CA 95037

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	RUTH JONES RESIDENCE	14905 SANTA THERESA	LUST, HIST LUST, Cortese, HIST CORTESE, CERS		TP
A2	RUTH JONES RESIDENCE	14905 SANTA TERESA B	FINDS		TP
A3	RUTH JONES RESIDENCE	14905 SANTA THERESA	RGA LUST		TP
A4	JOHN W. JONES	14905 SANTA TERESA B	LUST, HIST UST		TP
A5	CHERI SCALES	14905 SANTA TERESA R	HWTS		TP
A6	RUTH JONES RESIDENCE	14905 SANTA TERESA B	RGA LUST		TP
A7	JONES CHRISTMAS TREE	14905 SANTA TERESA R	HAZNET, HWTS		TP
B8	RIST QUARRY	14905 WATSONVILLE	LUST, Cortese, HIST CORTESE, CERS	Higher	116, 0.022, West
B9	RIST QUARRY	14905 WATSONVILLE RD	LUST, HIST LUST	Higher	116, 0.022, West
10	SPRINT PCS-SF54XC407	15065 SUNNYSIDE AV	HIST UST, CUPA Listings, CERS	Lower	499, 0.095, NNW
11	ROGER KNOPF	14692 KNOPF COURT	LUST, HIST UST, Cortese, HIST CORTESE, CERS	Higher	1433, 0.271, SW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 9 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
RUTH JONES RESIDENCE 14905 SANTA THERESA MORGAN HILL, CA 95037	LUST Database: LUST REG 3, Date of Government Version: 05/19/2003 Status: Case Closed Global ID: T0608500045 HIST LUST SCVWD ID: 10S3E04K01 Cortese Cleanup Status: COMPLETED - CASE CLOSED HIST CORTESE Reg Id: 2880 CERS	N/A
RUTH JONES RESIDENCE 14905 SANTA TERESA B MORGAN HILL, CA 95037	FINDS Registry ID:: 110065899745	N/A
RUTH JONES RESIDENCE 14905 SANTA THERESA MORGAN HILL, CA	RGA LUST	N/A
JOHN W. JONES 14905 SANTA TERESA B MORGAN HILL, CA 95037	LUST Database: LUST SANTA CLARA, Date of Government Version: 03/03/2014 Database: LUST, Date of Government Version: 03/06/2023 Status: Completed - Case Closed Date Closed: 01/09/2001 Global Id: T0608591843 SCVWD ID: 10S3E04K01F HIST UST Facility Id: 00000049662	N/A
CHERI SCALES 14905 SANTA TERESA R MORGAN HILL, CA 95037	HWTS	N/A
RUTH JONES RESIDENCE 14905 SANTA TERESA B MORGAN HILL, CA	RGA LUST	N/A
JONES CHRISTMAS TREE 14905 SANTA TERESA R MORGAN HILL, CA 95037	HAZNET GEPAID: CAC001303720 HWTS	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL ---- National Priority List
Proposed NPL ---- Proposed National Priority List Sites
NPL LIENS ---- Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL ---- National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY ---- Federal Facility Site Information listing
SEMS ---- Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE ---- Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS ---- Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF ---- RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG ---- RCRA - Large Quantity Generators
RCRA-SQG ---- RCRA - Small Quantity Generators
RCRA-VSQG ---- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---- Land Use Control Information System
US ENG CONTROLS ---- Engineering Controls Sites List
US INST CONTROLS ---- Institutional Controls Sites List

Federal ERNS list

ERNS ---- Emergency Response Notification System

Lists of state- and tribal (Superfund) equivalent sites

RESPONSE ..... State Response Sites

Lists of state- and tribal hazardous waste facilities

ENVIROSTOR ..... EnviroStor Database

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF ..... Solid Waste Information System

Lists of state and tribal leaking storage tanks

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land
CPS-SLIC ..... Statewide SLIC Cases

Lists of state and tribal registered storage tanks

FEMA UST ..... Underground Storage Tank Listing
UST ..... Active UST Facilities
AST ..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST ..... Underground Storage Tanks on Indian Land

Lists of state and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing
VCP ..... Voluntary Cleanup Program Properties

Lists of state and tribal brownfield sites

BROWNFIELDS ..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ..... Waste Management Unit Database
SWRCY ..... Recycler Database
HAULERS ..... Registered Waste Tire Haulers Listing
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
IHS OPEN DUMPS ..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ..... Delisted National Clandestine Laboratory Register
HIST Cal-Sites ..... Historical Calsites Database

SCH ..... School Property Evaluation Program
CDL ..... Clandestine Drug Labs
CERS HAZ WASTE ..... CERS HAZ WASTE
Toxic Pits ..... Toxic Pits Cleanup Act Sites
US CDL ..... National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

SWEEPS UST ..... SWEEPS UST Listing
CA FID UST ..... Facility Inventory Database
CERS TANKS ..... California Environmental Reporting System (CERS) Tanks

Local Land Records

LIENS ..... Environmental Liens Listing
LIENS 2 ..... CERCLA Lien Information
DEED ..... Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
CHMIRS ..... California Hazardous Material Incident Report System
LDS ..... Land Disposal Sites Listing
MCS ..... Military Cleanup Sites Listing
SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ..... RCRA - Non Generators / No Longer Regulated
FUDS ..... Formerly Used Defense Sites
DOD ..... Department of Defense Sites
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties
PADS ..... PCB Activity Database System
ICIS ..... Integrated Compliance Information System
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ..... Material Licensing Tracking System
COAL ASH DOE ..... Steam-Electric Plant Operation Data
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ..... PCB Transformer Registration Database
RADINFO ..... Radiation Information Database
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ..... Incident and Accident Data
CONSENT ..... Superfund (CERCLA) Consent Decrees
INDIAN RESERV ..... Indian Reservations

FUSRAP Formerly Utilized Sites Remedial Action Program
UMTRA Uranium Mill Tailings Sites
LEAD SMELTERS Lead Smelter Sites
US AIRS Aerometric Information Retrieval System Facility Subsystem
US MINES Mines Master Index File
ABANDONED MINES Abandoned Mines
UXO Unexploded Ordnance Sites
ECHO Enforcement & Compliance History Information
DOCKET HWC Hazardous Waste Compliance Docket Listing
FUELS PROGRAM EPA Fuels Program Registered Listing
PFAS NPL Superfund Sites with PFAS Detections Information
PFAS FEDERAL SITES Federal Sites PFAS Information
PFAS TSCA PFAS Manufacture and Imports Information
PFAS RCRA MANIFEST PFAS Transfers Identified In the RCRA Database Listing
PFAS ATSDR PFAS Contamination Site Location Listing
PFAS WQP Ambient Environmental Sampling for PFAS
PFAS NPDES Clean Water Act Discharge Monitoring Information
PFAS ECHO Facilities in Industries that May Be Handling PFAS Listing
PFAS ECHO FIRE TRAINING Facilities in Industries that May Be Handling PFAS Listing
PFAS PART 139 AIRPORT All Certified Part 139 Airports PFAS Information Listing
AQUEOUS FOAM NRC Aqueous Foam Related Incidents Listing
PFAS PFAS Contamination Site Location Listing
AQUEOUS FOAM Former Fire Training Facility Assessments Listing
CA BOND EXP. PLAN Bond Expenditure Plan
DRYCLEANERS Cleaner Facilities
EMI Emissions Inventory Data
ENF Enforcement Action Listing
Financial Assurance Financial Assurance Information Listing
ICE ICE
HWP EnviroStor Permitted Facilities Listing
HWT Registered Hazardous Waste Transporter Database
MINES Mines Site Location Listing
MWMP Medical Waste Management Program Listing
NPDES NPDES Permits Listing
PEST LIC Pesticide Regulation Licenses Listing
PROC Certified Processors Database
Notify 65 Proposition 65 Records
HAZMAT Hazardous Material Facilities
UIC UIC Listing
UIC GEO UIC GEO (GEOTRACKER)
WASTEWATER PITS Oil Wastewater Pits Listing
WDS Waste Discharge System
WIP Well Investigation Program Case List
MILITARY PRIV SITES MILITARY PRIV SITES (GEOTRACKER)
PROJECT PROJECT (GEOTRACKER)
WDR Waste Discharge Requirements Listing
CIWQS California Integrated Water Quality System
NON-CASE INFO NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ Well Stimulation Project (GEOTRACKER)
MINES MRDS Mineral Resources Data System
PFAS TRIS List of PFAS Added to the TRI

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants

EDR Hist Auto ---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---------- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---------- Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of state and tribal leaking storage tanks

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 3 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIST QUARRY	***14905 WATSONVILLE***	***W 0 - 1/8 (0.022 mi.)***	***B8***	***17***
Database: LUST SANTA CLARA, Date of Government Version: 03/03/2014				
Database: LUST, Date of Government Version: 03/06/2023				
Status: Completed - Case Closed				
Date Closed: 04/02/1996				
Global Id: T0608539262				
SCVWD ID: 10S3E04L01F				
RIST QUARRY	***14905 WATSONVILLE RD***	***W 0 - 1/8 (0.022 mi.)***	***B9***	***19***
Database: LUST REG 3, Date of Government Version: 05/19/2003				
Status: Case Closed				
Global ID: T0608539262				
ROGER KNOPF	***14692 KNOPF COURT***	***SW 1/4 - 1/2 (0.271 mi.)***	***11***	***23***
Database: LUST REG 3, Date of Government Version: 05/19/2003				
Database: LUST, Date of Government Version: 03/06/2023				
Status: Completed - Case Closed				
Status: Case Closed				

Global Id: T0608500062
Global ID: T0608500062

HIST LUST: A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

A review of the HIST LUST list, as provided by EDR, and dated 03/29/2005 has revealed that there is 1 HIST LUST site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIST QUARRY	***14905 WATSONVILLE RD***	***W 0 - 1/8 (0.022 mi.)***	***B9***	***19***
SCVWD ID: 10S3E04L01				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SPRINT PCS-SF54XC407	***15065 SUNNYSIDE AV***	***NNW 0 - 1/8 (0.095 mi.)***	***10***	***21***
Facility Id: 00000048471				

Other Ascertainable Records

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 03/20/2023 has revealed that there are 2 Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIST QUARRY	***14905 WATSONVILLE***	***W 0 - 1/8 (0.022 mi.)***	***B8***	***17***
Cleanup Status: COMPLETED - CASE CLOSED				
ROGER KNOPF	***14692 KNOPF COURT***	***SW 1/4 - 1/2 (0.271 mi.)***	***11***	***23***
Cleanup Status: COMPLETED - CASE CLOSED				

CUPA Listings: A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

A review of the CUPA Listings list, as provided by EDR, has revealed that there is 1 CUPA Listings site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SPRINT PCS-SF54XC407	***15065 SUNNYSIDE AV***	***NNW 0 - 1/8 (0.095 mi.)***	***10***	***21***
Database: CUPA SANTA CLARA, Date of Government Version: 02/10/2023				

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the target property.

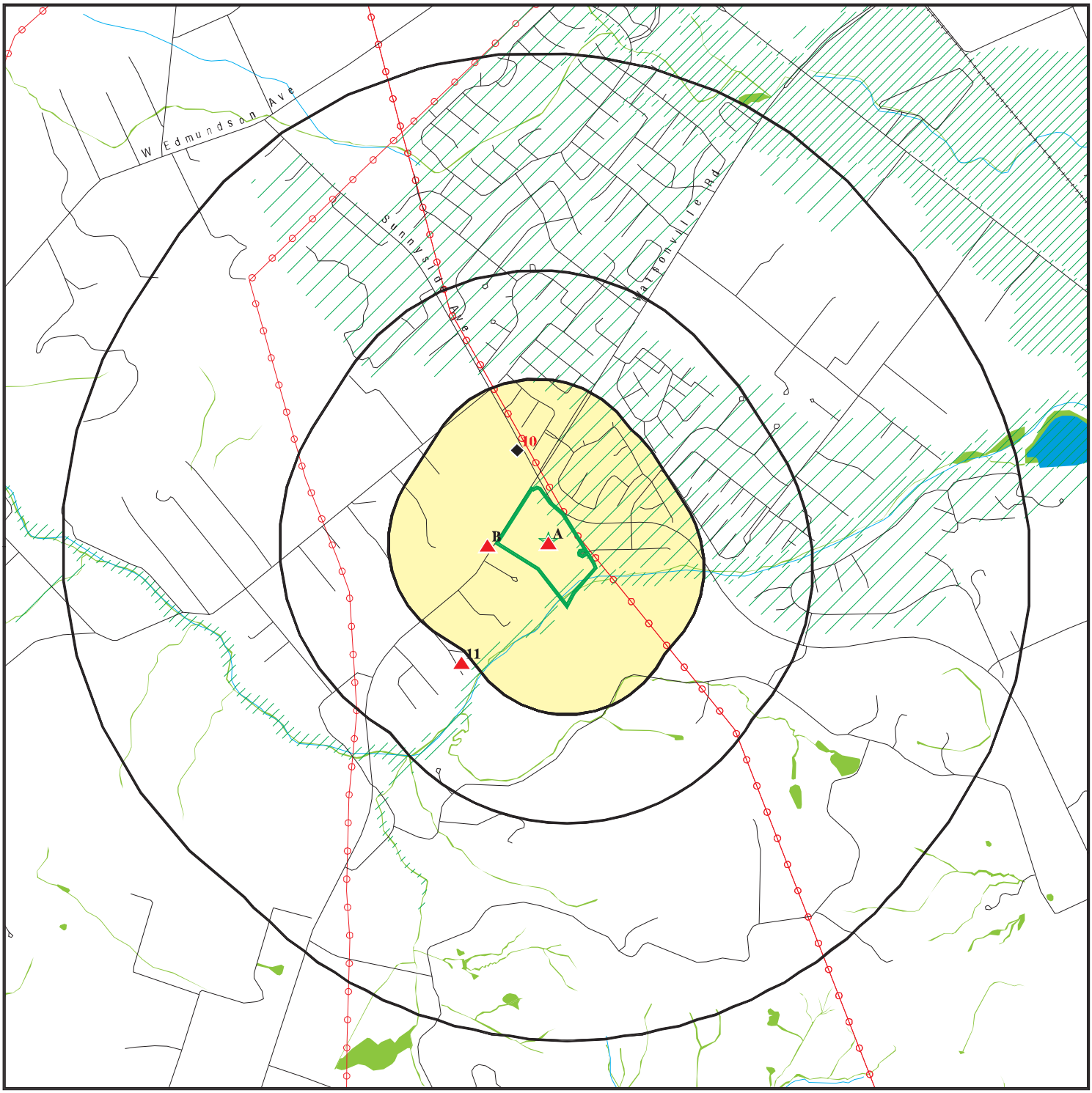
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIST QUARRY	***14905 WATSONVILLE***	***W 0 - 1/8 (0.022 mi.)***	***B8***	***17***
Reg Id: 728				
ROGER KNOPF	***14692 KNOPF COURT***	***SW 1/4 - 1/2 (0.271 mi.)***	***11***	***23***
Reg Id: 321				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
FORMER WHITE GASOLINE	LUST

OVERVIEW MAP - 7396597.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	2T325 14905 Santa Teresa Blvd	CLIENT:	Weber, Hayes, & Associates
ADDRESS:	14905 Santa Teresa Blvd Morgan Hill CA 95037	CONTACT:	Shaun Ersoy
		INQUIRY #:	7396597.2s
LAT/LONG:	37.091909 / 121.645893	DATE:	July 21, 2023 4:29 pm

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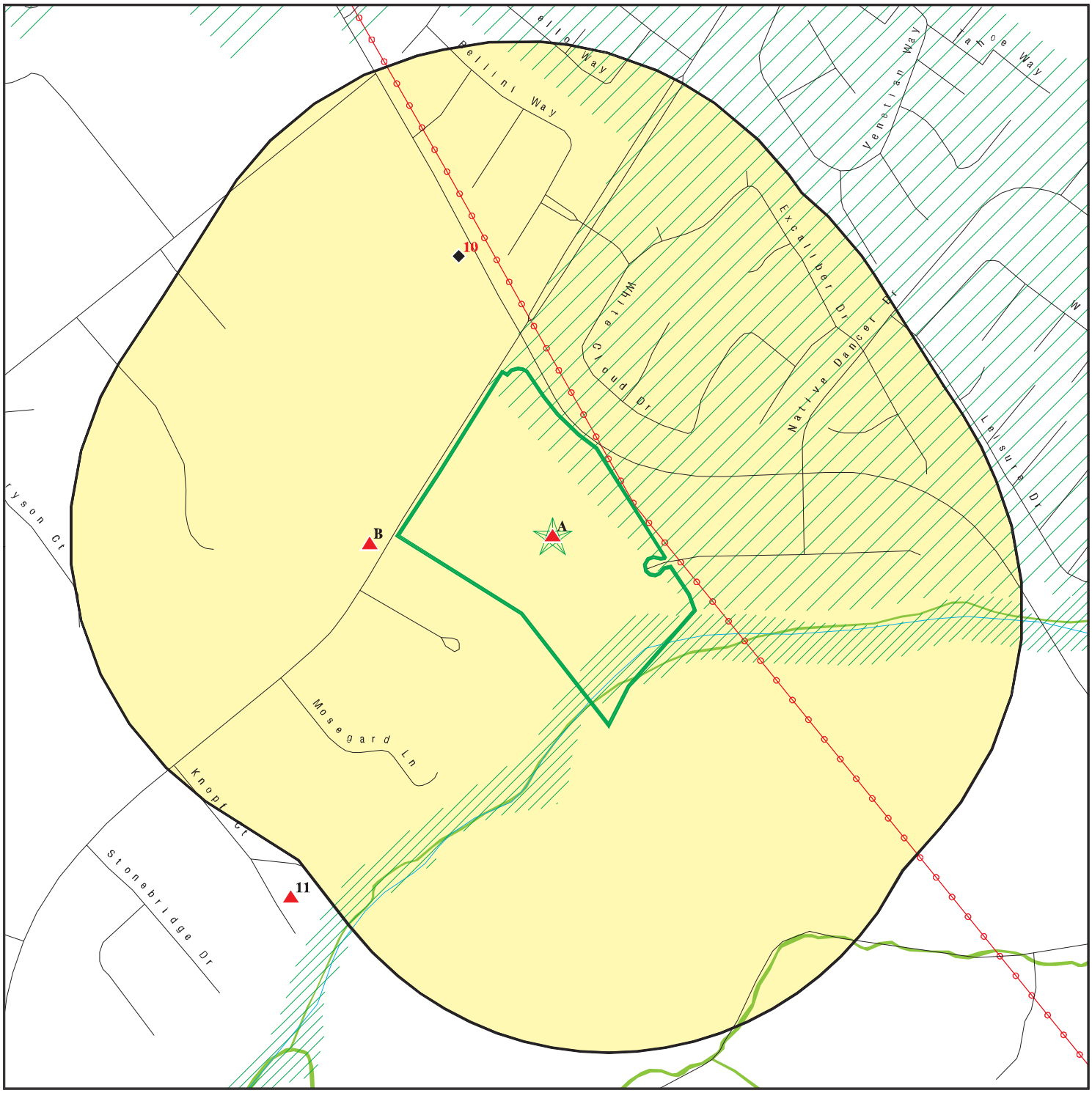
DETAIL MAP - 7396597.2S



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA
Power transmission lines
Special Flood Hazard Area (1%)
0.2% Annual Chance Flood Hazard
National Wetland Inventory
State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 2T325 14905 Santa Teresa Blvd	CLIENT: Weber, Hayes, & Associates
ADDRESS: 14905 Santa Teresa Blvd Morgan Hill CA 95037	CONTACT: Shaun Ersoy INQUIRY #: 7396597.2s
LAT/LONG: 37.091909 / 121.645893	DATE: July 21, 2023 4:30 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
Lists of state- and tribal (Superfund) equivalent sites								
RESPONSE	1.000		0	0	0	0	NR	0
Lists of state- and tribal hazardous waste facilities								
ENVIROSTOR	1.000		0	0	0	0	NR	0
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Lists of state and tribal leaking storage tanks								
LUST	0.500	2	2	0	1	NR	NR	5
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
HIST LUST	0.500	1	1	0	0	NR	NR	2
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250	1	1	0	NR	NR	NR	2
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001	1	0	NR	NR	NR	NR	1
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		0	0	NR	NR	NR	0
PFAS ECHO FIRE TRAINING	0.250		0	0	NR	NR	NR	0
PFAS PART 139 AIRPORT	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500	1	1	0	1	NR	NR	3
CUPA Listings	0.250		1	0	NR	NR	NR	1
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500	1	1	0	1	NR	NR	3
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HAZNET	0.001	1	0	NR	NR	NR	NR	1
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
HAZMAT	0.250		0	0	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001	1	0	NR	NR	NR	NR	1
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
HWTS	TP	2	NR	NR	NR	NR	NR	2
MINES MRDS	0.001		0	NR	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001	2	0	NR	NR	NR	NR	2
- Totals --		13	7	0	3	0	0	23

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **RUTH JONES RESIDENCE** **LUST** **S102686549**
Target **14905 SANTA THERESA** **HIST LUST** **N/A**
Property **MORGAN HILL, CA 95037** **Cortese**
HIST CORTESE
Site 1 of 7 in cluster A **CERS**

Actual: **343 ft.**

LUST REG 3:

Region:	3
Regional Board:	Central Coast Region
Facility County:	Santa Clara
Global ID:	T0608500045
Status:	Case Closed
Case Number:	2880
Local Case Num:	10S3E04K01f
Case Type:	W
Substance:	Gasoline
Quantity:	Not reported
Abatement Method:	Not reported
Leak Source:	Not reported
Leak Cause:	Not reported
How Stopped:	Not reported
How Discovered:	Not reported
Release Date:	07/29/1997
Discovered Date:	Not reported
Enter Date:	/ /
Stop Date:	Not reported
Review Date:	/ /
Enforce Date:	Not reported
Close Date:	1/9/01
Enforcement Type:	SEL
Responsible Party:	Not reported
RP Address:	Not reported
Contact:	Not reported
Cross Street:	Not reported
Local Agency:	43099L
Lead Agency:	Local Agency
Staff Initials:	AJM
Confirm Leak:	Not reported
Workplan:	Not reported
Prelim Assess:	3/5/97
Pollution Char:	07/23/1997
Remedial Plan:	Not reported
Remedial Action:	Not reported
Monitoring:	09/10/1999
Pilot Program:	LUST
Interim Action:	Not reported
Funding:	Not reported
MTBE Class:	Not reported
Max MTBE Grnd Wtr:	50
Max MTBE Soil:	.03
Max MTBE Data:	09/08/2000
MTBE Tested:	YES
Lat/Long:	37.0927505 / -121.646225
Soil Qualifier:	=
Grnd Wtr Qualifier:	=
Mtbe Concentratn:	2
Mtbe Fuel:	1
Org Name:	Not reported
Basin Plan:	Not reported

RUTH JONES RESIDENCE (Continued) **S102686549**

Beneficial:	MUN
Priority:	Not reported
UST Cleanup Fund ID:	Not reported
Suspended:	Not reported
Operator:	Not reported
Water System:	STONEBRIDGE MUTUAL WATER CO
Well Name:	WELL 01
Distance From Well:	0
Assigned Name:	10S/03E-04N03 M
Summary:	Not reported

HIST LUST SANTA CLARA:

Name:	Ruth Jones Residence
Address:	14905 Santa Teresa Blvd
City:	Morgan Hill
Region:	SANTA CLARA
Region Code:	3
SCVWD ID:	10S3E04K01
Oversite Agency:	SCVWD
Date Listed:	1997-08-15 00:00:00
Closed Date:	2001-01-09 00:00:00

CORTESE:

Name:	RUTH JONES RESIDENCE
Address:	14905 SANTA TERESA BLVD
City,State,Zip:	MORGAN HILL, CA 95037
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0608591843
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

HIST CORTESE:

edr_fname:	RUTH JONES RESIDENCE
edr_fadd1:	14905 SANTA THERESA
City,State,Zip:	MORGAN HILL, CA 95037
Region:	CORTESE
Facility County Code:	43
Reg By:	LTNKA
Reg Id:	2880

RUTH JONES RESIDENCE (Continued) **S102686549**

CERS:
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City,State,Zip: MORGAN HILL, CA 95037
Site ID: 681298
CERS ID: T0608591843
CERS Description: Leaking Underground Storage Tank Cleanup Site

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A2 **RUTH JONES RESIDENCE** **FINDS** **1023298070**
Target **14905 SANTA TERESA BLVD** **N/A**
Property **MORGAN HILL, CA 95037**

Site 2 of 7 in cluster A

Actual: 343 ft.

FINDS:
Registry ID: 110065899745

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

A3 **RUTH JONES RESIDENCE** **RGA LUST** **S114679341**
Target **14905 SANTA THERESA RD** **N/A**
Property **MORGAN HILL, CA**

Site 3 of 7 in cluster A

Actual: 343 ft.

RGA LUST:
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA THERESA RD
City: MORGAN HILL
State: MORGAN HILL
2003 RUTH JONES RESIDENCE 14905 SANTA THERESA RD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA THERESA RD
City: MORGAN HILL
State: MORGAN HILL
2002 RUTH JONES RESIDENCE 14905 SANTA THERESA RD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA THERESA RD
City: MORGAN HILL
State: MORGAN HILL
2001 RUTH JONES RESIDENCE 14905 SANTA THERESA RD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA THERESA RD
City: MORGAN HILL
State: MORGAN HILL
2000 RUTH JONES RESIDENCE 14905 SANTA THERESA RD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA THERESA RD
City: MORGAN HILL
State: MORGAN HILL
1998 RUTH JONES RESIDENCE 14905 SANTA THERESA RD

RUTH JONES RESIDENCE (Continued) **S114679341**

Name: RUTH JONES RESIDENCE
Address: 14905 SANTA THERESA RD
City: MORGAN HILL
State: MORGAN HILL
1997 RUTH JONES RESIDENCE 14905 SANTA THERESA RD

A4 **JOHN W. JONES** **LUST** **U001601568**
Target **14905 SANTA TERESA BLVD** **HIST UST** **N/A**
Property **MORGAN HILL, CA 95037**

Site 4 of 7 in cluster A

Actual: 343 ft.

LUST:
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City,State,Zip: MORGAN HILL, CA 95037
Lead Agency: SANTA CLARA COUNTY LOP
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608591843
Global Id: T0608591843
Latitude: 37.092028
Longitude: -121.645992
Status: Completed - Case Closed
Status Date: 01/09/2001
Case Worker: Not reported
RB Case Number: Not reported
Local Agency: Not reported
File Location: Not reported
Local Case Number: Not reported
Potential Media Affect: Not reported
Potential Contaminants of Concern: Gasoline
EPA Region: 9
Coordinate Source: Google Geocode
Cuf Case: NO
Quantity Released Gallons: Not reported
Begin Date: 03/05/1997
Leak Reported Date: 01/02/1965
How Discovered: Not reported
How Discovered Description: Not reported
Discharge Source: Not reported
Discharge Cause: Not reported
Stop Method: Not reported
Stop Description: Not reported
No Further Action Date: 01/09/2001
CA Water Watershed Name: Pajaro River - South Santa Clara Valley (305.30)
Dwr Groundwater Subbasin Name: Gilroy-Hollister Valley - Llagas Area (3-003.01)
Disadvantaged Community: Not reported
CA Enviroscreen 3 Score: 11-15%
CA Enviroscreen 4 Score: 15-20%
Military DOD Site: No
Facility Project Subtype: Not reported
RWQCB Region: CENTRAL COAST RWQCB (REGION 3)
Site History: Not reported

LUST:
Global Id: T0608591843
Action Type: Other
Date: 01/02/1965

JOHN W. JONES (Continued) **U001601568**

Action: Leak Reported

LUST:
Global Id: T0608591843
Status: Open - Case Begin Date
Status Date: 03/05/1997

Global Id: T0608591843
Status: Open - Site Assessment
Status Date: 03/05/1997

Global Id: T0608591843
Status: Completed - Case Closed
Status Date: 01/09/2001

LUST SANTA CLARA:
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City,State,Zip: MORGAN HILL, CA
Region: SANTA CLARA
SCVWD ID: 10S3E04K01F
Date Closed: 01/09/2001
EDR Link ID: 10S3E04K01F

HIST UST:
Name: JOHN W. JONES
Address: 14905 SANTA TERESA BLVD
City,State,Zip: MORGAN HILL, CA 95037
File Number: Not reported
URL: Not reported
Region: STATE
Facility ID: 00000049662
Facility Type: Other
Other Type: Not reported
Contact Name: Not reported
Telephone: 4087792847
Owner Name: JOHN W. JONES
Owner Address: 14905 SANTA TERESA BLVD
Owner City,St,Zip: MORGAN HILL, CA 95037
Total Tanks: 0001

Tank Num: 001
Container Num: 0000000001
Year Installed: Not reported
Tank Capacity: 00000800
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: Visual

A5 **CHERI SCALES** **HWTS** **S124567740**
Target **14905 SANTA TERESA RD** **N/A**
Property **MORGAN HILL, CA 95037**

Site 5 of 7 in cluster A

Actual: **343 ft.**

HWTS:
Name: CHERI SCALES
Address: 14905 SANTA TERESA RD
Address 2: Not reported
City,State,Zip: MORGAN HILL, CA 95037
EPA ID: CAC002353815
Inactive Date: 01/11/2002
Create Date: 03/21/2001
Last Act Date: Not reported
Mailing Name: Not reported
Mailing Address: 5061 TOTTENHAM CRT
Mailing Address 2: Not reported
Mailing City,State,Zip: SAN JOSE, CA 951360000
Owner Name: CHERI SCALES
Owner Address: 5061 TOTTENHAM CRT
Owner Address 2: Not reported
Owner City,State,Zip: SAN JOSE, CA 951360000
Owner Phone: Not reported
Owner Fax: Not reported
Contact Name: CHERI SCALES/ RESP PARTY
Contact Address: 5061 TOTTENHAM CRT
Contact Address 2: Not reported
City,State,Zip: SAN JOSE, CA 951360000
Contact Phone: Not reported
Contact Fax: Not reported
Facility Status: Inactive
Facility Type: TEMPORARY
Category: STATE
Latitude: 37.092492
Longitude: -121.644284

A6 **RUTH JONES RESIDENCE** **RGA LUST** **S114679339**
Target **14905 SANTA TERESA BLVD** **N/A**
Property **MORGAN HILL, CA**

Site 6 of 7 in cluster A

Actual: **343 ft.**

RGA LUST:
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2012 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2011 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2010 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE

RUTH JONES RESIDENCE (Continued) **S114679339**

Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2009 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2008 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2007 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2006 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2005 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD
Name: RUTH JONES RESIDENCE
Address: 14905 SANTA TERESA BLVD
City: MORGAN HILL
State: MORGAN HILL
2002 RUTH JONES RESIDENCE 14905 SANTA TERESA BLVD

A7 **JONES CHRISTMAS TREE FARM** **HAZNET S112880734**
Target **14905 SANTA TERESA RD** **HWTS N/A**
Property **MORGAN HILL, CA 95037**

Site 7 of 7 in cluster A

Actual: **343 ft.**

HAZNET:
Name: JONES CHRISTMAS TREE FARM
Address: 14905 SANTA TERESA RD
Address 2: Not reported
City,State,Zip: MORGAN HILL, CA 950370000
Contact: CHERI SCALES-MGR
Telephone: 4082267855
Mailing Name: Not reported
Mailing Address: 14905 SANTA TERESA RD

Year: 1997
Gepaid: CAC001303720
TSD EPA ID: CAD009466392
CA Waste Code: 512 - Other empty containers 30 gallons or more
Disposal Method: R01 - Recycler
Tons: 0.5

Additional Info:
Year: 1997
Gen EPA ID: CAC001303720

JONES CHRISTMAS TREE FARM (Continued) **S112880734**

Shipment Date: 19970529
Creation Date: 12/4/1997 0:00:00
Receipt Date: 19970625
Manifest ID: 95995944
Trans EPA ID: CAD092205202
Trans Name: Not reported
Trans 2 EPA ID: CAD982484370
Trans 2 Name: Not reported
TSDF EPA ID: CAD009466392
Trans Name: Not reported
TSDF Alt EPA ID: Not reported
TSDF Alt Name: Not reported
Waste Code Description: 512 - Other empty containers 30 gallons or more
RCRA Code: Not reported
Meth Code: R01 - Recycler
Quantity Tons: 0.5
Waste Quantity: 1000
Quantity Unit: P
Additional Code 1: Not reported
Additional Code 2: Not reported
Additional Code 3: Not reported
Additional Code 4: Not reported
Additional Code 5: Not reported

HWTS:
Name: JONES CHRISTMAS TREE FARM
Address: 14905 SANTA TERESA RD
Address 2: Not reported
City,State,Zip: MORGAN HILL, CA 95037
EPA ID: CAC001303720
Inactive Date: 10/25/2000
Create Date: 05/14/1997
Last Act Date: Not reported
Mailing Name: Not reported
Mailing Address: 14905 SANTA TERESA RD
Mailing Address 2: Not reported
Mailing City,State,Zip: MORGAN HILL, CA 950370000
Owner Name: RUTH JONES
Owner Address: 14905 SANTA TERESA RD
Owner Address 2: Not reported
Owner City,State,Zip: MORGAN HILL, CA 950370000
Owner Phone: Not reported
Owner Fax: Not reported
Contact Name: CHERI SCALES-MGR
Contact Address: 14905 SANTA TERESA RD
Contact Address 2: Not reported
City,State,Zip: MORGAN HILL, CA 950370000
Contact Phone: Not reported
Contact Fax: Not reported
Facility Status: Inactive
Facility Type: TEMPORARY
Category: STATE
Latitude: 37.092492
Longitude: -121.644284

B8 **RIST QUARRY** **LUST** **S101303709**
West **14905 WATSONVILLE** **Cortese** **N/A**
< 1/8 **MORGAN HILL, CA 95037** **HIST CORTESE**
0.022 mi. **CERS**
116 ft. **Site 1 of 2 in cluster B**

Relative:
Higher

Actual:
366 ft.

LUST:

Name:	RIST QUARRY
Address:	14905 WATSONVILLE RD
City,State,Zip:	MORGAN HILL, CA 95037
Lead Agency:	SANTA CLARA COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608539262
Global Id:	T0608539262
Latitude:	37.092496
Longitude:	-121.649063
Status:	Completed - Case Closed
Status Date:	04/02/1996
Case Worker:	DEH
RB Case Number:	3398
Local Agency:	SANTA CLARA COUNTY LOP
File Location:	All Files are on GeoTracker or in the Local Agency Database
Local Case Number:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Waste Oil / Motor / Hydraulic / Lubricating
EPA Region:	9
Coordinate Source:	Google Map Move
Cuf Case:	NO
Quantity Released Gallons:	Not reported
Begin Date:	10/17/1989
Leak Reported Date:	06/01/1992
How Discovered:	Not reported
How Discovered Description:	Not reported
Discharge Source:	Not reported
Discharge Cause:	Not reported
Stop Method:	Not reported
Stop Description:	Not reported
No Further Action Date:	04/02/1996
CA Water Watershed Name:	Pajaro River - South Santa Clara Valley (305.30)
Dwr Groundwater Subbasin Name:	Gilroy-Hollister Valley - Llagas Area (3-003.01)
Disadvantaged Community:	Not reported
CA Enviroscreen 3 Score:	11-15%
CA Enviroscreen 4 Score:	15-20%
Military DOD Site:	No
Facility Project Subtype:	Not reported
RWQCB Region:	CENTRAL COAST RWQCB (REGION 3)
Site History:	Not reported

LUST:

Global Id:	T0608539262
Contact Type:	Local Agency Caseworker - Primary Caseworker
Contact Name:	DEH CASEWORKER
Organization Name:	SANTA CLARA COUNTY LOP
Address:	1555 Berger Drive, Suite 300
City:	SAN JOSE
Email:	smp@deh.sccgov.org
Phone Number:	4089183400

LUST:

RIST QUARRY (Continued) **S101303709**

Global Id:	T0608539262
Action Type:	RESPONSE
Date:	04/02/1996
Action:	Other Report / Document
Global Id:	T0608539262
Action Type:	REMEDIATION
Date:	10/17/1989
Action:	Excavation
Global Id:	T0608539262
Action Type:	ENFORCEMENT
Date:	04/02/1996
Action:	Closure/No Further Action Letter
Global Id:	T0608539262
Action Type:	Other
Date:	06/01/1992
Action:	Leak Reported
Global Id:	T0608539262
Action Type:	ENFORCEMENT
Date:	10/02/1995
Action:	Notice of Responsibility - #39230

LUST:

Global Id:	T0608539262
Status:	Open - Case Begin Date
Status Date:	10/17/1989
Global Id:	T0608539262
Status:	Open - Site Assessment
Status Date:	10/17/1989
Global Id:	T0608539262
Status:	Completed - Case Closed
Status Date:	04/02/1996

LUST SANTA CLARA:

Name:	RIST QUARRY
Address:	14905 WATSONVILLE RD
City,State,Zip:	UNINCORPORATED, CA
Region:	SANTA CLARA
SCVWD ID:	10S3E04L01F
Date Closed:	04/02/1996
EDR Link ID:	10S3E04L01F

CORTESE:

Name:	RIST QUARRY
Address:	14905 WATSONVILLE RD
City,State,Zip:	MORGAN HILL, CA 95037
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0608539262
Site/Facility Type:	LUST CLEANUP SITE

RIST QUARRY (Continued) **S101303709**

Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

HIST CORTESE:

edr_fname:	RIST QUARRY
edr_fadd1:	14905 WATSONVILLE
City,State,Zip:	MORGAN HILL, CA 95037
Region:	CORTESE
Facility County Code:	43
Reg By:	LTNKA
Reg Id:	728

CERS:

Name:	RIST QUARRY
Address:	14905 WATSONVILLE RD
City,State,Zip:	MORGAN HILL, CA 95037
Site ID:	680464
CERS ID:	T0608539262
CERS Description:	Leaking Underground Storage Tank Cleanup Site

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	DEH CASEWORKER - SANTA CLARA COUNTY LOP
Entity Title:	Not reported
Affiliation Address:	1555 Berger Drive, Suite 300
Affiliation City:	SAN JOSE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	4089183400,

B9 **RIST QUARRY** **LUST S103881443**
West **14905 WATSONVILLE RD** **HIST LUST N/A**
< 1/8 **UNINCORPORATED, CA 95037**
0.022 mi.
116 ft. **Site 2 of 2 in cluster B**

Relative: LUST REG 3:
Higher

Region:	3
Regional Board:	Central Coast Region
Facility County:	Santa Clara

Actual:
366 ft.

RIST QUARRY (Continued) **S103881443**

Global ID:	T0608539262
Status:	Case Closed
Case Number:	3398
Local Case Num:	10S3E04L01f
Case Type:	A
Substance:	Waste Oil
Quantity:	Not reported
Abatement Method:	Not reported
Leak Source:	Not reported
Leak Cause:	Not reported
How Stopped:	Not reported
How Discovered:	Not reported
Release Date:	06/01/1992
Discovered Date:	Not reported
Enter Date:	/ /
Stop Date:	Not reported
Review Date:	/ /
Enforce Date:	Not reported
Close Date:	4/2/96
Enforcement Type:	NOR
Responsible Party:	Not reported
RP Address:	Not reported
Contact:	Not reported
Cross Street:	Not reported
Local Agency:	43099L
Lead Agency:	Local Agency
Staff Initials:	Not reported
Confirm Leak:	Not reported
Workplan:	Not reported
Prelim Assess:	10/17/89
Pollution Char:	/ /
Remedial Plan:	Not reported
Remedial Action:	Not reported
Monitoring:	/ /
Pilot Program:	LUST
Interim Action:	Not reported
Funding:	Not reported
MTBE Class:	*
Max MTBE Grnd Wtr:	Not reported
Max MTBE Soil:	Not reported
Max MTBE Data:	/ /
MTBE Tested:	NRQ
Lat/Long:	Not reported
Soil Qualifier:	Not reported
Grnd Wtr Qualifier:	Not reported
Mtbe Concentratn:	0
Mtbe Fuel:	0
Org Name:	Not reported
Basin Plan:	Not reported
Beneficial:	MUN
Priority:	Not reported
UST Cleanup Fund ID:	Not reported
Suspended:	Not reported
Operator:	Not reported
Water System:	Not reported
Well Name:	Not reported
Distance From Well:	0

RIST QUARRY (Continued) **S103881443**

Assigned Name: Not reported
Summary: Not reported

HIST LUST SANTA CLARA:
Name: Rist Quarry
Address: 14905 Watsonville Rd
City: Unincorporated
Region: SANTA CLARA
Region Code: 3
SCVWD ID: 10S3E04L01
Oversite Agency: SCVWD
Date Listed: 1992-07-09 00:00:00
Closed Date: 1996-04-02 00:00:00

10
NNW
< 1/8
0.095 mi.
499 ft.

Relative:
Lower

Actual:
342 ft.

SPRINT PCS-SF54XC407 **HIST UST U001601550**
15065 SUNNYSIDE AV **CUPA Listings N/A**
MORGAN HILL, CA 95037 **CERS**

HIST UST:
Name: HARRY H CHRISTENSE
Address: 15065 SUNNYSIDE AVE
City,State,Zip: MORGAN HILL, CA 95037
File Number: Not reported
URL: Not reported
Region: STATE
Facility ID: 00000048471
Facility Type: Other
Other Type: Not reported
Contact Name: Not reported
Telephone: 4087793732
Owner Name: HARRY H CHRISTENSE
Owner Address: 15065 SUNNYSIDE AVE
Owner City,St,Zip: MORGAN HILL, CA 95037
Total Tanks: 0001

Tank Num: 001
Container Num: 1001
Year Installed: 1964
Tank Capacity: 00000350
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: None

CUPA SANTA CLARA:
Name: SPRINT PCS-SF54XC407
Address: 15065 SUNNYSIDE AV
City,State,Zip: MORGAN HILL, CA 95037
Region: SANTA CLARA
PE#: 2502
Program Description: HAZMAT STORAGE FACILITY-MINIMAL STORAGE SITE
Program Identifier: DEH PERMIT-HAZ MAT STORAGE PROGRAM
Latitude: 37.09481
Longitude: -121.646992
Record ID: PR0370838

SPRINT PCS-SF54XC407 (Continued) **U001601550**

Facility ID: FA0254297

Name: T-MOBILE USA SF71831M
Address: 15065 SUNNYSIDE AV
City,State,Zip: MORGAN HILL, CA 95037
Region: SANTA CLARA
PE#: 2502
Program Description: HAZMAT STORAGE FACILITY-MINIMAL STORAGE SITE
Program Identifier: DEH PERMIT-HAZ MAT STORAGE PROGRAM
Latitude: 37.09481
Longitude: -121.646992
Record ID: PR0382500
Facility ID: FA0260910

CERS:
Name: SPRINT PCS-SF54XC407
Address: 15065 SUNNYSIDE AV
City,State,Zip: MORGAN HILL, CA 95037
Site ID: 408257
CERS ID: 10073179
CERS Description: Chemical Storage Facilities

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-25-2013
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: TODAY'S ON-SITE INSPECTION CONTACT WAS RICHARD LORENZEN OF ERICSSON.
Eval Division: Santa Clara County Environmental Health
Eval Program: HMRRP
Eval Source: CERS,

Affiliation:
Affiliation Type Desc: Parent Corporation
Entity Name: Sprint United Management Co.
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: PO BOX 7994
Affiliation City: SHAWNEE MISSION
Affiliation State: KS
Affiliation Country: Not reported
Affiliation Zip: 66207-0994
Affiliation Phone: ,

Affiliation Type Desc: CUPA District
Entity Name: Santa Clara County Environmental Health
Entity Title: Not reported
Affiliation Address: 1555 Berger Drive, Suite 300

SPRINT PCS-SF54XC407 (Continued) **U001601550**

Affiliation City: San Jose
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95112-2716
Affiliation Phone: (408) 918-3400,

Affiliation Type Desc: Legal Owner
Entity Name: SPRINT/ UNITED MANAGEMENT CO
Entity Title: Not reported
Affiliation Address: PO BOX 7994
Affiliation City: SHAWNEE MISSION
Affiliation State: KS
Affiliation Country: United States
Affiliation Zip: 66207-0994
Affiliation Phone: (702) 244-7212,

11
SW
1/4-1/2
0.271 mi.
1433 ft.

ROGER KNOPF **LUST S102432262**
14692 KNOPF COURT **HIST UST N/A**
MORGAN HILL, CA 95037 **Cortese**
HIST CORTESE
CERS

Relative:
Higher

Actual:
354 ft.

LUST:
Name: KNOPF RESIDENCE
Address: 14692 KNOPF CT
City,State,Zip: MORGAN HILL, CA 95037
Lead Agency: CENTRAL COAST RWQCB (REGION 3)
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608500062
Global Id: T0608500062
Latitude: 37.087918
Longitude: -121.649298
Status: Completed - Case Closed
Status Date: 12/16/1998
Case Worker: RB
RB Case Number: 321
Local Agency: SANTA CLARA COUNTY LOP
File Location: Not reported
Local Case Number: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Diesel
EPA Region: 9
Coordinate Source: Google Map Move
Cuf Case: NO
Quantity Released Gallons: Not reported
Begin Date: 10/01/1988
Leak Reported Date: 04/18/1989
How Discovered: Tank Closure
How Discovered Description: Not reported
Discharge Source: Other
Discharge Cause: Unknown
Stop Method: Not reported
Stop Description: Not reported
No Further Action Date: 12/16/1998
CA Water Watershed Name: Pajaro River - South Santa Clara Valley (305.30)
Dwr Groundwater Subbasin Name: Gilroy-Hollister Valley - Llagas Area (3-003.01)
Disadvantaged Community: Not reported

ROGER KNOPF (Continued) **S102432262**

CA Enviroscreen 3 Score: 11-15%
CA Enviroscreen 4 Score: 15-20%
Military DOD Site: No
Facility Project Subtype: Not reported
RWQCB Region: CENTRAL COAST RWQCB (REGION 3)
Site History: Not reported

LUST:
Global Id: T0608500062
Contact Type: Local Agency Caseworker
Contact Name: DEH CASEWORKER
Organization Name: SANTA CLARA COUNTY LOP
Address: 1555 Berger Drive, Suite 300
City: SAN JOSE
Email: smp@deh.sccgov.org
Phone Number: 4089183400

Global Id: T0608500062
Contact Type: Regional Board Caseworker - Primary Caseworker
Contact Name: RB3 STAFF
Organization Name: CENTRAL COAST RWQCB (REGION 3)
Address: 895 AEROVISTA PL, SUITE 101
City: SAN LUIS OBISPO
Email: centralcoast@waterboards.ca.gov
Phone Number: 8055493147

LUST:
Global Id: T0608500062
Action Type: Other
Date: 04/18/1989
Action: Leak Reported

Global Id: T0608500062
Action Type: Other
Date: 10/01/1988
Action: Leak Discovery

Global Id: T0608500062
Action Type: Other
Date: 10/01/1988
Action: Leak Stopped

LUST:
Global Id: T0608500062
Status: Open - Case Begin Date
Status Date: 10/01/1988

Global Id: T0608500062
Status: Completed - Case Closed
Status Date: 12/16/1998

LUST REG 3:
Region: 3
Regional Board: Central Coast Region
Facility County: Santa Clara

ROGER KNOPF (Continued) **S102432262**

Global ID: T0608500062
Status: Case Closed
Case Number: 321
Local Case Num: Not reported
Case Type: S
Substance: Diesel
Quantity: Not reported
Abatement Method: No Action Required - incident is minor, requiring no remedial action
Leak Source: UNK
Leak Cause: UNK
How Stopped: Not reported
How Discovered: Tank Closure
Release Date: 04/18/1989
Discovered Date: 10/1/88
Enter Date: 07/23/1989
Stop Date: 10/1/88
Review Date: 07/23/1989
Enforce Date: 1/1/65
Close Date: 12/16/98
Enforcement Type: None Taken
Responsible Party: Not reported
RP Address: Not reported
Contact: Not reported
Cross Street: WATSANVILLE ROAD
Local Agency: 43099L
Lead Agency: Regional Board
Staff Initials: JHM
Confirm Leak: Not reported
Workplan: Not reported
Prelim Assess: Not reported
Pollution Char: / /
Remedial Plan: Not reported
Remedial Action: Not reported
Monitoring: / /
Pilot Program: UST
Interim Action: 0
Funding: R
MTBE Class: *
Max MTBE Grnd Wtr: Not reported
Max MTBE Soil: Not reported
Max MTBE Data: / /
MTBE Tested: NRQ
Lat/Long: 37.0885808 / -121.6513137
Soil Qualifier: Not reported
Grnd Wtr Qualifier: Not reported
Mtbe Concentratn: 0
Mtbe Fuel: 0
Org Name: Not reported
Basin Plan: 5.30
Beneficial: Not reported
Priority: 0
UST Cleanup Fund ID: Not reported
Suspended: Not reported
Operator: Not reported
Water System: STONEBRIDGE MUTUAL WATER CO
Well Name: WELL 01
Distance From Well: 0

ROGER KNOPF (Continued) **S102432262**

Assigned Name: 10S/03E-04N03 M
Summary: SOIL SAMPLES TAKEN ON SITE INDICATES CONTAMINATION. SAMPLE #002279 TPH AS DIESEL 1.2 PPM; SAMPLE #2 002277 TPH AS DIESEL .65 PPM. COPY OF ANALYTICAL RESULTS IS ATTACHED. ADMINISTRATIVELY DETERMINED CLOSURE DATE

HIST UST:
Name: ROGER KNOPF
Address: 14692 KNOPF COURT
City,State,Zip: MORGAN HILL, CA 95037
File Number: 00020804
URL: https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/00020804.pdf
Region: Not reported
Facility ID: Not reported
Facility Type: Not reported
Other Type: Not reported
Contact Name: Not reported
Telephone: Not reported
Owner Name: Not reported
Owner Address: Not reported
Owner City,St,Zip: Not reported
Total Tanks: Not reported

Tank Num: Not reported
Container Num: Not reported
Year Installed: Not reported
Tank Capacity: Not reported
Tank Used for: Not reported
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: Not reported

Click here for Geo Tracker PDF:

CORTESE:
Name: KNOPF RESIDENCE
Address: 14692 KNOPF CT
City,State,Zip: MORGAN HILL, CA 95037
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0608500062
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED
Status Date: Not reported
Site Code: Not reported
Latitude: Not reported
Longitude: Not reported
Owner: Not reported
Enf Type: Not reported
Swat R: Not reported
Flag: active
Order No: Not reported
Waste Discharge System No: Not reported
Effective Date: Not reported
Region 2: Not reported
WID Id: Not reported

ROGER KNOPF (Continued) **S102432262**

Solid Waste Id No: Not reported
Waste Management Uit Name: Not reported
File Name: Active Open

HIST CORTESE:
edr_fname: KNOPF RESIDENCE
edr_fadd1: 14692 KNOPF
City,State,Zip: MORGAN HILL, CA 95037
Region: CORTESE
Facility County Code: 43
Reg By: LTNKA
Reg Id: 321

CERS:
Name: KNOPF RESIDENCE
Address: 14692 KNOPF CT
City,State,Zip: MORGAN HILL, CA 95037
Site ID: 663599
CERS ID: T0608500062
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: DEH CASEWORKER - SANTA CLARA COUNTY LOP
Entity Title: Not reported
Affiliation Address: 1555 Berger Drive, Suite 300
Affiliation City: SAN JOSE
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 4089183400,

Affiliation Type Desc: Regional Board Caseworker
Entity Name: RB3 STAFF - CENTRAL COAST RWQCB (REGION 3)
Entity Title: Not reported
Affiliation Address: 895 AEROVISTA PL, SUITE 101
Affiliation City: SAN LUIS OBISPO
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 8055493147,

Count: 1 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MORGAN HILL	S111120580	FORMER WHITE GASOLINE	MONTEREY RD & WATSONVILLE RD		LUST

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: EPA
Telephone: N/A
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites
A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: EPA
Telephone: N/A
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens
Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56
Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: EPA
Telephone: N/A
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing
A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 03/26/2023
Date Data Arrived at EDR: 03/28/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 06/23/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System
SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System
LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/08/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 82

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/20/2023
Date Data Arrived at EDR: 02/21/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/20/2023
Date Data Arrived at EDR: 02/21/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/20/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 70
Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

Lists of state- and tribal (Superfund) equivalent sites

RESPONSE: State Response Sites
Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 04/24/2023
Date Data Arrived at EDR: 04/25/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 79
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

ENVIROSTOR: EnviroStor Database
The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 04/24/2023
Date Data Arrived at EDR: 04/25/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 79
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF (SWIS): Solid Waste Information System
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/26/2023
Number of Days to Update: 78
Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/08/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Quarterly

Lists of state and tribal leaking storage tanks

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/30/2023
Number of Days to Update: 23
Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27
Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/14/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 05/09/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47
Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22
Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 03/08/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 82
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 02/23/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/26/2023
Number of Days to Update: 80
Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/24/2023
Number of Days to Update: 78
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/14/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66
Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

Lists of state and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 06/13/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 04/24/2023
Date Data Arrived at EDR: 04/25/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 79
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state and tribal brownfield sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 03/20/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 06/06/2023
Number of Days to Update: 77
Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 06/14/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 04/06/2023
Date Data Arrived at EDR: 04/13/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 6
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/08/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30
Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/24/2023
Number of Days to Update: 78
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 11/16/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 83
Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/31/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 05/22/2023
Date Data Arrived at EDR: 05/23/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 48
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 04/24/2023
Date Data Arrived at EDR: 04/25/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 79
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs
A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2022
Date Made Active in Reports: 02/09/2023
Number of Days to Update: 71
Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 06/21/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CERS HAZ WASTE: CERS HAZ WASTE
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/17/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/11/2023
Number of Days to Update: 84
Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/22/2023
Date Data Arrived at EDR: 05/23/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 48
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing
Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35
Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18
Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing
Aboveground storage tank sites

Date of Government Version: 04/28/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 77
Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24
Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 04/17/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/06/2023
Number of Days to Update: 79
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Quarterly

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 02/23/2023
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 03/23/2023
Number of Days to Update: 27
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing
Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 02/27/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 78
Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/19/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 70
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CHMIRS: California Hazardous Material Incident Report System
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 04/15/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 77
Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)
Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/30/2023
Number of Days to Update: 23
Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)
Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50
Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11
Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 05/08/2023
Date Data Arrived at EDR: 05/16/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 55

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/16/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/10/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/11/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/13/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/01/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/04/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/16/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 02/16/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 75

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/19/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 04/17/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 83

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/27/2022
Date Data Arrived at EDR: 05/04/2022
Date Made Active in Reports: 05/10/2022
Number of Days to Update: 6
Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 06/12/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35
Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2023
Date Data Arrived at EDR: 04/04/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 66
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/07/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/15/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 70
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/12/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 04/14/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 87
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/04/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 06/22/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 03/31/2023
Date Data Arrived at EDR: 04/20/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 81
Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

BRS: Biennial Reporting System
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11
Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/20/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Biennially

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546
Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program
DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023
Date Data Arrived at EDR: 03/03/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 98
Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74
Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/24/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36
Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/02/2023
Date Data Arrived at EDR: 02/22/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 84

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/24/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data
Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 04/03/2023
Date Data Arrived at EDR: 04/04/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 66

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/07/2022
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 82

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines
An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/17/2023
Date Data Arrived at EDR: 03/17/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 74

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/13/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/02/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 24

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 03/25/2023
Date Data Arrived at EDR: 03/31/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 06/29/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 11/09/2021
Date Data Arrived at EDR: 10/20/2022
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 82

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 05/15/2023
Date Data Arrived at EDR: 05/17/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 54

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information
EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 06/07/2023
Date Data Arrived at EDR: 06/08/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 1

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/05/2023
Number of Days to Update: 59

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

AQUEOUS FOAM: Former Fire Training Facility Assessments Listing

Airports shown on this list are those believed to use Aqueous Film Forming Foam (AFFF), and certified by the Federal Aviation Administration (FAA) under Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139). This list was created by SWRCB using information available from the FAA. Location points shown are from the latitude and longitude listed on the FAA airport master record.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/23/2023
Number of Days to Update: 77

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 03/20/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 06/06/2023
Number of Days to Update: 77

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 06/14/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 12/07/2021
Date Data Arrived at EDR: 05/09/2022
Date Made Active in Reports: 05/17/2022
Number of Days to Update: 8

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 05/08/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 02/17/2023
Date Data Arrived at EDR: 02/17/2023
Date Made Active in Reports: 05/09/2023
Number of Days to Update: 81

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 02/23/2023
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 05/15/2023
Number of Days to Update: 80

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN NO SONOMA CO DIST: Norther Sonoma County County Air Pollution Control District Drycleaner Facility Listing

A listing of drycleaner facility locations, for the Northern Sonoma County Air Pollution Control District.,

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Santa Barbara County Air Pollution Control District
Telephone: 707-433-5911
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN PLACER CO DIST: Placer County Air Quality Management District Drycleaner Facility Listing

A listing of drycleaner facility locations, for the Placer County Air Quality Management District.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: Placer County Air Quality Management District
Telephone: 530-745-2335
Last EDR Contact: 05/11/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN EAST KERN DIST: Eastern Kern Air Pollution Control District District Drycleaner Facility Listing

A listing of drycleaner facility locations, for the Eastern Kern Air Pollution Control District.

Date of Government Version: 01/12/2023
Date Data Arrived at EDR: 04/26/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 79

Source: Eastern Kern Air Pollution Control District
Telephone: 661-862-9684
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN BAY AREA DIST: Bay Area Air Quality Management District Drycleaner Facility Listing

Bay Area Air Quality Management District Drycleaner Facility Listing.

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1432

Source: Bay Area Air Quality Management District
Telephone: 415-516-1916
Last EDR Contact: 07/13/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN BUTTE CO DIST: Butte County Air Quality Management DistrictDrycleaner Facility Listing
Butte County Air Quality Management DistrictDrycleaner Facility Listing.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1469

Source: Butte County Air Quality Management District
Telephone: 530-332-9400
Last EDR Contact: 07/13/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN CALAVERAS CO DIST: Calaveras County Environmental Management Agency Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Calaveras County Environmental Management Agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1412

Source: Calaveras County Environmental Management Agency
Telephone: 209-754-6399
Last EDR Contact: 04/24/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN IMPERIAL CO DIST: Imperial County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Imperial County Air Pollution Control District

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 04/26/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 79

Source: Imperial County Air Pollution Control District
Telephone: 442-265-1800
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN GLENN CO DIST: Glenn County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Glenn County Air Pollution Control District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Glenn County Air Pollution Control District
Telephone: 530-934-6500
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN MENDO CO DIST: Mendocino County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mendocino County Air Quality Management District.

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 77

Source: Mendocino County Air Quality Management District
Telephone: 707-463-4354
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN GRANT: Grant Recipients List
Assembly Bill 998 (AB 998) established the Non-Toxic Dry Cleaning Incentive Program to provide financial assistance to the dry cleaning industry to switch from systems using perchloroethylene (Perc), an identified toxic air contaminant and potential human carcinogen, to non-toxic and non-smog forming alternatives.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 816

Source: California Air Resources Board
Telephone: 916-323-0006
Last EDR Contact: 05/11/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

DRYCLEAN MOJAVE DESERT DIST: Mojave Desert Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mojave Desert Air Quality Management District.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 78

Source: Mojave Desert Air Quality Management District
Telephone: 760-245-1661
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DRYCLEAN LAKE CO DIST: Lake County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Lake County Air Quality Management District,

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1455

Source: Lake County Air Quality Management District
Telephone: 707-263-7000
Last EDR Contact: 05/11/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN MONTEREY BAY DIST: Monterey Bay Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Monterey Bay Air Quality Management District.

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 04/26/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 79

Source: Monterey Bay Air Quality Management District
Telephone: 831-647-9411
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SHASTA CO DIST: Shasta County Air Quality Management District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Shasta County Air Quality Management District.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 78

Source: Shasta County Air Quality Management District
Telephone: 530-225-5674
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN NO COAST UNIFIED DIST: North Coast Unified Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the North Coast Unified Air Quality Management District.

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: North Coast Unified Air Quality Management District
Telephone: 707-443-3093
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN YOLO-SOLANO DIST: Yolo-Solano Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Yolo-Solano Air Quality Management District.

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 78

Source: Yolo-Solano Air Quality Management District
Telephone: 530-757-3650
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN NO SIERRA DIST: Northern Sierra Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sierra Air Quality Management District,

Date of Government Version: 05/07/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1455

Source: Northern Sierra Air Quality Management District
Telephone: 530-274-9350
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN DIEGO CO DIST: San Diego County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Diego County Air Pollution Control District.

Date of Government Version: 02/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1461

Source: San Diego County Air Pollution Control District
Telephone: 858-586-2616
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SACRAMENTO METO DIST: Sacramento Metropolitan Air Quality Management DistrictDrycleaner Facility Listing
A listing of drycleaner facility locations, for the Sacramento Metropolitan Air Quality Management District.

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 07/19/2023
Number of Days to Update: 82
Source: Sacramento Metropolitan Air Quality Management District
Telephone: 916-874-3958
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SANTA BARB CO DIST: Santa Barbara County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Santa Barbara County Air Pollution Control District.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475
Source: Santa Barbara County Air Pollution Control District
Telephone: 805-961-8867
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN JOAQ VAL DIST: San Joaquin Valley Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Joaquin Valley Air Pollution Control District.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/03/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1459
Source: San Joaquin Valley Air Pollution Control District
Telephone: 559-230-6001
Last EDR Contact: 05/11/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN LUIS OB CO DIST: San Luis Obispo County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Luis Obispo County Air Pollution Control District.

Date of Government Version: 04/23/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1467
Source: San Luis Obispo County Air Pollution Control District
Telephone: 805-781-5756
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN TEHAMA CO DIST: Tehama County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Tehama County Air Pollution Control District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1468
Source: Tehama County Air Pollution Control District
Telephone: 530-527-3717
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN AMADOR: Amador Air District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Amador Air Quality Management District

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 77
Source: Amador Air Quality Management District
Telephone: 209-257-0112
Last EDR Contact: 04/24/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN FEATHER RIVER DIST: Feather River Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Feather River Air Quality Management District.

Date of Government Version: 03/08/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 06/05/2023
Number of Days to Update: 88
Source: Feather River Air Quality Management District
Telephone: 530-634-7659
Last EDR Contact: 06/08/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/27/2021
Date Data Arrived at EDR: 09/01/2021
Date Made Active in Reports: 11/19/2021
Number of Days to Update: 79
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Annually

DRYCLEAN VENTURA CO DIST: Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Ventura County Air Pollution Control District.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475
Source: Ventura County Air Pollution Control District
Telephone: 805-645-1421
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/13/2022
Date Made Active in Reports: 08/30/2022
Number of Days to Update: 78
Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/09/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 04/17/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/06/2023
Number of Days to Update: 79
Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 01/11/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77
Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 06/28/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/15/2023
Date Made Active in Reports: 05/09/2023
Number of Days to Update: 83
Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Varies

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 02/13/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 05/08/2023
Number of Days to Update: 83
Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 05/16/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 02/13/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 05/08/2023
Number of Days to Update: 83
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/16/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 04/03/2023
Date Data Arrived at EDR: 04/04/2023
Date Made Active in Reports: 06/27/2023
Number of Days to Update: 84
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 06/29/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Quarterly

HAZNET: Facility and Manifest Data
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 07/05/2022
Date Made Active in Reports: 09/19/2022
Number of Days to Update: 76
Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/07/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Annually

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/23/2023
Number of Days to Update: 77
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 01/09/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 78
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/28/2023
Number of Days to Update: 80
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/08/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 02/27/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 05/22/2023
Number of Days to Update: 83
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 03/09/2023
Date Data Arrived at EDR: 03/10/2023
Date Made Active in Reports: 05/24/2023
Number of Days to Update: 75
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82
Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Annually

SANTA CRUZ CO SITE MITI: Site Mitigation Listing
Sites may become contaminated with toxic chemicals through illegal dumping or disposal, from leaking underground storage tanks, or through industrial or commercial activities.The goal of the site mitigation program is to protect the public health and the environment while facilitating completion of contaminated site clean-up projects in a timely manner.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 06/23/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 20
Source: Santa Cruz Environmental Health Services
Telephone: 831-454-2761
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 07/01/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 90
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/07/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/13/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 05/24/2023
Number of Days to Update: 78
Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System
The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 02/27/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 78
Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data
The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 04/17/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/06/2023
Number of Days to Update: 79
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)
Non-Case Information sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)
Other Oil & Gas Projects sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/05/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Varies

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: No Update Planned

PFAS TRIS: List of PFAS Added to the TRI
Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/07/2023
Date Data Arrived at EDR: 06/08/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 1

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

HWTS: Hazardous Waste Tracking System
DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 04/13/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 83

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 08/23/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 98

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 03/29/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 06/13/2023
Number of Days to Update: 75

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List

Cupa Facility List

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 77

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing

Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing

Cupa Facility Listing

Date of Government Version: 03/17/2023
Date Data Arrived at EDR: 03/21/2023
Date Made Active in Reports: 06/06/2023
Number of Days to Update: 77

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List

Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 04/03/2023
Date Data Arrived at EDR: 04/20/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 81

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 02/13/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 05/08/2023
Number of Days to Update: 83

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/08/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 09/01/2022
Number of Days to Update: 23

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 06/28/2021
Date Data Arrived at EDR: 12/21/2021
Date Made Active in Reports: 03/03/2022
Number of Days to Update: 72

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 06/29/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/12/2021
Date Data Arrived at EDR: 08/12/2021
Date Made Active in Reports: 11/08/2021
Number of Days to Update: 88

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/12/2023
Date Data Arrived at EDR: 04/14/2023
Date Made Active in Reports: 06/28/2023
Number of Days to Update: 75

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 01/30/2023
Date Data Arrived at EDR: 02/01/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 77

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 05/04/2023
Date Data Arrived at EDR: 05/11/2023
Date Made Active in Reports: 06/14/2023
Number of Days to Update: 34

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 05/31/2023
Number of Days to Update: 34

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 04/03/2023
Date Data Arrived at EDR: 04/06/2023
Date Made Active in Reports: 06/26/2023
Number of Days to Update: 81

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/10/2023
Date Data Arrived at EDR: 04/11/2023
Date Made Active in Reports: 06/26/2023
Number of Days to Update: 76

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/10/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 03/29/2023
Number of Days to Update: 76

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/14/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 01/10/2022
Date Data Arrived at EDR: 01/12/2022
Date Made Active in Reports: 04/04/2022
Number of Days to Update: 82

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 07/13/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 11/01/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/22/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 11/01/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/22/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 03/02/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 07/07/2023
Number of Days to Update: 80

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/20/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 04/12/2023
Date Data Arrived at EDR: 05/02/2023
Date Made Active in Reports: 06/13/2023
Number of Days to Update: 42

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 06/21/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Semi-Annually

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/22/2021
Date Data Arrived at EDR: 11/18/2021
Date Made Active in Reports: 11/22/2021
Number of Days to Update: 4

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 02/15/2022
Date Data Arrived at EDR: 02/17/2022
Date Made Active in Reports: 05/11/2022
Number of Days to Update: 83

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 10/04/2021
Date Data Arrived at EDR: 10/06/2021
Date Made Active in Reports: 12/29/2021
Number of Days to Update: 84

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/25/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 75
Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 02/02/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/09/2023
Number of Days to Update: 89
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/02/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/04/2023
Number of Days to Update: 84
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 04/01/2023
Date Data Arrived at EDR: 05/18/2023
Date Made Active in Reports: 06/14/2023
Number of Days to Update: 27
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 08/26/2022
Date Data Arrived at EDR: 08/29/2022
Date Made Active in Reports: 11/15/2022
Number of Days to Update: 78
Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 05/08/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64
Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

RIVERSIDE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/10/2023
Date Data Arrived at EDR: 04/12/2023
Date Made Active in Reports: 06/28/2023
Number of Days to Update: 77
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 04/10/2023
Date Data Arrived at EDR: 04/12/2023
Date Made Active in Reports: 06/13/2023
Number of Days to Update: 62
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/21/2022
Date Made Active in Reports: 03/16/2023
Number of Days to Update: 85
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 06/29/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/09/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 82
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 06/29/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/04/2023
Number of Days to Update: 84
Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 02/15/2023
Date Data Arrived at EDR: 02/15/2023
Date Made Active in Reports: 05/09/2023
Number of Days to Update: 83

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 02/27/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 78

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 05/25/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 04/04/2023
Date Data Arrived at EDR: 04/05/2023
Date Made Active in Reports: 06/27/2023
Number of Days to Update: 83

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/22/2021
Date Data Arrived at EDR: 10/19/2021
Date Made Active in Reports: 01/13/2022
Number of Days to Update: 86

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 04/28/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 77

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 04/28/2023
Date Data Arrived at EDR: 04/28/2023
Date Made Active in Reports: 05/03/2023
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

SAN FRANCISO COUNTY:

SAN FRANCISCO MAHER: Maher Ordinance Property Listing
a listing of properties that fall within a Maher Ordinance, for all of San Francisco

Date of Government Version: 04/11/2023
Date Data Arrived at EDR: 04/13/2023
Date Made Active in Reports: 07/11/2023
Number of Days to Update: 89

Source: San Francisco Planning
Telephone: 628-652-7483
Last EDR Contact: 07/18/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/06/2023
Next Scheduled EDR Contact: 09/25/2023
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 02/09/2023
Date Data Arrived at EDR: 02/10/2023
Date Made Active in Reports: 05/05/2023
Number of Days to Update: 84

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/08/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 05/31/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 02/10/2023
Date Data Arrived at EDR: 02/10/2023
Date Made Active in Reports: 05/05/2023
Number of Days to Update: 84
Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county.
Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 05/17/2023
Next Scheduled EDR Contact: 09/04/2023
Data Release Frequency: No Update Planned

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90
Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51
Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/15/2021
Date Data Arrived at EDR: 09/16/2021
Date Made Active in Reports: 12/09/2021
Number of Days to Update: 84
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 07/02/2021
Date Data Arrived at EDR: 07/06/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 8
Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/13/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 09/24/2021
Number of Days to Update: 86
Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 06/13/2023
Next Scheduled EDR Contact: 10/02/2023
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2022
Date Data Arrived at EDR: 02/10/2022
Date Made Active in Reports: 05/04/2022
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/05/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 08/03/2022
Date Data Arrived at EDR: 08/25/2022
Date Made Active in Reports: 11/14/2022
Number of Days to Update: 81

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 05/23/2023
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 11/17/2022
Date Data Arrived at EDR: 11/21/2022
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 81

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 04/12/2023
Date Data Arrived at EDR: 04/13/2023
Date Made Active in Reports: 06/28/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 10/07/2022
Date Data Arrived at EDR: 10/07/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 75

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 05/10/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TUOLUMNE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/27/2023
Date Data Arrived at EDR: 04/25/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 80

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/21/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/03/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 03/27/2023
Date Data Arrived at EDR: 04/21/2023
Date Made Active in Reports: 07/07/2023
Number of Days to Update: 77

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/17/2023
Next Scheduled EDR Contact: 10/30/2023
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 05/26/2023
Date Data Arrived at EDR: 06/02/2023
Date Made Active in Reports: 06/14/2023
Number of Days to Update: 12

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/02/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 04/03/2023
Date Data Arrived at EDR: 04/18/2023
Date Made Active in Reports: 06/13/2023
Number of Days to Update: 56

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/21/2023
Next Scheduled EDR Contact: 10/09/2023
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 01/26/2023
Date Data Arrived at EDR: 01/27/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 82

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/19/2023
Next Scheduled EDR Contact: 11/06/2023
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/16/2022
Date Data Arrived at EDR: 11/16/2022
Date Made Active in Reports: 02/06/2023
Number of Days to Update: 82

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/11/2023
Next Scheduled EDR Contact: 08/21/2023
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/27/2023
Next Scheduled EDR Contact: 10/16/2023
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 10/29/2021
Date Made Active in Reports: 01/19/2022
Number of Days to Update: 82

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/06/2023
Next Scheduled EDR Contact: 10/23/2023
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/10/2022
Next Scheduled EDR Contact: 08/28/2023
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/01/2023
Next Scheduled EDR Contact: 09/18/2023
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ® - PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

2T325 14905 SANTA TERESA BLVD
14905 SANTA TERESA BLVD
MORGAN HILL, CA 95037

TARGET PROPERTY COORDINATES

Latitude (North):	37.091909 - 37° 5' 30.87''
Longitude (West):	121.645893 - 121° 38' 45.21''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	620343.9
UTM Y (Meters):	4105722.5
Elevation:	343 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	12008752 MOUNT MADONNA, CA
Version Date:	2018
Southeast Map:	12008710 GILROY, CA
Version Date:	2018

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

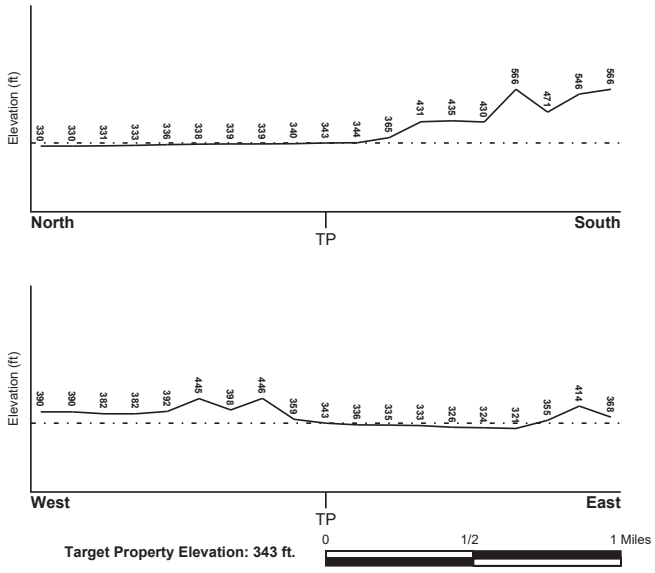
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General ENE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06085C0609H	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06085C0606H	FEMA FIRM Flood data
06085C0607H	FEMA FIRM Flood data
06085C0608H	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
MOUNT MADONNA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
A2	1/4 - 1/2 Mile SW	NE
1G	1/4 - 1/2 Mile SW	NE

For additional site information, refer to Physical Setting Source Map Findings.

* ©1996 Site--specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

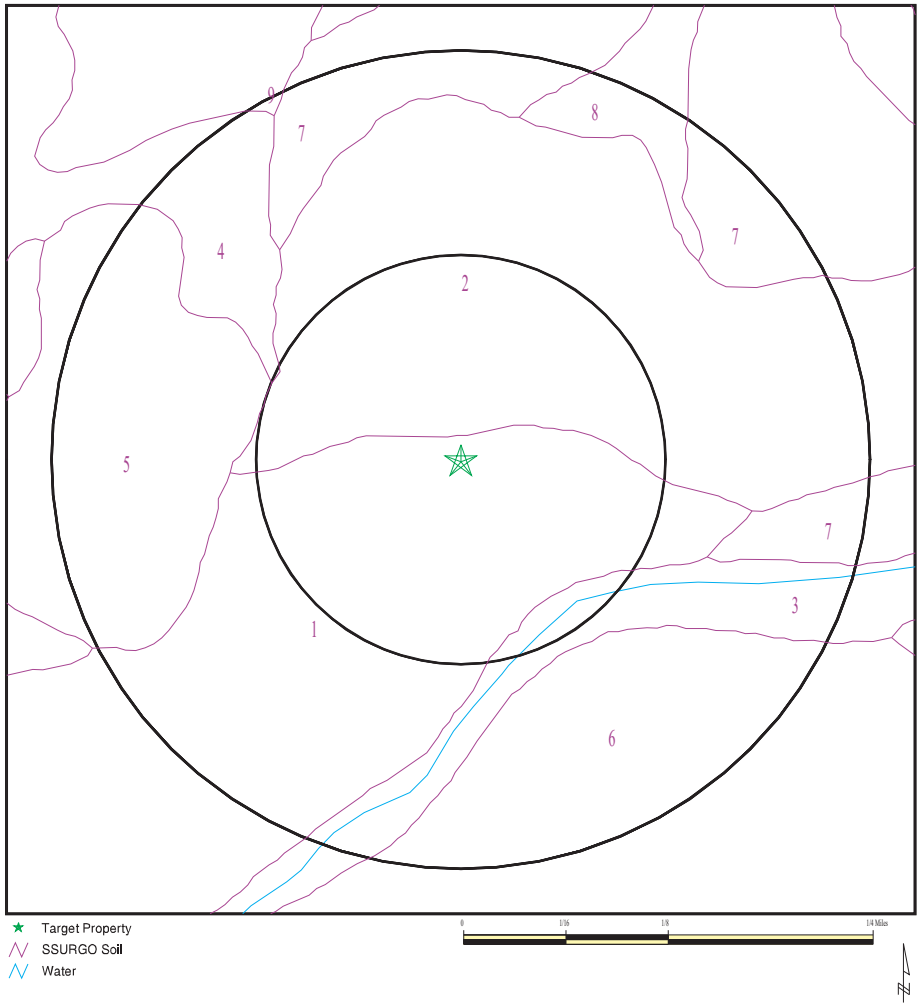
Era:	Mesozoic
System:	Cretaceous
Series:	Upper Mesozoic
Code:	uMze *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 7396597.2s



SITE NAME: 2T325 14905 Santa Teresa Blvd	CLIENT: Weber, Hayes, & Associates
ADDRESS: 14905 Santa Teresa Blvd	CONTACT: Shaun Ersoy
Morgan Hill CA 95037	INQUIRY #: 7396597.2s
LAT/LONG: 37.091909 / 121.645893	DATE: July 21, 2023 4:30 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: ZAMORA

Soil Surface Texture: clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.6
2	14 inches	35 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.6
3	35 inches	57 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	57 inches	70 inches	gravelly sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.6

Soil Map ID: 2

Soil Component Name: PLEASANTON

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
2	18 inches	44 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	44 inches	66 inches	gravelly sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1

Soil Map ID: 3

Soil Component Name: RIVERWASH

Soil Surface Texture: sand

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class:
Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 42 Min: 14	Max: Min:
2	5 inches	59 inches	sr to coarse sand to sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 42 Min: 14	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 4

Soil Component Name: KEEFERS

Soil Surface Texture: clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4 Min: 0.42	Max: 7.8 Min: 7.4
2	22 inches	38 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4 Min: 0.42	Max: 7.8 Min: 7.4
3	38 inches	59 inches	very gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4 Min: 0.42	Max: 7.8 Min: 7.4

Soil Map ID: 5

Soil Component Name: LOS GATOS

Soil Surface Texture: gravelly loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 89 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0 Min: 0	Max: Min:
2	9 inches	35 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0 Min: 0	Max: Min:
3	35 inches	38 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0 Min: 0	Max: Min:

Soil Map ID: 6

Soil Component Name: Vallecitos

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 48 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0 Min: 0	Max: Min:
2	9 inches	18 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0 Min: 0	Max: Min:
3	18 inches	22 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0 Min: 0	Max: Min:

Soil Map ID: 7

Soil Component Name: PLEASANTON

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
2	18 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
3	44 inches	66 inches	gravelly sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1

Soil Map ID: 8

Soil Component Name: PLEASANTON

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
2	18 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
3	44 inches	66 inches	gravelly sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1

Soil Map ID: 9

Soil Component Name: LOS ROBLES

Soil Surface Texture: clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.3 Min: 6.6
2	14 inches	59 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.3 Min: 6.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

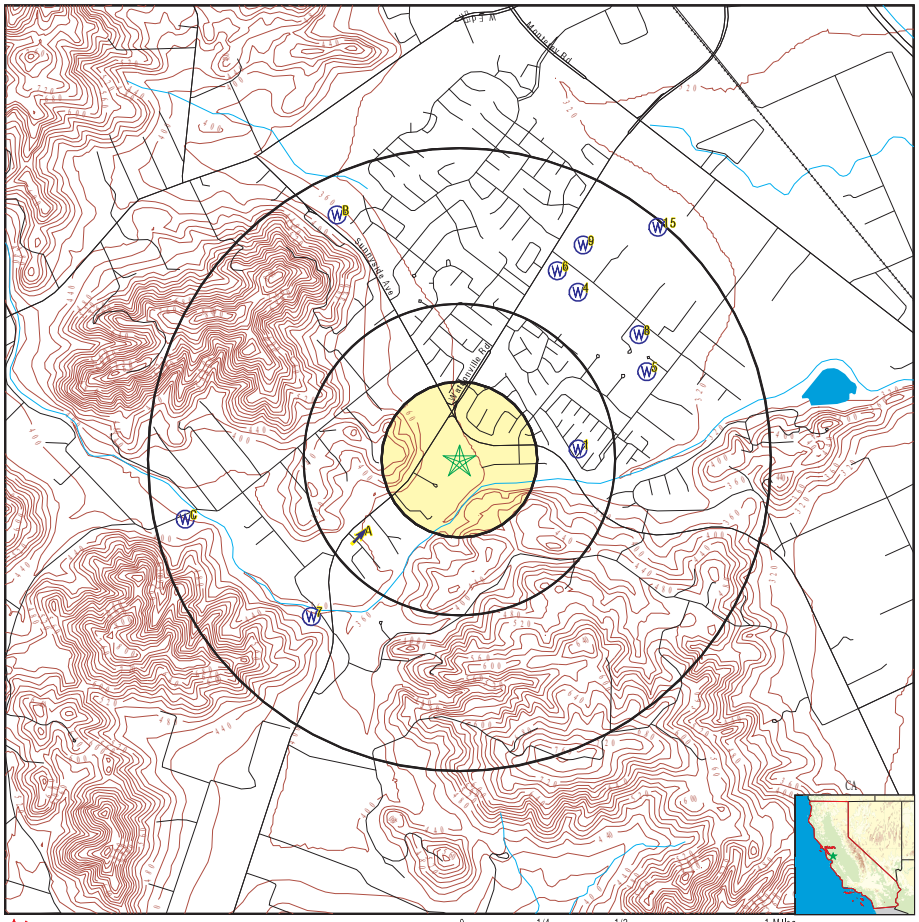
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CADWR0000021664	1/4 - 1/2 Mile East
A3	10122	1/4 - 1/2 Mile SW
4	CADWR0000025350	1/2 - 1 Mile NE
5	CADWR0000027327	1/2 - 1 Mile ENE
6	CAEDF0000018562	1/2 - 1 Mile NNE
7	CAEDF0000025457	1/2 - 1 Mile SW
8	10121	1/2 - 1 Mile NE
9	CAEDF0000028330	1/2 - 1 Mile NNE
B10	CADWR0000009312	1/2 - 1 Mile NNW
B11	CADWR0000001649	1/2 - 1 Mile NNW
B12	CADWR0000021442	1/2 - 1 Mile NNW
C13	10124	1/2 - 1 Mile West
C14	CADDW0000005643	1/2 - 1 Mile WSW
15	19843	1/2 - 1 Mile NE

PHYSICAL SETTING SOURCE MAP - 7396597.2s



SITE NAME: 2T325 14905 Santa Teresa Blvd ADDRESS: 14905 Santa Teresa Blvd Morgan Hill CA 95037 LAT/LONG: 37.091909 / 121.645893	CLIENT: Weber, Hayes, & Associates CONTACT: Shaun Ersoy INQUIRY #: 7396597.2s DATE: July 21, 2023 4:30 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
1 **East** **1/4 - 1/2 Mile** **Lower**		**CA WELLS**	**CADWR0000021664**

Well ID:	10S03E04H001M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	10S03E04H001M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=10S03E04H001M&store_num=		
GeoTracker Data:	Not Reported		

A2 **SW** **1/4 - 1/2 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	321 NE 3.11 8.23 Not Reported 07/15/1998		**AQUIFLOW**	**69639**

A3 **SW** **1/4 - 1/2 Mile** **Higher**				**CA WELLS**	**10122**
Seq:	10122	Prim sta c:	10S/03E-04N03 M		
Frds no:	4300787001	County:	43		
District:	73	User id:	43C		
System no:	4300787	Water type:	G		
Source nam:	WELL 01	Station ty:	WELL/AMBNT/MUN/INTAKE		
Latitude:	370518.0	Longitude:	1213903.0		
Precision:	3	Status:	AU		
Comment 1:	160 FEET WEST OF BOWDEN EXTENSION / 50 FEET SOUTH OF WATSONVILLE MORGA				
Comment 2:	HILL	Comment 3:	Not Reported		
Comment 4:	Not Reported	Comment 5:	Not Reported		
Comment 6:	Not Reported	Comment 7:	Not Reported		
System no:	4300787	System nam:	Stonebridge Mutual Water Co		
Hqname:	Not Reported	Address:	15755 WALTER BRETON DR.		
City:	MORGAN HILL	State:	CA		
Zip:	95037	Zip ext:	Not Reported		
Pop serv:	8	Connection:	14		
Area serve:	Not Reported				

---

4 **NE** **1/2 - 1 Mile** **Lower**				**CA WELLS**	**CADWR0000025350**
Well ID:	09S03E33R004M	Well Type:	UNK		
Source:	Department of Water Resources				
Other Name:	09S03E33R004M	GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=09S03E33R004M&store_num=				
GeoTracker Data:	Not Reported				

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

5
ENE
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000027327**

Well ID:	10S03E03D007M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	10S03E03D007M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=10S03E03D007M&store_num=		
GeoTracker Data:	Not Reported		

6
NNE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000018562**

Well ID:	AGC100000001-CCGC_0236	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	CCGC_0236
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGC100000001&assigned_name=CCGC_0236&store_num=		
GeoTracker Data:	Not Reported		

7
SW
1/2 - 1 Mile
Higher

CA WELLS **CAEDF0000025457**

Well ID:	AGL020008535-14475BOW	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	14475BOW
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGL020008535&assigned_name=14475BOW&store_num=		
GeoTracker Data:	Not Reported		

8
NE
1/2 - 1 Mile
Lower

CA WELLS **10121**

Seq:	10121	Prim sta c:	10S/03E-03D10 M
Frds no:	4300618001	County:	43
District:	73	User id:	43C
System no:	4300618	Water type:	G
Source nam:	WELL 01	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	370552.0	Longitude:	1213804.0
Precision:	3	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		
System no:	4300618	System nam:	Amberwood

Hqname:	Not Reported	Address:	Not Reported
City:	Not Reported	State:	Not Reported
Zip:	Not Reported	Zip ext:	Not Reported
Pop serv:	0	Connection:	0
Area serve:	Not Reported		

9
NNE
1/2 - 1 Mile
Lower

CA WELLS **CAEDF0000028330**

Well ID:	AGC100000001-CCGC_0427	Well Type:	MONITORING
Source:	Agricultural Lands	Other Name:	CCGC_0427
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=AGLAND&samp_date=&global_id=AGC100000001&assigned_name=CCGC_0427&store_num=		
GeoTracker Data:	Not Reported		

B10
NNW
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000009312**

Well ID:	09S03E33M002M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	09S03E33M002M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=09S03E33M002M&store_num=		
GeoTracker Data:	Not Reported		

B11
NNW
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000001649**

Well ID:	09S03E33M003M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	09S03E33M003M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=09S03E33M003M&store_num=		
GeoTracker Data:	Not Reported		

B12
NNW
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000021442**

Well ID:	09S03E33M014M	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	09S03E33M014M	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=09S03E33M014M&store_num=		
GeoTracker Data:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

C13
West
1/2 - 1 Mile
Higher

CA WELLS **10124**

Seq:	10124	Prim sta c:	10S/03E-05Q01 M
Frds no:	4300593001	County:	43
District:	05	User id:	HEN
System no:	4300593	Water type:	G
Source nam:	WELL 01	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	370523.0	Longitude:	1213939.0
Precision:	3	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		
System no:	4300593	System nam:	Morgan Hill Usd-Machado School
Hqname:	Not Reported	Address:	15600 CONCORD CIRC
City:	MORGAN HILL	State:	CA
Zip:	95037	Zip ext:	Not Reported
Pop serv:	59	Connection:	2
Area serve:	Not Reported		

C14
WSW
1/2 - 1 Mile
Higher

CA WELLS **CADDW0000005643**

Well ID:	4300593-001	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	WELL 01 - DESTROYED	XCLD	
GAMA PFAS Testing:	Not Reported		
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=4300593-001&store_num=		
GeoTracker Data:	Not Reported		

15
NE
1/2 - 1 Mile
Lower

CA WELLS **19843**

Seq:	19843	Prim sta c:	4300945-001
Frds no:	4300945001	County:	43
District:	05	User id:	HEN
System no:	4300945	Water type:	G
Source nam:	WELL 01	Station ty:	WELL/AMBNT
Latitude:	370610.0	Longitude:	1213800.0
Precision:	4	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		
System no:	4300945	System nam:	Royal Oaks Mushroom Enterprises, Inc.
Hqname:	Not Reported	Address:	15480 WATSONVILLE RD
City:	MORGAN HILL	State:	CA

Zip:	95037	Zip ext:	Not Reported
Pop serv:	45	Connection:	1
Area serve:	Not Reported		
Sample date:	03-DEC-13	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-AUG-12	Finding:	0.13
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	23-AUG-12	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-AUG-12	Finding:	1.16
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	23-AUG-12	Finding:	710.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	23-AUG-12	Finding:	0.156
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		

1G
SW
1/4 - 1/2 Mile
Lower

AQUIFLOW **69639**

Site ID:	321		
Groundwater Flow:	NE		
Shallow Water Depth:	3.11		
Deep Water Depth:	8.23		
Average Water Depth:	Not Reported		
Date:	07/15/1998		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
95037	21	0

Federal EPA Radon Zone for SANTA CLARA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 95037

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	-0.300 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX D

Related Reports

Closure Letters & Regulatory Correspondence

- 1998 Well Completion Report (Active Domestic Well)
-
- Fuel Leak Case Closure Cleanup Summary (Jan-2001)
-
Groundwater Monitoring Report & Request for Closure (October 2000)
-
Aboveground Storage Tank (AST) Investigation Report (June 1997)
-
Underground Storage Tank (AST) Investigation Report (June 1997)
-
Previous Phase I & II ESA Report (Sept-2013)
-

- 1998 Well Completion Report
(Active Domestic Well)
-

PLICATE
ller's Copy

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 708549

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTR

of
Owner's Well No.
Date Work Began 10-23-98 Ended 11-6-98
Local Permit Agency
Permit No. Permit Date

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL HORIZONTAL ANGLE (SPECIFY)
DRILLING METHOD Rotary FLUID Mud

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION (Describe material, grain size, color, etc.)
0	5	clay & gravel comb.
5	26	gravel w/ sand streaks
26	33	gravel w/small clay streaks
33	39	gravel
39	57	gravel w/small clay streaks
57	61	rock & yellow clay comb.
61	70	rock & shale comb.
70	93	hard grey rock w/fractures
93	107	loose dark gray shale (firm)
107	111	firm & frac. dark gray shale
111	118	dark gray shale & clay comb.
118	127	hard gray rock w/ fracture
127	143	loose & hard shale
143	147	hard gray rock

Well Completion Report for the Active Domestic Well

50-ft cement seal

TOTAL DEPTH OF BORING 147 Feet
TOTAL DEPTH OF COMPLETED WELL 146 Feet

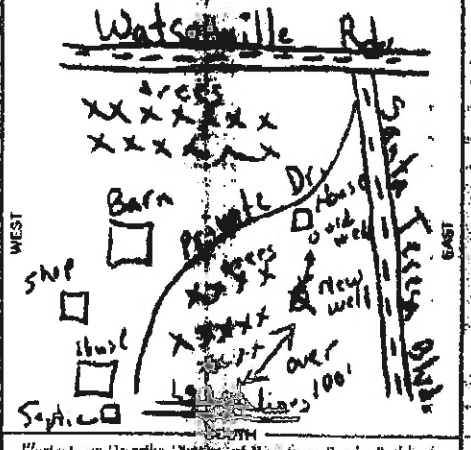
WELL OWNER

Name E. Jones
Mailing Address Santa Teresa Blvd.
City Morgan Hill State CA 95037

WELL LOCATION

Address 14905 Santa Teresa
City Morgan Hill
County Santa Clara
APN Book 719 Page 02 Parcel 007
Township Range Section
Latitude DEG MIN SEC NORTH Longitude DEG MIN SEC

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map (Sketch and paper if necessary) PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
Deepen
Other (Specify)
DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE

WATER SUPPLY
X Domestic Irrigation
MONITORING
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDIATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 50 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 50 (Ft.) & DATE MEASURED
ESTIMATED YIELD * 25 (GPM) & TEST TYPE airlift
TEST LENGTH (Hrs.) TOTAL DRAWDOWN (Ft.)
* May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	ANNULAR SEAL	PILOT PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	10	X				PVC	5	200	
60	146	[illegible]		X			"	"	"	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	50	X			
50	146				pea [illegible]

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME West Coast Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 1047 Powell St. City Hollister, State CA Zip 9502[illegible]
Signed William O'Brien (WELL DRILLER/AUTHORIZED REPRESENTATIVE) Date Signed 11-10-98 C-57 License No. 39[illegible]

DWR 188 REV. 11-97 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Fuel Leak Case Closure
Cleanup Summary
(Jan-2001)
-

January 9, 2001

Ms. Ruth Jones
14905 Santa Teresa Boulevard
Morgan Hill, CA 95037

Ms. Cheri Scales
5061 Tottenham Court
San Jose, CA 95136

Dear Mses. Jones and Scales:

Subject: Fuel Leak Site Case Closure—Ruth Jones Residence, 14905 Santa Teresa Boulevard, Morgan Hill, CA; Case No. 14-417

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with Chapter 6.75 (Article 4, Section 25299.37[h]). The State Water Resources Control Board adopted this letter on February 20, 1997. As of March 1, 1997, the Santa Clara Valley Water District is required to use this case closure letter for all UST leak sites. We are also transmitting to you the enclosed case closure summary. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site. The subject fuel leak case is closed.

SITE INVESTIGATION AND CLEANUP SUMMARY

Please be advised that the following conditions exist at the site:

- Residual petroleum hydrocarbons exist at the site in soil and groundwater. Although a drinking water supply well (No. 10S03E04K008) is located on the property, analytical results indicate that contamination is limited to former tank area and levels appear to have attenuated below regulatory concern.

If you have any questions, please call Ms. Michelle Martin at (408) 265-2607, extension 2768. Thank you.

Sincerely,

ORIGINAL SIGNED BY

James S. Crowley, P.E.
Engineering Unit Manager
Leaking Underground Storage Tank Oversight Program

Enclosures:
1. Case Closure Letter
2. Case Closure Summary

cc: Mr. Chuck Headlee (w/enc)
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Mr. Jim Blamey
Santa Clara County Health Department
2220 Moorpark Avenue
San Jose, CA 95128-2690

Ms. Carla Lawson
Division of Clean Water Programs
Underground Storage Tank Cleanup Fund
State Water Resources Control Board
P.O. Box 944212
Sacramento, CA 94244-2120

M. Martin (w/orig enc), Database (w/enc)

MM:lcg:FL9482jje

January 9, 2001

Ms. Ruth Jones
14905 Santa Teresa Boulevard
Morgan Hill, CA 95037

Ms. Cheri Scales
5061 Tottenham Court
San Jose, CA 95136

Dear Mses. Jones and Scales:

Subject: Fuel Leak Site Case Closure—Ruth Jones Residence, 14905 Santa Teresa Boulevard, Morgan Hill, CA; Case No. 14-417

This letter confirms the completion of a site investigation and remedial action for the underground storage tank(s) formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank(s) are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, this agency finds that the site investigation and corrective action carried out at your underground storage tank(s) site is in compliance with the requirements of subdivisions (a) and (b) of Section 25299.37 of the Health and Safety Code and with corrective action regulations adopted pursuant to Section 25299.77 of the Health and Safety Code and that no further action related to the petroleum release(s) at the site is required.

This notice is issued pursuant to subdivision (h) of Section 25299.37 of the Health and Safety Code.

Please contact our office if you have any questions regarding this matter.

Sincerely,

ORIGINAL SIGNED BY

James S. Crowley, P.E.
Engineering Unit Manager
Leaking Underground Storage Tank Oversight Program

FL9482jje

Santa Clara Valley Water District

CASE CLOSURE SUMMARY
LEAKING UNDERGROUND FUEL STORAGE TANK PROGRAM

I. AGENCY INFORMATION

Date: November 28, 2000

Agency Name: Santa Clara Valley Water District	Address: 5750 Almaden Expressway
City/State/Zip: San Jose, CA 95118	Phone: (408) 265-2600
Responsible Staff Person: Michelle Martin	Title: Assistant Engineer

II. CASE INFORMATION

Site Facility Name: Ruth Jones Residence		
Site Facility Address: 14905 Santa Teresa Boulevard, Morgan Hill, CA 95037		
RB LUSTIS Case No.: —	Local Case No.: 10S3E04K01f	LOP Case No.: 14-417
URF Filing Date: 07/29/97	SWEEPS No.: —	APN: 779-02-003

Responsible Parties	Addresses	Phone Number
Ms. Ruth Jones	14905 Santa Teresa Boulevard, Morgan Hill, CA 95037	(408) 779-5947
Ms. Cheri Scales	5061 Tottenham Court, San Jose, CA 95136	(408) 226-7855

Tank I.D. No	Size in Gallons	Contents	Closed In Place/Removed?	Date
1	1,000	Gasoline	Removed	05/29/97
2-AST[1]	500	Gasoline	Removed	05/29/97
Piping (not reported)			—	—

[1]Aboveground storage tank

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and Type of Release: Unknown		
Site characterization complete? Yes	Date Approved By Oversight Agency: 11/17/00	
Monitoring wells installed? Yes	Number: 4	Proper screened interval? Yes
Highest GW Depth Below Ground Surface: 12.51	Lowest Depth: 24.25	Flow Direction: Northeast
Most Sensitive Current Use: Potential drinking water resource		

Summary of Production Wells in Vicinity: There are 21 active production wells (10S03E04F004, F005, G004, L003–L007, K001, K003, K006, K008, P001–P004, and P008–P012), two destroyed wells (10S03E04G005 and K007), and two inactive wells (10S03E04L002 and K002). The closest wells (K007 and K008) are approximately 80 feet from the contaminant plume. However, site investigation evidence indicate that K007 is no longer a preferential pathway because it has been properly destroyed and K008 is properly sealed and does not appear to be a preferential pathway for dissolved contamination.	
Are drinking water wells affected? Yes	Aquifer Name: Santa Clara Valley Water Basin
Is surface water affected? No	Nearest SW Name: Llagas Creek, ±870 feet southeast
Off-Site Beneficial Use Impacts (Addresses/Locations): None	
Reports on file? Yes	Where are reports filed? Santa Clara Valley Water District

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL

Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	Two steel	Disposal; Erickson, Richmond, CA	05/29/97
Piping	Not reported	—	—
Free Product	—	—	—
Soil	—	—	—
Groundwater	—	—	—
Barrels	—	—	—

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS—BEFORE AND AFTER CLEANUP

Contaminant	Soil (ppm)		Water (ppb)		Contaminant	Soil (ppm)		Water (ppb)	
	Before	After	Before	After		Before	After	Before	After
TPH (Gas)	6,300	220	590,000	5,900	Xylene	850	17	49,000	670
TPH (Diesel)	—	—	—	—	Ethylbenzene	150	0.77	9,000	260
Benzene	14	0.008	910	18	Oil & Grease	—	—	—	—
Toluene	420	0.045	16,000	20	Heavy Metals	—	—	—	—
Other (8240/8270)	—	—	—	—	MTBE (if not analyzed, explain below)	4.8	0.027	27	<50

Description of Interim Remediation Activities: None

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Yes		
Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? Yes		
Does corrective action protect public health for current land use? Santa Clara Valley Water District staff does not make specific determinations concerning public health risk. However, it does not appear that the release would present a risk to human health.		
Site Management Requirements: None		
Should corrective action be reviewed if land use changes? No		
Monitoring Wells Decommissioned: No	Number Decommissioned: 0	Number Retained: 4
List Enforcement Actions Taken: None		
List Enforcement Actions Rescinded: None		

V. ADDITIONAL COMMENTS, DATA, ETC.

Considerations and/or Variances:

1997 In March, the residence water supply well was sampled due to gasoline odors detected in water. Water analysis indicated that the well water was contaminated with levels up to 280 parts per billion (ppb) Total Petroleum Hydrocarbons as Gasoline (TPHG), 2.1 ppb Benzene, 1.2 ppb ppb Toluene, 1.8 ppb Ethylbenzene, 41 ppb Xylenes, with Methyl-tert Butyl Ether (MTBE) below the detection limits of 5 ppb. Shortly after, a Culligan water filtrations system was installed at the residence.

1997 One underground storage tank (UST) and one aboveground storage tank (1,000-gallon gasoline and one 500-gallon gasoline, respectively) were removed from the site in May. Chemical analysis of soil samples taken at the bottom of the tank pit excavation and nearby test pits indicated that contamination was up to 6,300 parts per million (ppm) TPHG, 14 ppm Benzene, 420 ppm Toluene, 150 ppm Ethylbenzene, 850 ppm Xylenes, and 4.8 ppm MTBE.

1998 On October 23, a new water production was installed on the site.

1999 In March, three monitoring wells (MW1 through MW3) were installed to determine groundwater flow direction and determine the extent of groundwater contamination. Soil analysis indicated that up to 220 ppm TPHG, 0.008 ppm Benzene, 0.045 ppm Toluene, 0.77 ppm Ethylbenzene, 17 ppm Xylenes, and 0.027 ppm MTBE was detected. The maximum contamination concentrations detected in groundwater was 18,000 ppb TPHG, 22 ppb Benzene, 67 ppb Toluene, 320 ppb Ethylbenzene, 3,000 ppb Xylenes, and MTBE below the detection limits.

Also, a water sample retrieved from the kitchen sink indicated that up to 330 ppb TPHG, 0.67 ppb Toluene, 3.3 ppb Xylenes, and 27 ppb MTBE was detected. Further sampling showed that the contamination in water to the kitchen attenuated and is now currently below the detection limits.

1999 On August 3, an additional monitoring well (MW-4) was installed to provide sentry support to the new water production well. There was no soil analysis, and the water sample collected from the well indicated that all constituents of concern were below the detection limits.

Conclusion:

Based upon the results of confirmation borings, petroleum hydrocarbon contamination in soil currently exists (220 ppm TPHG, 0.008 ppm Benzene, 0.045 ppm Toluene, 0.77 ppm Ethylbenzene, 17 ppm Xylenes, and 0.027 ppm MTBE). Groundwater is currently impacted (5,900 ppb TPHG, 18 ppb Benzene, 20 ppb Toluene, 670 ppb Xylene, and 260 ppb); however, the extent of dissolved contamination appears to be localized in the area adjacent to the former UST.

Therefore, Santa Clara Valley Water District staff has concluded that a continuing threat to groundwater, human health, and the environment from residual petroleum hydrocarbons does not exist at this site and that Regional Water Quality Control Board objectives have not been compromised. The investigation was performed in accordance with state and local guidelines. Santa Clara Valley Water District staff recommends closure for this case.

VI. LOCAL AGENCY REPRESENTATIVE DATA

Prepared by: Michelle Martin	Title: Assistant Engineer
Signature: Michelle Martin	Date: 11-30-00
Approved by: James S. Crowley, P.E.	Title: Engineering Unit Manager
Signature: James S. Crowley	Date: 12-4-00

This closure approval is based upon the available information and with the provision that the information provided to this agency was accurate and representative of site conditions.

VII. REGIONAL BOARD NOTIFICATION

Regional Board Staff Name: Chuck Headlee	Title: Engineering Geologist
RB Response: Concur, based solely upon information contained in this case closure summary.	Date Submitted to RB:
Signature: SEE ATTACHED SHEET	Date:

Attachments:

1. Site Maps
2. Soil Analytical
3. Groundwater Analysis

This document and the related CASE CLOSURE LETTER, shall be retained by the lead agency as part of the official site file.

VII. REGIONAL BOARD NOTIFICATION

14905 Santa Teresa Blvd

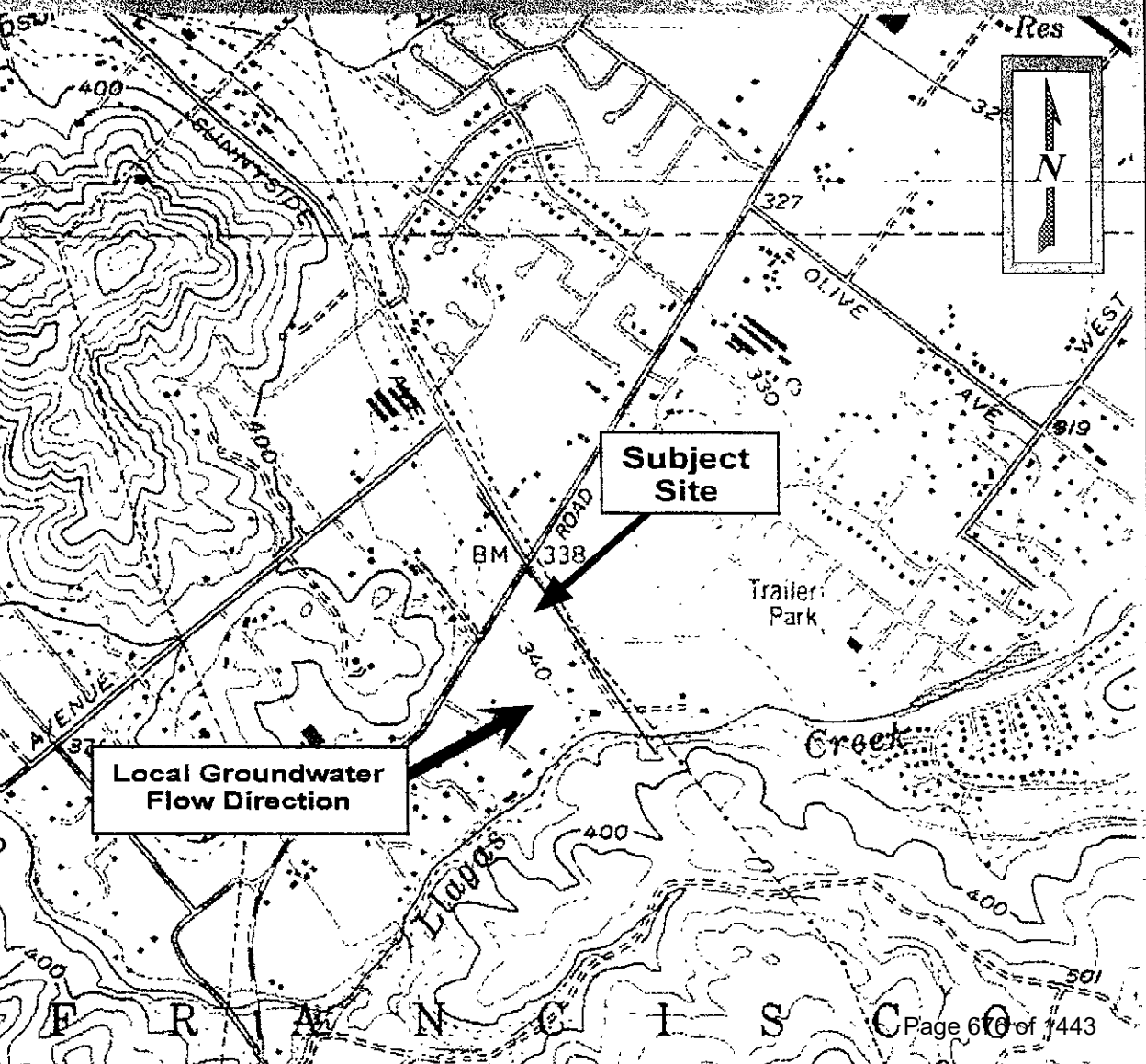
Regional Board Staff Name: Chuck Headlee	Title: Engineering Geologist
RB Response: Concur, based solely upon information contained in this case closure summary.	Date Submitted to RB: 12/8/00
Signature: Chuck Headlee	Date: 12/14/00

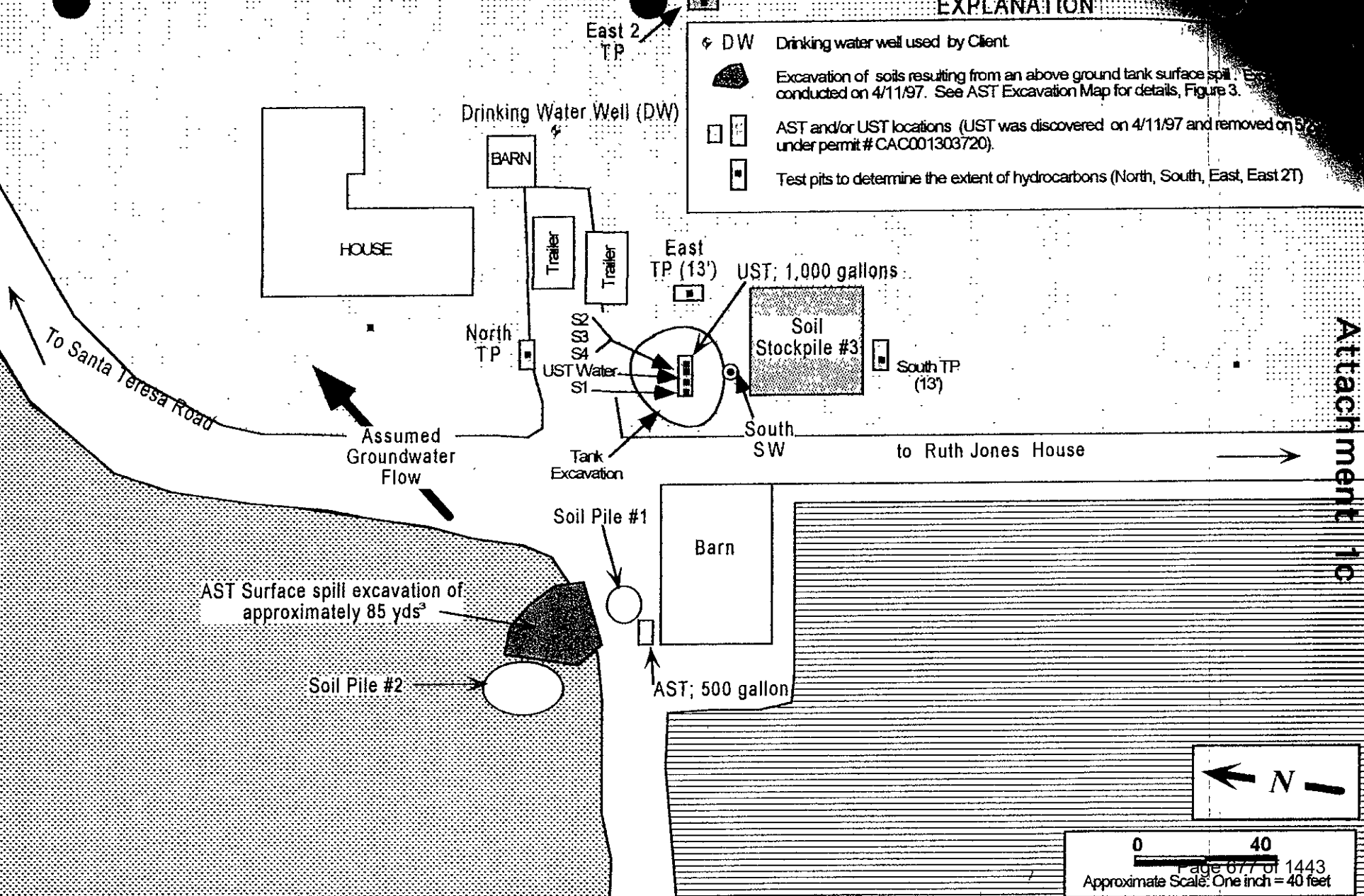
Attachments:

1. Site Maps
2. Soil Analytical
3. Groundwater Analysis

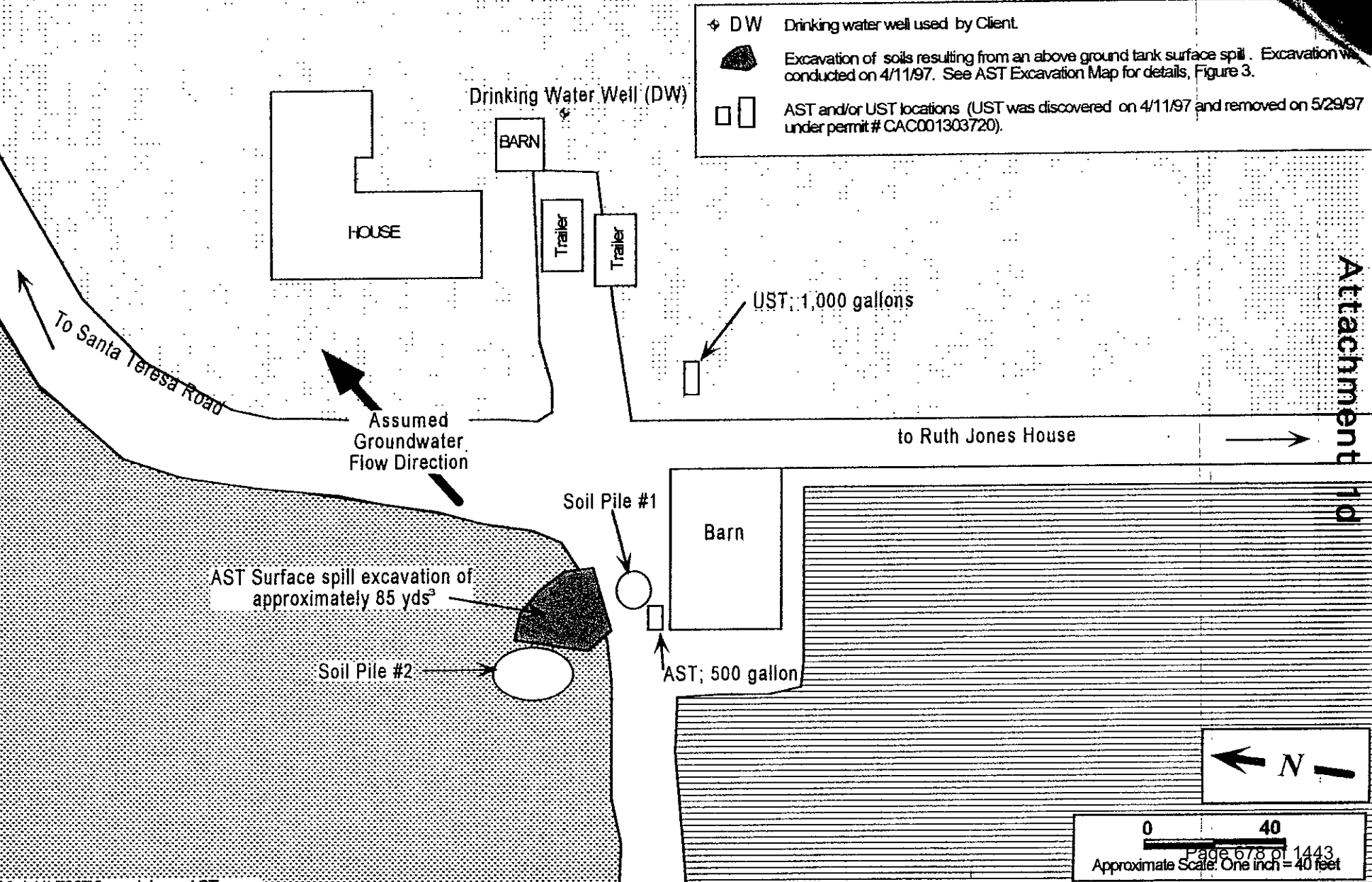
This document and the related CASE CLOSURE LETTER, shall be retained by the lead agency as part of the official site file.

Post-it® Fax Note 7671 | Date | # of pages ▶
To Michelle Martin | From Chuck Headlee
Co./Dept. | Co.
Phone # | Phone #
Fax # (408) 267-5657 | Fax #


Subject Site
Local Groundwater Flow Direction
N
Res
SUNNYSIDE
OLIVE
AVE
WEST
ROAD
AVENUE
BM 338
Trailer Park
Creek
Lloyds
400
340
327
330
319
501
F R A N C I S C O



Attachment 11c



Attachment 1d

EXPLANATION

MW-1 (Elevation: 84.88') = Well Designation and Groundwater Elevation

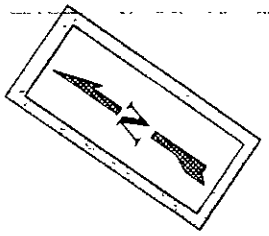
= Groundwater Monitoring Well

= Water Supply Well

85.4 = Estimated groundwater elevation contours (in feet)

Note: Monitoring wells screened from 7 to 22 feet bgs, OLD SW screened from ground surface to 70 feet bgs, NEW SW screened from 60 to 146 feet bgs. Since NEW SW is screened much deeper than all other wells, it was not used for contounng groundwater elevations.

SANTA TERESA ROAD



MW-1 (Elevation: 84.85')

Fence

84.9

85.0

85.1

85.2

85.3

85.4

85.5

85.6

85.7

85.8

85.9

86.0

86.1

86.2

NEW SW (Elevation: 83.69')

MW-4 (Elevation: 85.08')

OLD SW Well Abandoned

Shed

Old House (vacant)

Old Orchard

Former UST

MW-2 (Elevation: 85.73')

Driveway

To Current Residence

Former AST

Old Orchard

MW-3 (Elevation: 86.27')

Calculated Groundwater Flow Direction

0' 40'

Scale in feet

Table 1
Undergroundground Tank Sampling Results
Ruth Jones Residence UST

Sample	Depth (ft.)	TPH-Gas	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	LEAD
S1	10	ND	ND	ND	ND	0.08	ND	ND
S2	10	8	ND	ND	ND	0.13	ND	ND
S3	12	1,300	3.5	32	24	110	ND	na
S4	15	ND	ND	0.09	0.06	0.3	ND	na
EAST TP	13	34	ND	ND	ND	0.1	ND	na
SOUTH TP	13	ND	ND	ND	ND	ND	ND	na
NORTH TP	13	10	ND	ND	0.09	0.59	ND	na
EAST 2 TP	13	ND	ND	ND	ND	ND	ND	na
COMPOSITE (1234)	N/A	210	ND	1.3	1.6	9	ND	na
UST WATER*	13	410,000	910	13,000	8,600	42,000	ND	na
DOMESTIC WELL* (3/6/97)	13	280	2.1	1.2	1.8	41	ND	na
DOMESTIC WELL* (4/11/97	13	3,100	17	30	69	560	ND	na

All soil concentration results are measured in micrograms per gram (ug/g = parts per million [ppm])

*All water concentration results are measured in micrograms per liter (ug/L = parts per billion [ppb])

ND None Detected
na not analyzed

Attachment 2

Table 1
Aboveground Tank Sampling Results
Ruth Jones Residence AST

Sample	Depth (ft.)	TPH-Gas	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
T2A	2	ND	ND	ND	ND	ND	ND
T2C*	5	6,300	14	420	140	850	ND
T2F*	9	6,000	13	360	150	740	ND
T2 Water* (ug/L , PPB)	13.5	590,000	ND	16,000	9,000	49,000	ND
Sidewall North (SWN)	11	ND	0.1	0.23	0.05	0.51	4.8
Sidewall South (SWS)	11	ND	ND	ND	ND	ND	ND
Sidewall East (SWE)	11	ND	ND	0.1	ND	0.26	0.6
Sidewall West (SWW)	11	ND	ND	ND	ND	ND	ND

All concentrations except T2 Water are micrograms per gram (ug/g = parts per million [ppm])
* indicates Elevated Detection Levels, see Appendix A

TABLE 2
Soil Sample Concentration Data
14905 Santa Teresa Road, Morgan Hill, California - Project # H7007.D

Sample ID	*Date*	*Depth (feet)*	*TPH-g (mg/Kg)*	*B (mg/Kg)*	*T (mg/Kg)*	*E (mg/Kg)*	*X (mg/Kg)*	*MTBE (mg/Kg)*
B-1-6'	03/17/99	6	ND	0.008	0.008	0.006	0.026	0.027
B-1-11'	03/17/99	11	ND	ND	ND	ND	0.013	0.021
B-2-6'	03/17/99	6	ND	ND	ND	ND	ND	0.010
B-2-11'	03/17/99	11	** 220	0.005	0.045	0.77	17	0.020
B-3-6'	03/17/99	6	ND	ND	ND	ND	ND	0.017
B-3-11'	03/17/99	11	ND	ND	ND	ND	ND	0.014
Practical Quantitation Limit (ND):			0.5	0.005	0.005	0.005	0.010	0.005

Notes :

TPH-g : Total Petroleum Hydrocarbons as gasoline

BTEX : B = Benzene; T = Toluene; E = Ethylbenzene; and X = total Xylenes

MTBE : Methyl Tertiary Butyl Ether - confirmed by GC/MS method 8260

mg/Kg : Milligram per Kilogram (parts per million)

ND : Not detected at or above the lab's practical quantitation limit

** : Does not match gasoline pattern

Complete Laboratory Analytical Results are presented in Appendix E

Well I.D.	Date	TOC Elevation*	DTW (feet)	GWE (feet)	TPH-g (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE (ug/L)	EDB (ug/L)	1,2-DCA (ug/L)	Fuel Ox. (ug/L)	DO (mg/L)
Old Supply Well		98.26	Supply Well Abandoned (grouted with neat cement to ground surface)											
	08/11/99		13.03	85.23	ND	ND	ND	ND	ND	ND	--	--	ND	2.4
	07/07/99		13.01	85.25	ND	ND	ND	ND	ND	ND	--	--	ND	2.9
	06/07/99		12.89	85.37	ND	ND	ND	ND	ND	ND	--	--	ND	2.7
	04/30/99		12.67	85.59	--	--	--	--	--	--	--	--	--	--
	04/05/99		12.52	85.74	--	--	--	--	--	--	--	--	--	--
	03/30/99		12.51	85.75	--	--	--	--	--	--	--	--	--	--
	04/11/97		--	--	3,100	17	30	69	560	ND	--	--	--	--
	03/06/97		--	--	280	2.1	1.2	1.8	41	ND	--	--	--	--
Kitchen Sink **		---												
	09/08/00		---	---	--	--	--	--	--	--	--	--	--	--
	05/02/00		---	---	--	--	--	--	--	--	--	--	--	--
	01/27/00		---	---	--	--	--	--	--	--	--	--	--	--
	11/02/99		---	---	--	--	--	--	--	--	--	--	--	--
	08/11/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	07/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	04/30/99		---	---	--	--	--	--	--	--	--	--	--	--
	04/05/99		---	---	--	--	--	--	--	--	--	--	--	--
	03/30/99		---	---	330	ND	0.67	ND	3.3	27	ND	ND	ND	--
Yard		---												
	09/08/00		---	---	ND	ND	ND	ND	ND	ND	--	--	--	4.5
	05/02/00		---	---	ND	ND	ND	ND	ND	ND	--	--	--	3.3
	01/27/00		---	---	ND	ND	ND	ND	ND	ND	--	--	--	--
	11/02/99		---	---	ND	ND	ND	ND	ND	ND	--	--	--	--
	08/11/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	07/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	04/30/99		---	---	180	ND	ND	ND	ND	2	--	--	--	--
	04/05/99		---	---	ND	ND	ND	ND	ND	9	--	--	--	--
	03/30/99		---	---	--	--	--	--	--	--	--	--	--	--
Tank		---												
	09/08/00		---	---	--	--	--	--	--	--	--	--	--	--
	05/02/00		---	---	--	--	--	--	--	--	--	--	--	--
	01/27/00		---	---	--	--	--	--	--	--	--	--	--	--
	11/02/99		---	---	--	--	--	--	--	--	--	--	--	--
	08/11/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	07/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
Practical Quantitation Limit (ND):					50	0.5	0.5	0.5	0.5	5	1	0.5	Varies	Field
Regulatory Cleanup Levels (MCL's/AL's)					Not Established	1	150	700	1,750	5	0.05	0.5	Not Established	Instrument

Notes
TOC - Top of Casing
DTW Depth to Water (below TOC) - groundwater monitoring well casings extend approximately 2 to 3 feet above the ground surface
GWE Groundwater Elevation

Attachment 3

Groundwater Elevation and [redacted]er Sample Concentration Data

14905 Santa Teresa Road, Morgan Hill, California - Project # H7007.Q

Well I.D.	Date	TOC Elevation*	DTW (feet)	GWE (feet)	TPH-g (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE (ug/L)	EDB (ug/L)	1,2-DCA (ug/L)	Fuel Ox. (ug/L)	DO (mg/L)
MW-1		100.00												
	09/08/00		15.15	84.85	ND	ND	ND	ND	ND	ND	--	--	--	4.5
	05/02/00		14.72	85.28	ND	ND	ND	ND	ND	ND	--	--	--	3.3
	01/27/00		13.05	86.95	ND	ND	ND	ND	ND	ND	--	--	--	4.9
	11/02/99		15.12	84.88	ND	ND	ND	ND	ND	ND	--	--	--	4.1
	08/11/99		15.12	84.88	ND	ND	ND	ND	ND	ND	--	--	ND	5.6
	07/07/99		14.74	85.26	ND	ND	ND	ND	ND	ND	--	--	ND	4.8
	06/07/99		14.96	85.04	ND	ND	ND	ND	ND	ND	--	--	ND	4.5
	04/30/99		14.74	85.26	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.54	85.46	--	--	--	--	--	--	--	--	--	--
	03/30/99		14.53	85.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6
MW-2		100.95												
	09/08/00		15.22	85.73	5,900	18	20	260	670	<50	--	--	--	2.4
	05/02/00		14.83	86.12	6,100	6.2	22	260	760	<25	--	--	--	2.1
	01/27/00		13.26	87.69	1,200	3.2	1.7	19	41	ND	--	--	--	2.2
	11/02/99		15.19	85.76	9,800	< 25	< 25	350	1,000	< 250	--	--	--	1.6
	08/11/99		15.20	85.75	1,100	0.95	1.7	20	61	ND	--	--	ND	0.8
	07/07/99		15.19	85.76	11,000	27	33	390	1,200	ND	--	--	ND	0.6
	06/07/99		15.09	85.86	9,800	20	40	390	1,200	ND	--	--	ND	0.6
	04/30/99		14.87	86.08	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.82	86.13	--	--	--	--	--	--	--	--	--	--
	03/30/99		14.68	86.27	18,000	22	67	320	3,000	ND	ND	ND	ND	1.5
MW-3		101.06												
	09/08/00		14.79	86.27	ND	ND	1.8	ND	ND	ND	--	--	--	4.0
	05/02/00		14.39	86.67	ND	ND	ND	ND	ND	ND	--	--	--	3.4
	01/27/00		12.85	88.21	ND	ND	ND	ND	ND	ND	--	--	--	4.4
	11/02/99		14.74	86.32	ND	ND	ND	ND	ND	ND	--	--	--	4.1
	08/11/99		14.73	86.33	ND	ND	ND	ND	ND	ND	--	--	ND	4.6
	07/07/99		15.09	85.97	110	ND	ND	ND	1.0	ND	--	--	ND	4.6
	06/07/99		14.63	86.43	74	ND	ND	ND	ND	ND	--	--	ND	4.4
	04/30/99		14.43	86.63	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.28	86.78	--	--	--	--	--	--	--	--	--	--
	03/30/99		14.22	86.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3
MW-4		99.95												
	09/08/00		14.87	85.08	ND	ND	ND	ND	ND	ND	--	--	--	5.4
	05/02/00		14.49	85.46	ND	ND	ND	ND	ND	ND	--	--	--	3.4
	01/27/00		12.93	87.02	ND	ND	ND	ND	ND	ND	--	--	--	5.1
	11/02/99		14.82	85.13	ND	ND	ND	ND	ND	ND	--	--	--	5.0
	08/11/99		14.80	85.15	ND	ND	ND	ND	ND	ND	--	--	ND	6.3
New Supply Well		98.47												
	09/08/00		14.78	83.69	ND	ND	ND	ND	ND	ND	--	--	--	6.2
	05/02/00		na	na	ND	ND	ND	ND	ND	ND	--	--	--	3.8
	01/27/00		na	na	ND	ND	ND	ND	ND	ND	--	--	--	--
	11/02/99		15.17	83.30	ND	ND	ND	ND	ND	ND	--	--	--	3.6
	08/11/99		24.25	74.22	ND	ND	ND	ND	ND	ND	--	--	ND	4.9
	07/07/99		14.70	83.77	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		14.64	83.83	ND	ND	ND	ND	ND	ND	--	--	ND	3.3
	04/30/99		13.87	84.60	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.89	83.58	ND	ND	ND	ND	ND	ND	--	--	--	--
	03/30/99		14.88	83.59	--	--	--	--	--	--	--	--	--	--
	Practical Quantitation Limit (ND):				50	0.5	0.5	0.5	0.5	5	1	0.5	Varies	Field
	Regulatory Cleanup Levels (MCL's/AL's)				Not Established	1	150	700	1,750	5	0.05	0.5	Not Established	Instrument

FILE: UST; 13425 Monterey Hwy, Morgan Hill JAY - FYI

STATE OF CALIFORNIA--HEALTH AND HUMAN SERVICES AGENCY
GRAY DAVIS, Governor

DEPARTMENT OF HEALTH SERVICES
DRINKING WATER FIELD OPERATIONS BRANCH
2151 BERKELEY WAY, ROOM 458
BERKELEY, CA 94704-1011
(510) 540-2158 FAX (510) 540-2152

February 6, 2001

Mr. Roger W. Briggs, Executive Officer
California Regional Water Quality Control Board, Central Coast Region
81 Higuera Street, Suite 200
San Luis Obispo, CA 93401-5427

01 FEB -8 PM 1:01
CENTRAL COAST REGIONAL WATER QUALITY CONTROL BD
RECEIVED

Dear Mr. Briggs:

UNDERGROUND STORAGE TANK SITES LOCATED IN SANTA CLARA COUNTY

This is to inform you that the Department of Health Services, Drinking Water Field Operations Branch (Department) has received your letter dated January 12, 2001 in regards to MTBE detections in ground water at Underground Storage Tank (UST) sites. The Department has performed a review of the 4 UST sites located in Santa Clara County, and has the following comments:

1. San Martin Tire, located at 13425 Monterey Highway in San Martin, is a public water system regulated by our Department. Their only potable water supply well is located less than 200 feet from the site of their leaking underground storage tank, and therefore is in Investigation Priority Class "A". Enclosed with this letter is a map of the San Martin Tire site that indicates the location of the water supply well (Producing Well) in relation to the UST.

2. The City of Morgan Hill Corporation Yard located at 105 Edes Court has been determined to be in Investigation Priority Class "B" as the nearest City receptor, Tennant Well, is approximately 2,625 feet away. Economy Inn, also regulated by our Department, is located at 15080 Monterey Highway approximately 1,600 feet from the Corporation Yard. Economy Inn has a well with ion-exchange treatment to reduce nitrate concentrations. Therefore, the Investigation Priority Class may be classified as "A".

3. The Shell Service Station located at 17905 Monterey Highway in the City of Morgan Hill has been determined to be in Investigation Priority Class "B" as the nearest City receptor, Main Well, is located approximately 3,250 feet away.

4. The Ruth Jones residence, located at 14905 Santa Theresa Road in the City of Morgan Hill has been determined to be in Investigation Priority Class "C" as the nearest City source, Tennant Well, is located nearly 8,000 feet away.

Please note that the Department only evaluated these UST sites with respect to public water system sources in which our Department regulates. The Department does not have information on the distances of these UST sites from county regulated small water system sources or private wells.

Post-it® Fax Note 7671	Date 2/15/01	# of pages ▶ 3
To LANIE DAVIS	From JOHN MIDDAUGH	
Co./Dept. SCVWD	Co. RWQCB	
Phone # 408-265-2607 x-2	Phone # 805-549-3696	
Fax # 408-267-5057	Fax #	

file w/ Ruth Jones Resid. closure

Should you have any questions regarding this matter, please contact Lincoln King at (510) 540-3009.

Sincerely,

Eric Lacy, P.E.
District Engineer
Santa Clara District
Drinking Water Field Operations Branch

Enclosure: San Martin Tire site map

cc: Santa Clara County Health Department (w/o enclosure)

-

Groundwater Monitoring Report
&
Request for Closure
(October 2000)

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Dr., Watsonville, CA 95076
(831) 722-3580 (831) 662-3100
Fax: (831) 722-1159

October 3, 2000
Project H7007.Q

Ms. Cheri Scales
5061 Tottenham Court
San Jose, California 95136

Subject: Site Closure Request, w/Third Quarter 2000 Groundwater Monitoring Report
Former Ruth Jones Residence, 14905 Santa Teresa Road, Morgan Hill, California

Dear Ms. Scales:

This report presents our Site Closure Request, with the methods and results of the 3rd Quarter 2000 Groundwater Monitoring event. This sampling was performed in September 2000 for a private residence located at 14905 Santa Teresa Road in Morgan Hill, California (Figure 1). This is the 10th overall round of groundwater monitoring, which is being conducted as a result of a release of fuel hydrocarbons (FHCs) from an old underground storage tank (UST) at the site and requests from the Santa Clara Valley Water District (SCVWD) dated June 2, 1999 and June 9, 1999. A complete description of the site layout, regional hydrogeologic setting, and project history is included in a previous report[1].

EXECUTIVE SUMMARY

We respectfully request that the Santa Clara Valley Water District close the underground tank investigation at this site, based on the following information:

- sustained groundwater monitoring showing no hydrocarbons have ever been detected in downgradient wells (MW-1 and MW-4).

-groundwater monitoring showing that the new domestic water well at the site does not contain any hydrocarbons and does not create a measurable groundwater gradient change in the shallow aquifer.

-limited concentrations of aged gasoline with few remaining volatiles in water at well MW-2, at the former underground tank.

- no MTBE detected in groundwater at the site (probably due to the age of the gasoline release and abandonment of the underground tank several decades ago predating the use of MTBE in gasoline),

-the remaining area of groundwater with detectable gasoline contamination is limited to the immediate tank site, is a low threat to regional groundwater, and will naturally degrade.

---

[1]: Weber, Hayes and Associates report: *1st Monthly Groundwater Monitoring and Workplan for Additional Monitoring Well*, dated July 1, 1999.

This is the third of three quarterly monitoring reports requested by the Santa Clara Valley Water District (SCVWD) in their letter dated December 29, 1999 (included as Appendix C). **We are requesting regulatory closure of this site based upon the abovementioned information, and completion of the monitoring schedule requested.**

The 3rd quarter 2000 groundwater monitoring event took place on September 19, 2000 . The most significant findings of this monitoring event are:

- **No hydrocarbons or Methyl Tert Butyl Ether (MTBE) were detected in the domestic water supply system samples (collected from both the Yard faucet and from the water supply well).**

- **No hydrocarbons or MTBE were detected in the groundwater samples collected from monitoring wells MW-1 and 4.**

- **Toluene was detected in MW-3 (at the former above ground storage tank) at a concentration of 1.8 ug/L, far below the regulatory cleanup level. No other hydrocarbons or MTBE were detected in MW-3.**

- **Hydrocarbons detected in well MW-2 (at the former underground storage tank) generally decreased relative to the previous round of sampling. However, benzene, at 18 ug/L, was detected above drinking water standards in well MW-2 (an increase from 6.2 ug/L last quarter). TPH-gasoline decreased from 6,100 ppb to 5,900 ppb. No MTBE was detected in well MW-2. The detection level for MTBE was increased to 50 ug/L due to interference from the gasoline hydrocarbons. However, MTBE has never been detected in groundwater at MW-2, including several rounds of testing with detection levels of 5 ug/L (see Table 1). The underground tank at the site had been abandoned since the 1970's when discovered (WHA, June 19, 1997). The release of gasoline at the site is several decades old, and is believed to predate the use of MTBE in gasoline.**

- **The shallow groundwater gradient direction remains consistent to the northeast, towards MW-1, with no evident influence pumping from the water well New SW.**

This indicates that the domestic water supply is not threatened by the contamination identified in the former UST area (assuming no change to the current groundwater extraction rates or duration from New SW), and that the residual FHCs and additives previously detected in the old domestic water supply well and at the kitchen sink have been successfully flushed and filtered. A new domestic supply well was installed in 1999.

The following presents a brief summary of our findings.

- Groundwater levels in the four monitoring wells at the site dropped an average of 0.40 feet since May 2, 2000.

- Groundwater elevations calculated from the surveyed top-of-casing elevations indicated that shallow groundwater flowed to the northeast towards MW-1 on September 8, 2000. It should be noted that pumping of the new domestic water supply well does not appear to be affecting groundwater elevations within the monitoring well network.

- Groundwater analytical results indicate FHCs were detected in the groundwater sample collected from well MW-2 located adjacent to the former UST **at concentrations that are below the drinking water maximum contaminant levels (MCLs) for toluene, ethylbenzene and xylenes**.

- Benzene at 18 ppb is the only contaminant detected at concentrations above its regulatory cleanup level of 1 ppb (see Table 1).

- Toluene was detected at 1.8 ppb in MW-3. This concentration is far below the Regulatory Cleanup Level. No other FHCs or MTBE were detected in well MW-3.

- No FHCs were detected in monitoring wells MW-1 and MW-4, or from the domestic water supply system samples collected at the Yard faucet and New SW. MTBE was not detected in the groundwater samples collected from **any** of the five on-site wells. Former supply well Old SW was abandoned prior to this monitoring event, and therefore is no longer included in the monitoring program.

- No fuel oxygenates (except MTBE) have ever been detected in any of the groundwater samples or domestic supply system samples collected from the subject site. MTBE has not been detected in water in the last seven rounds of sampling (see Table 1).

The results of this monitoring event show site conditions to be stable. Contaminant concentrations in MW-2 have generally decreased since the last quarterly monitoring event (May 2, 2000, see table 1). Dissolved oxygen measurements indicate that biologic activity is occurring in the former tank location, so natural attenuation should effectively remediate the remaining dissolved FHCs.

This concludes our Executive Summary.

PURPOSE AND SCOPE

This report presents the methods and results of the 3rd quarter groundwater monitoring event performed in September 2000. Monitoring is being conducted relative to a release of FHCs from

a UST at the site and requests from the SCVWD dated June 2, 1999, July 14, 1999, and August 24, 1999. Regulatory correspondence is attached in Appendix C. Our scope of work included:

- Collecting groundwater samples from the four monitoring wells (MW-1, MW-2, MW-3 and MW-4), and from the domestic water supply system at the Yard faucet and New SW;
- Submitting the collected groundwater samples to a state-certified laboratory for analysis of dissolved FHCs; and
- Documenting the field procedures and laboratory results, and interpreting the data in this summary report.

Field methodologies conformed with the guidelines established by the California Water Resources Control Board in their *Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure* (1989) and SCVWD guidelines for UST investigations. A detailed description of our field methodologies for the scope of work performed at the subject site is presented in Appendix A.

QUARTERLY GROUNDWATER MONITORING

The 3rd quarter groundwater monitoring event took place on September 8, 2000. Groundwater samples were collected from monitoring wells MW-1, 2, 3, 4 and from the domestic water supply system at the Yard faucet and from the water supply well, New SW. All samples collected were analyzed at a state-certified analytical laboratory by the following methods:

- TPH-g by EPA method 8015M; and
- BTEX and MTBE by EPA method 8020.

A description of Weber, Hayes and Associates groundwater monitoring field methodologies is presented in Appendix A. Water quality sampling data forms are also included in Appendix A.

Site Hydrogeology

Depth-to-groundwater measurements were combined with well survey data to calculate groundwater elevations at the site. The calculated groundwater elevations indicate that the groundwater beneath the site was flowing to the northeast on September 8, 2000 towards monitoring well MW-1 at an approximate gradient of 0.006 feet/feet (0.6%). However, although the extraction of water from New SW causes fluctuations in the elevation of groundwater in New SW, the water level in well MW-4 located approximately 25 feet from New SW does not appear to be significantly affected by the drawdown in New SW. The addition of monitoring well MW-4 adjacent to New SW confirms that the active pumping from New SW does not significantly impact the groundwater elevations in

the shallow water table. The new domestic supply well (New SW) is screened from 60 to 146 feet below the ground surface (bgs) which is approximately 38 feet deeper than the screen in the monitoring wells which are screened from 7 to 22 feet bgs. Since New SW is screened only across deeper water bearing zones, it was ignored for contouring purposes.

Since the previous groundwater gauging event performed on May 2, 2000 the groundwater levels at the site dropped an average of 0.40 feet, with maximum fluctuations of 0.43 feet since the previous measurements. Depth-to-groundwater measurements, groundwater elevations, and surveyed top of well casing elevations are summarized in Table 1. Groundwater elevation contours, with the New SW elevation not included, are presented on Figure 2.

Groundwater Sample Analytical Results

TPH-g was detected in the groundwater sample collected from well MW-2 at a concentration of 5,900 micrograms per liter (parts per billion [ppb]). Benzene, Toluene, Ethylbenzene and Xylenes were detected in the groundwater sample collected from well MW-2 at concentrations of 18 ppb, 20 ppb, 260 ppb, and 670 ppb respectively. MTBE was not detected in the groundwater sample collected from MW-2. The only contaminant that was detected above the regulatory cleanup level was benzene at 18 ppb. The Maximum Contaminant Limit (MCL) for benzene is 1 ppb.

TPH-g, Benzene, Ethyl benzene, Xylenes, and MTBE were not detected in any of the groundwater samples collected from the remaining monitoring wells at the site including MW-1, 3, 4.

Toluene was detected at 1.8 ppb in MW-3. This is far below the MCL for toluene, which is 150 ppb. Toluene was not detected in any of the samples collected from monitoring wells MW-1 and MW-4.

TPH-g, BTEX, and MTBE were not detected in any of the domestic water supply system samples collected from the subject site at the Yard faucet and from New SW.

A summary of the laboratory analytical results is presented in Table 1 and on Figure 3. The Certified Laboratory Analytical Report is presented in Appendix B.

Dissolved Oxygen Measurements

Dissolved oxygen field measurements were made in the field as an indicator of natural biodegradation of FHCs in groundwater. **Reduced dissolved oxygen levels were measured in well MW-2 relative to the other wells at the site, indicating that biologic activity is occurring in the FHC impacted groundwater.** We assume that microorganisms are using the dissolved FHCs as a food source and depleting dissolved oxygen during aerobic respiration. Dissolved oxygen measurements are summarized on Table 1.

CONCLUSIONS

- Based on the groundwater elevation for MW-4 located adjacent to New SW, we determined that the groundwater gradient in the shallow water bearing zone beneath the site is not significantly affected by the active pumping from the domestic water supply well New SW, and that the groundwater gradient flows to the northeast towards MW-1. However, if the water demand from New SW is increased either by an increase in extraction rate or duration of well pumping (i.e. used for irrigation purposes, larger holding tank, etc.), then the groundwater gradient beneath the site may be impacted by the use of New SW and the domestic water source may be jeopardized.

- Since no significant contamination was detected in any of the perimeter wells, we conclude that the dissolved FHC plume is localized around the former UST area. Dissolved oxygen readings indicate that natural biodegradation of FHCs is occurring within the plume.

RECOMMENDATIONS

- Due to the stability of the site conditions, the limited extent of the dissolved hydrocarbon plume, and the dissolved oxygen data indicating natural attenuation, we believe that no further activities are necessary at the site.

- **We are requesting that this site be reviewed by the regulatory agency (Santa Clara Valley Water District) for closure. Our closure request is based upon current site conditions and the completion of the regulatory requested quarterly monitoring schedule set forth in the SCVWD letter dated December 29, 1999 (included in Appendix C).**

LIMITATIONS

Our service consists of professional opinions and recommendations made in accordance with generally accepted geologic principles and practices. This warranty is in lieu of all others, either expressed or implied. The analysis and conclusions in this report are based on sampling and testing which are necessarily limited. Additional data from future work may lead to modification of the opinions expressed herein.

Thank you for the opportunity to participate in this water quality investigation. If you have any questions or comments regarding this project, please call us at (831) 722 - 3580.

Sincerely yours,

Weber, Hayes and Associates
A California Corporation

By:_____
Joseph Hayes
Certified Engineering Geologist #1629
Certified Hydrogeologist #373

Attachments:

Table 1	Groundwater Elevations and Water Sample Concentration Data
Figure 1	Location Map
Figure 2	Groundwater Elevations & Potentiometric Surface Map September 8, 2000
Figure 3	Petroleum Hydrocarbon Concentration Map September 8, 2000
Appendix A	Field Methodologies Groundwater Sampling Field Data Sheets
Appendix B	Certified Laboratory Analytical Report
Appendix C	Santa Clara Valley Water District Correspondence

TABLE 1

Groundwater Elevation and Water Sample Concentration Data

14905 Santa Teresa Road, Morgan Hill, California - Project # H7007.Q

Well I.D.	Date	TOC Elevation*	DTW (feet)	GWE (feet)	TPH-g (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE (ug/L)	EDB (ug/L)	1,2-DCA (ug/L)	Fuel Ox. (ug/L)	DO (mg/L)
MW-1		100.00												
	09/08/00		15.15	84.85	ND	ND	ND	ND	ND	ND	--	--	--	4.5
	05/02/00		14.72	85.28	ND	ND	ND	ND	ND	ND	--	--	--	3.3
	01/27/00		13.05	86.95	ND	ND	ND	ND	ND	ND	--	--	--	4.9
	11/02/99		15.12	84.88	ND	ND	ND	ND	ND	ND	--	--	--	4.1
	08/11/99		15.12	84.88	ND	ND	ND	ND	ND	ND	--	--	ND	5.6
	07/07/99		14.74	85.26	ND	ND	ND	ND	ND	ND	--	--	ND	4.8
	06/07/99		14.96	85.04	ND	ND	ND	ND	ND	ND	--	--	ND	4.5
	04/30/99		14.74	85.26	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.54	85.46	--	--	--	--	--	--	--	--	--	--
	03/30/99		14.53	85.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6
MW-2		100.95												
	09/08/00		15.22	85.73	5,900	18	20	260	670	<50	--	--	--	2.4
	05/02/00		14.83	86.12	6,100	6.2	22	260	760	<25	--	--	--	2.1
	01/27/00		13.26	87.69	1,200	3.2	1.7	19	41	ND	--	--	--	2.2
	11/02/99		15.19	85.76	9,800	< 25	< 25	350	1,000	< 250	--	--	--	1.6
	08/11/99		15.20	85.75	1,100	0.95	1.7	20	61	ND	--	--	ND	0.8
	07/07/99		15.19	85.76	11,000	27	33	390	1,200	ND	--	--	ND	0.6
	06/07/99		15.09	85.86	9,800	20	40	390	1,200	ND	--	--	ND	0.6
	04/30/99		14.87	86.08	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.82	86.13	--	--	--	--	--	--	--	--	--	--
	03/30/99		14.68	86.27	18,000	22	67	320	3,000	ND	ND	ND	ND	1.5
MW-3		101.06												
	09/08/00		14.79	86.27	ND	ND	1.8	ND	ND	ND	--	--	--	4.0
	05/02/00		14.39	86.67	ND	ND	ND	ND	ND	ND	--	--	--	3.4
	01/27/00		12.85	88.21	ND	ND	ND	ND	ND	ND	--	--	--	4.4
	11/02/99		14.74	86.32	ND	ND	ND	ND	ND	ND	--	--	--	4.1
	08/11/99		14.73	86.33	ND	ND	ND	ND	ND	ND	--	--	ND	4.6
	07/07/99		15.09	85.97	110	ND	ND	ND	1.0	ND	--	--	ND	4.6
	06/07/99		14.63	86.43	74	ND	ND	ND	ND	ND	--	--	ND	4.4
	04/30/99		14.43	86.63	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.28	86.78	--	--	--	--	--	--	--	--	--	--
	03/30/99		14.22	86.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3
MW-4		99.95												
	09/08/00		14.87	85.08	ND	ND	ND	ND	ND	ND	--	--	--	5.4
	05/02/00		14.49	85.46	ND	ND	ND	ND	ND	ND	--	--	--	3.4
	01/27/00		12.93	87.02	ND	ND	ND	ND	ND	ND	--	--	--	5.1
	11/02/99		14.82	85.13	ND	ND	ND	ND	ND	ND	--	--	--	5.0
	08/11/99		14.80	85.15	ND	ND	ND	ND	ND	ND	--	--	ND	6.3
New Supply Well		98.47												
	09/08/00		14.78	83.69	ND	ND	ND	ND	ND	ND	--	--	--	6.2
	05/02/00		na	na	ND	ND	ND	ND	ND	ND	--	--	--	3.8
	01/27/00		na	na	ND	ND	ND	ND	ND	ND	--	--	--	--
	11/02/99		15.17	83.30	ND	ND	ND	ND	ND	ND	--	--	--	3.6
	08/11/99		24.25	74.22	ND	ND	ND	ND	ND	ND	--	--	ND	4.9
	07/07/99		14.70	83.77	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		14.64	83.83	ND	ND	ND	ND	ND	ND	--	--	ND	3.3
	04/30/99		13.87	84.60	--	--	--	--	--	--	--	--	--	--
	04/05/99		14.89	83.58	ND	ND	ND	ND	ND	ND	--	--	--	--
	03/30/99		14.88	83.59	--	--	--	--	--	--	--	--	--	--
Practical Quantitation Limit (ND):					50	0.5	0.5	0.5	0.5	5	1	0.5	Varies	Field
Regulatory Cleanup Levels (MCL's/AL's)					Not Established	1	150	700	1,750	5	0.05	0.5	Not Established	Instrument

TABLE 1

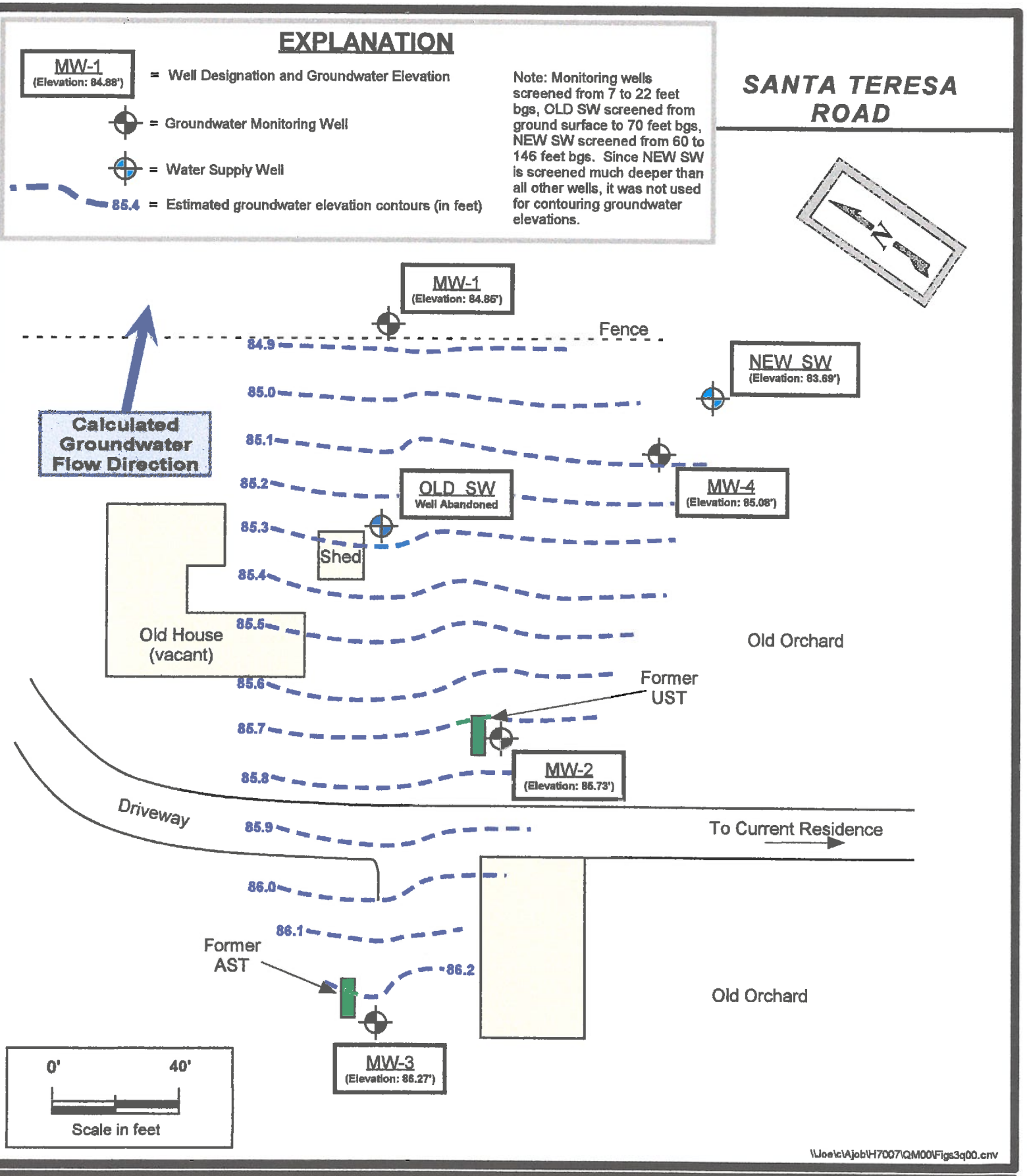
Groundwater Elevation and Water Sample Concentration Data

14905 Santa Teresa Road, Morgan Hill, California - Project # H7007.Q

Well I.D.	Date	TOC Elevation*	DTW (feet)	GWE (feet)	TPH-g (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE (ug/L)	EDB (ug/L)	1,2-DCA (ug/L)	Fuel Ox. (ug/L)	DO (mg/L)
Old Supply Well		98.26												
			Supply Well Abandoned (grouted with neat cement to ground surface)											
	08/11/99		13.03	85.23	ND	ND	ND	ND	ND	ND	--	--	ND	2.4
	07/07/99		13.01	85.25	ND	ND	ND	ND	ND	ND	--	--	ND	2.9
	06/07/99		12.89	85.37	ND	ND	ND	ND	ND	ND	--	--	ND	2.7
	04/30/99		12.67	85.59	--	--	--	--	--	--	--	--	--	--
	04/05/99		12.52	85.74	--	--	--	--	--	--	--	--	--	--
	03/30/99		12.51	85.75	--	--	--	--	--	--	--	--	--	--
	04/11/97		--	--	3,100	17	30	69	560	ND	--	--	--	--
	03/06/97		--	--	280	2.1	1.2	1.8	41	ND	--	--	--	--
Kitchen Sink **		---												
	09/08/00		---	---	--	--	--	--	--	--	--	--	--	--
	05/02/00		---	---	--	--	--	--	--	--	--	--	--	--
	01/27/00		---	---	--	--	--	--	--	--	--	--	--	--
	11/02/99		---	---	--	--	--	--	--	--	--	--	--	--
	08/11/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	07/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	04/30/99		---	---	--	--	--	--	--	--	--	--	--	--
	04/05/99		---	---	--	--	--	--	--	--	--	--	--	--
	03/30/99		---	---	330	ND	0.67	ND	3.3	27	ND	ND	ND	--
Yard		---												
	09/08/00		---	---	ND	ND	ND	ND	ND	ND	--	--	--	4.5
	05/02/00		---	---	ND	ND	ND	ND	ND	ND	--	--	--	3.3
	01/27/00		---	---	ND	ND	ND	ND	ND	ND	--	--	--	--
	11/02/99		---	---	ND	ND	ND	ND	ND	ND	--	--	--	--
	08/11/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	07/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	04/30/99		---	---	180	ND	ND	ND	ND	2	--	--	--	--
	04/05/99		---	---	ND	ND	ND	ND	ND	9	--	--	--	--
	03/30/99		---	---	--	--	--	--	--	--	--	--	--	--
Tank		---												
	09/08/00		---	---	--	--	--	--	--	--	--	--	--	--
	05/02/00		---	---	--	--	--	--	--	--	--	--	--	--
	01/27/00		---	---	--	--	--	--	--	--	--	--	--	--
	11/02/99		---	---	--	--	--	--	--	--	--	--	--	--
	08/11/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	07/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
	06/07/99		---	---	ND	ND	ND	ND	ND	ND	--	--	ND	--
Practical Quantitation Limit (ND):					50	0.5	0.5	0.5	0.5	5	1	0.5	Varies	Field
Regulatory Cleanup Levels (MCL's/AL's)					Not Established	1	150	700	1,750	5	0.05	0.5	Not Established	Instrument

Notes :

TOC : Top of Casing
DTW : Depth to Water (below TOC) - groundwater monitoring well casings extend approximately 2 to 3 feet above the ground surface
GWE : Groundwater Elevation
TPH-g : Total Petroleum Hydrocarbons as gasoline
BTEX : B: Benzene, T: Toluene, E: Ethyl benzene; and X: Total xylenes
MTBE : Methyl Tertiary Butyl Ether - confirmed by EPA Method 8260
EDB : 1, 2-Dibromoethane, also known as ethylene dibromide
1,2-DCA : 1, 2-Dichloroethane, also known as ethylene dichloride (EDC)
Fuel Ox. : Fuel Oxygenates: Ethanol; Di-isopropyl Ether; Tertiary Butyl Alcohol, also known as tributyl alcohol; Ethyl-tertiary-butyl-Ether; Tert-Amyl Methyl Ether by EPA Method 8260
DO : Measured Dissolved Oxygen
ug/L : Microgram per liter (parts per billion)
mg/L : Milligram per liter (parts per million)
ND : Not detected at or above the lab's practical quantitation limit (PQL)
<X : Not detected at the elevated PQL, X (PQL elevated due to laboratory dillution)
na: Not Available
-- : Not analyzed for this method during this sampling period
--- : Not applicable
MCL's/AL's : Maximum Contaminant Limits or Action Levels, which are the regulatory cleanup levels established in the California Code of Regulations (Title 22)
All compounds have MCL's except for MTBE which is an Action Level (recommended) set by the California DHS (3/99)
* : TOC = Top of casing elevation measured by Professional Surveyors to an on-site datum (100.00')
** : Water sample collected from Kitchen Sink on 3/30/99 was also analyzed for Title 22 Public Health Drinking Water Parameters



Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, Ca. 95076
(831) 722 - 3580 (831) 662 - 3100

GROUNDWATER ELEVATIONS & POTENTIOMETRIC SURFACE MAP
September 8, 2000
14905 Santa Teresa Rd., Morgan Hill, CA.

FIGURE 2
Job # H7007.Q

EXPLANATION

MW-1
TPH-g: ND
B: ND
T: ND
E: ND
X: ND
MTBE: ND
D.O.: 4.1 mg/L

= Well Designation with Contaminant Concentrations in micrograms per liter (ppb) and Dissolved Oxygen (D.O.) in milligrams per liter: Total Petroleum Hydrocarbons as Gasoline (TPH-g); Benzene (B), Toluene (T), Ethylbenzene (E) & Xylenes (X); Methyl-tert-Butyl-Ether (MTBE).

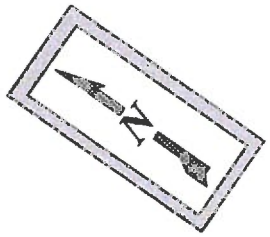
ND = Non Detectable - concentrations below laboratory practical quantitation limit (PQL)

< X = Not Detected at the elevated PQL, X (PQL elevated due to laboratory dilution)

= Groundwater Monitoring Well

= Water Supply Well

SANTA TERESA ROAD



Fence

MW-1
TPH-g: ND
B: ND
T: ND
E: ND
X: ND
MTBE: ND
D.O.: 4.5 mg/L

NEW SW
TPH-g: ND
B: ND
T: ND
E: ND
X: ND
MTBE: ND
D.O.: 8.2 mg/L

OLD SW
Well Abandoned

Shed

MW-4
TPH-g: ND
B: ND
T: ND
E: ND
X: ND
MTBE: ND
D.O.: 5.4 mg/L

Old House (vacant)

Former UST

MW-2
TPH-g: 5,900 ug/L
B: 18 ug/L
T: 20 ug/L
E: 260 ug/L
X: 670 ug/L
MTBE: < 50 ug/L
D.O.: 2.4 mg/L

Old Orchard

Calculated Groundwater Flow Direction

Driveway

To Current Residence

Former AST

Barn

MW-3
TPH-g: ND
B: ND
T: 1.8 ug/L
E: ND
X: ND
MTBE: ND
D.O.: 4.0 mg/L

Old Orchard

0' 40'

Scale in feet

\\Joe\c\Ajob\H7007\QM00\Figs3q00.cnv

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, Ca. 95076
(831) 722 - 3580 (831) 662 - 3100

PETROLEUM HYDROCARBON CONCENTRATION MAP
September 8, 2000
14905 Santa Teresa Rd., Morgan Hill, CA.

FIGURE 3
Job # H7007.Q

-

Aboveground Storage Tank (AST) Investigation Report (June 1997)

Weber, Hayes & Associates
Engineering Geology and Hydrogeology
120 Westgate Dr., Watsonville, CA 95076
408) 722-3580 (408) 662-3100
Fax: (408) 722-1159

June 18, 1997

ABOVEGROUND STORAGE TANK INVESTIGATION

Ruth Jones Residence
14905 Santa Teresa Road, Morgan Hill, CA

PURPOSE AND SCOPE

This letter report presents documentation of field operations and laboratory results for excavation and removal of soil contamination near a former Aboveground Storage Tank (AST) at the Ruth Jones residence (see Location Map, Figure 1). Weber, Hayes and Associates was hired to oversee the AST investigation. A workplan describing the proposed soil excavation and sampling was submitted to the Santa Clara Valley Water District (Weber, Hayes and Associates, 4/9/97). The completed scope of work included:

- Excavating two exploratory trenches, and locating surficial soil contamination from AST spill.
- Excavating approximately 85 cubic yards of gasoline-contaminated soil.
- Obtaining soil and water samples for laboratory analysis, as per State and Local guidelines.
- Presenting the analytical results, chain of custody, and site map in this summary report.

All field operations conformed with guidelines established by the California Water Resources Control Board in their *Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure* (1989) and Santa Clara Valley Water District (SCVWD) guidelines for tank investigations. The field work for this AST was conducted prior to the removal and exploratory soil sampling around a 1000 gallon Underground Storage Tank at the same property. The underground tank investigation is described in a separate report (Weber, Hayes and Associates, *Underground Tank Closure Report*, Ruth Jones residence, June 19, 1997), and the UST location is shown on Figure 2.

SITE DESCRIPTION

A steel aboveground storage tank was used to store gasoline at the Ruth Jones residence, 14905 Santa Teresa Road, in a rural area outside the city limits of Morgan Hill, south Santa Clara County (see Location Map, Figure 1). In March 1997, water sampling of the shallow domestic

water well which supplies the Jones house detected gasoline hydrocarbons, and initiated the search for gasoline leaks from this aboveground tank, and from an old underground tank at the site (Weber, Hayes and Associates, 4/9/97). The aboveground gasoline tank has been emptied and is no longer in service. Soil sampling was conducted directly beneath and beside the former AST location. Excavation and soil sampling locations are shown on Figure 2.

AST investigation operations were conducted on May 11, 1997. Earthwork was conducted by an excavation contractor certified to work with hazardous materials (The Don Chapin Company, License #406512).

A total of two test pits were excavated to look for surficial soil contamination from the AST. In the second test pit (T2), an area of soil with hydrocarbon odor was encountered at the surface. The test pit was extended down to shallow groundwater at a depth of 12 feet.

A series of 6 soil samples (T2A-F) were collected from trench T2 at increasing depths, from 2 feet to 9 feet. Soils were screened for organic vapors with an Hnu System photoionization Organic Vapor Analyzer. At 8.5 feet a gravelly sand was encountered. Strong organic vapors were present, and a hydrocarbon sheen was present on gravel surfaces. At approximately 11.5 feet deep, groundwater was encountered. A water sample (T2 water) was collected with a disposable bailer. A detailed geologic description of the earth materials encountered was prepared (see Figure 3). Silty sands from the surface to 8 feet deep are underlain by highly permeable gravelly sand and cobbles to a depth of at least 12 feet.

Once groundwater was reached, the excavation was expanded on all sides to remove the source of hydrocarbon contamination. The OVA was used to field screen soil samples to determine if further removal was needed. Approximately 85 cubic yards of soil were removed, from an excavation approximately 15 feet by 12 feet, by 12-13 feet deep (see Figure 2).

After overexcavation to remove contaminated soil, sidewall samples were collected from all four sides of the excavation. Sidewall samples were collected from a depth of approximately 11 feet, immediately above groundwater.

SOIL AND WATER SAMPLE RESULTS

Soil samples were collected in accordance with the local Regional Water Quality Control Board guidelines. Selected analyses included Total Petroleum Hydrocarbons as gasoline (TPH-gas) and the volatile organic constituent compounds of gasoline including methyl-tert-butyl ether (MTBE), benzene, toluene, ethylbenzene, and xylenes (M-BTEX). Soil sampling locations and the exploratory test pits are presented in Figure 2 and the certified analytical results are presented in

the Appendix A.

Soil samples from within the test pit showed elevated concentrations of gasoline hydrocarbons at 5 feet and 9 feet deep (samples T2C and T2F). Sidewall samples from the perimeter of the enlarged excavation showed only minor or non detectable concentrations (see Table 1). These sidewall samples indicate that most soil contamination has been removed. The gasoline additive MTBE was detected at low concentrations in two soil samples (SWN and SWE), at concentrations of 4.8 and 0.6 ug/g (ppm).

The groundwater sample from the excavation (T2 Water) contained high dissolved concentrations of gasoline hydrocarbons. Benzene and MTBE were not detected in water from the excavation, but lab detection levels were greatly elevated by the high gasoline concentrations (590,000 ug/L TPH-gas).

CONCLUSIONS

Soil excavation beneath the former AST location discovered and excavated an area of approximately 85 cubic yards of soil contaminated with gasoline hydrocarbons. Based on sampling results, most of the soil contamination has been excavated. Groundwater occurs at a depth of approximately 12 feet, in a highly permeable gravel layer. High concentrations of dissolved gasoline are present in groundwater directly below the spill location. The extent of gasoline migration has not been investigated. MTBE is detected at low concentrations in soil samples.

RECOMMENDATIONS

We recommend a complete delineation of the extent of groundwater impact from the AST spill. A workplan for site investigation, soil stockpile aeration treatment, and preparation of a Corrective Action Plan should be prepared for the Santa Clara Valley Water District (SCVWD).

A copy of this technical report should be forwarded to the Santa Clara County Health Department Hazardous Materials Compliance Division, 2220 Moorpark Avenue, San Jose, CA 95159-8070 (to the attention of Mr. George Carson). A second copy should be submitted to the Santa Clara Valley Water District, 5750 Almaden Expressway, San Jose, CA 95118, (to the attention of Ms. Cris Tulloch).

LIMITATIONS

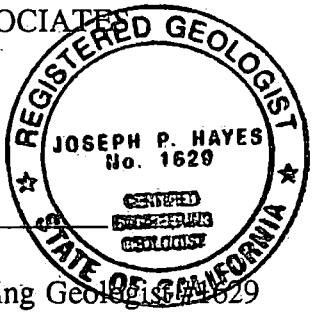
Our service consists of professional opinions and recommendations made in accordance with generally accepted geologic principles and practices. This warranty is in lieu of all others, either

expressed or implied. The analysis and conclusions in this report are based on sampling and testing which are necessarily limited. Additional data from future work may lead to modification of the opinions expressed herein.

Thank you for this opportunity to be of service. Should you have any questions or comments regarding this project, please contact us at our offices.

Respectfully submitted,

WEBER, HAYES AND ASSOCIATES
A California Corporation



By: _____
Joseph Hayes
Certified Engineering Geologist #1629
Certified Hydrogeologist #373

attachments: Table 1 : Aboveground Tank Sampling Results
Figure 1: Location map
Figure 2: Site Map
Figure 3: Aboveground tank excavation; Cross-Section and Log

-

Underground Storage Tank (AST) Investigation Report (June 1997)

Weber, Hayes & Associates
Engineering Geology and Hydrogeology
120 Westgate Dr., Watsonville, CA 95076
408) 722-3580 (408) 662-3100
Fax: (408) 722-1159

June 19, 1997

UNDERGROUND STORAGE TANK CLOSURE REPORT

Ruth Jones Residence
14905 Santa Teresa Road, Morgan Hill, CA

PURPOSE AND SCOPE

This letter report presents documentation of field operations and laboratory results for the closure of a 1,000-gallon underground storage tank (UST) at the Ruth Jones residence (see Location Map, Figure 1). Weber, Hayes and Associates was hired to oversee the UST removal operations, and collect required tank closure samples. The completed scope of work included:

- Obtaining an *Underground Storage Tank Closure Permit* from the Santa Clara County Health Department (SCCHD).
- Excavating, inerting, removing, and disposing of one 1,000 gallon gasoline tank, (no dispenser or piping present).
- Documenting the condition of the UST upon its removal and obtaining soil and water samples for laboratory analysis, as per State and Local guidelines.
- Presenting the analytical results, chain of custody, and site map in this summary report.

All field operations conformed with guidelines established by the California Water Resources Control Board in their *Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure* (1989) and Santa Clara Valley Water District (SCVWD) guidelines for tank investigations.

SITE DESCRIPTION

An inactive underground storage tank was located and removed from 14905 Santa Teresa Road, in a rural area outside the city limits of Morgan Hill, south Santa Clara County (see Location Map, Figure 1). In March 1997, water sampling of the shallow domestic water well which supplies the Jones house detected gasoline hydrocarbons, and initiated the search for and closure of this UST (Weber, Hayes and Associates, 4/9/97). The tank was located with a backhoe by digging in the location where Mrs. Jones and her daughter, Mrs. Cheri Scales remembered a

former private gasoline tank. The subject site is a private residence and orchard. The UST reportedly stored gasoline for fueling of the Jones family vehicles during the 1970's. The tank has been abandoned (unused) for approximately 8-10 years (Cheri Scales, personal communication). The abandoned UST was located along the driveway which leads to the ranch house where Mrs. Jones, an elderly widow, resides (see Site Map, Figure 2).

UNDERGROUND STORAGE TANK REMOVAL

UST removal operations were conducted on May 29, 1997. Earthwork was conducted by an excavation contractor certified to work with hazardous materials (The Don Chapin Company, License #406512). The 1000 gallon UST was exposed for purging and inerting, and all tank attachments were removed and capped, except those necessary to purge the tank. After checking that no product was in the tank, it was inerted by adding approximately 30 pounds of dry ice. Prior to removal, the tank atmosphere was monitored for combustible vapors and oxygen deficiency.

The UST was not removed until the flammable vapor concentration was less than 1.0% of the Lower Explosive Limit (LEL) and the oxygen level was less than 5%. Soil was field screened using a Hnu Photoionization Detector (PID) while the tank removal contractor excavated around the perimeter of the tank. No soil gas vapors were detected.

Upon approval from the Santa Clara County Department of Health representative (Mr. George Carson, Hazardous Materials Specialist) the tank was removed from the excavation and carefully inspected on the ground surface. The inspection revealed a number of small areas of deep pitting, but no visible holes in the tank wall. After visual inspection, the tank was lifted onto a transport truck certified to haul the tank to an appropriate disposal facility. The tank is being held at the Don Chapin Company's yard prior to transport to a certified disposal facility (Ericson, Inc. of Richmond, California, State transporters ID #402892).

After the tank was removed from the ground, native soil was collected from 1 to 2 feet beneath both ends of the base of the UST using the excavator bucket. relatively undisturbed soil samples (samples S1, S2) were collected in clean brass liners using a mallet. Immediately prior to sampling the native soils, approximately 2-4 inches of soil was rapidly scraped away from each soil sample location (backhoe bucket) to protect against the surficial release of volatile contaminants. A hand held sampling hammer/mallet was used to drive a clean two-inch diameter by three-inch long brass sleeve completely into native soils. The liner was then extracted from the native soils and the sample was immediately sealed in its grass liner with Teflon tape, non-reactive caps and airtight tape. Soil samples were immediately placed in a cooled, insulated container under appropriate Chain of Custody procedures and transported with proper chain-of- custody signatures and full

documentation to An/En, Inc. of Monterey, a State of California Department of Health Services certified laboratory.

After tank removal, a small pool of water was present beneath the UST, collected in the invert (lowest point) of the former tank excavation. As per Santa Clara County guidelines, a groundwater sample is required when water is present in the tank excavation.

As the excavation was deepened with the backhoe to allow collection of a groundwater sample, soil discoloration and hydrocarbon odor became evident beneath the eastern end of the tank (beneath sample S-2, see Site Map). Additional soil samples S-3 and S-4 were taken at depths of 12 feet and 15 feet, respectively. A saturated gravel layer with strong hydrocarbon odor was encountered at a depth of approximately 13 feet. Groundwater in the excavation stabilized at approximately 14 feet deep. A groundwater sample was collected with a disposable plastic bailer from this deepened portion of the tank excavation (UST Water sample). A groundwater sample also was collected with a disposable plastic bailer from the Jones domestic water well, located approximately 80 feet northeast of the former UST (see Figure 2). Gasoline has previously been detected in this domestic well (Weber, Hayes and Associates 4/9/97).

ADDITIONAL SOIL EXCAVATION AND TEST PITS

Based on the evident hydrocarbon contamination beneath the underground tank, additional excavation was conducted in an attempt to remove contaminated soil. The excavation was enlarged on three sides (to the north, south and east, see Figure 2). A soil sample was collected from the southern sidewall of the excavation (SouthSW sample). Field screening with an Hnu Systems Organic Vapor Analyzer (OVA) showed high concentrations of volatile hydrocarbons in the excavation sidewalls. Because enlarging the tank excavation was not reaching clean soils, we decided to dig a series of exploratory test pits around the perimeter of the tank excavation to investigate the extent of contamination. Approximately 30-45 yards of contaminated soil were excavated from beneath the former UST. A composite sample was collected from the stockpile.

A total of four test pits were excavated to investigate the extent of soil and groundwater contamination. Groundwater flow and hydrocarbon transport direction in the area are believed to be to the east. Soil samples were collected from the base of each test pit for field screening for organic vapors, and for laboratory analysis. The location of exploratory test pits are shown on Figure 2.

East: the first test pit (East TP) was located 15 feet laterally from the eastern end of the tank excavation. Soil in the trench had no staining or odor until a depth of 12 feet deep, when

strong odor and discoloration were encountered in a sand layer. A soil sample (East TP) was collected from the base of the test pit.

The second eastern test pit (East2TP) was located within 10 feet of the eastern property boundary, approximately 100 feet east of the tank excavation. This test pit was located to determine if hydrocarbon migration had reached the property boundary in the estimated downgradient direction. Groundwater was encountered at 12-13 feet in a sandy gravel layer, with no odor or detectable organic vapors. A soil sample (East2TP) was collected from a depth of 13 feet in saturated sediments. This test pit indicated that hydrocarbons do not extend to the property boundary.

North: a test pit located 35 feet north of the tank excavation had no soil odor or discoloration until a depth of 12 feet, when strong odor and discoloration was present in a sandy gravel layer. A soil sample (North TP) was collected from the base of the test pit.

South: a test pit located 52 feet south of the tank excavation had no soil odor or discoloration. A saturated sandy gravel layer was encountered at a depth of 13 feet, but no contamination was evident. A soil sample (South TP) was collected from the base of the test pit.

SOIL SAMPLE RESULTS

Soil samples were collected in accordance with the local Regional Water Quality Control Board guidelines and as directed by the field inspector. Selected analyses included Total Petroleum Hydrocarbons as gasoline (TPH-gas) and the volatile organic constituent compounds of gasoline including methyl-tert-butyl ether (MTBE), benzene, toluene, ethylbenzene, and xylenes (M-BTEX). Two soil samples from immediately beneath the tank were also analyzed for Organic Lead, as per SCCHD regulations. No lead was detected in these samples. Lab results are summarized in Table 1. Soil sampling locations for the tank removal and the exploratory test pits are presented in Figure 2 and the certified analytical results are presented in the Appendix A.

The highest hydrocarbon concentrations in soil were detected in soil sample S3, from directly beneath the tank at a depth of 12 feet. A deeper soil sample from 15 feet (S4) had almost no detectable hydrocarbons. Soil contamination in the test pits surrounding the tank excavation were dramatically lower than concentrations in sample S3 or were non detectable. No hydrocarbons were detected in soil samples from the tests pit South TP and East2 TP (see Figure 2). Low concentrations of gasoline hydrocarbons were detected in soil samples from test pits East TP and North TP. In all soil samples with hydrocarbon detection, the ratio of volatile components (BTEX) to total hydrocarbons was very low, and MTBE was not detected. This indicates an old weathered gasoline spill which has lost much of the BTEX components to soil vapor. The lack of MTBE

indicates the UST release may predate the introduction of MTBE in gasoline in the early 1980's.

WATER SAMPLING RESULTS

The groundwater sample from the tank excavation (UST Water) contained high dissolved concentrations of gasoline hydrocarbons. Benzene was detected at 910 ug/L in water from the tank excavation. No MTBE was detected in the tank water sample.

The water sample collected from the Jones Domestic well had total petroleum hydrocarbons as gasoline of 3100 ug/L, and benzene at 17 ug/L. This is the second water sample from the domestic well with detectable gasoline concentrations, and confirms groundwater impact to this drinking water well. Gasoline and benzene concentrations in this second sample were slightly higher than the previous domestic water well sample, collected March 6, 1997 (see Sampling Results, Table 1). In both water well samples, benzene exceeds the state Drinking water standard of 1 ug/L. No MTBE was detected in either sample from this well.

The domestic water well was also sampled for Title 22 General Physical, Mineral and Inorganic parameters. None of these analyses exceeded state Drinking Water standards. Results are presented in Appendix A.

Domestic Water Well Construction

The Jones household water well is greater than 30 years old (Cheri Scales, personal communication), and is constructed with 10-inch diameter steel casing. The total depth of the well is only 69.5 feet, and the depth to water is 13 feet, the same water elevation seen in test pits and the tank excavation. The screened interval and well seal elevation are not known. There is no surface seal at the well head, and an electric submersible pump is installed in the well.

Water from this well has not been used for drinking or cooking by the resident, Mrs. Jones, since March 1997. An activated charcoal filter has been installed at the house to remove gasoline hydrocarbons, and the water is used for washing only.

CONCLUSIONS

The abandoned, 1,000-gallon UST at the Jones residence has been removed under SCCHD permit. Field observations and laboratory results from soil and water collected beneath the UST indicate a gasoline release has occurred. The extent of soil contamination has been delineated by excavation of test pits around the former tank excavation. Gasoline soil contamination does not extend to the property boundary, approximately 100 feet east of the tank (test pit EAST2 TP, see

Figure 2). Groundwater contamination has impacted the domestic water well at the site, located approximately 80 feet downgradient from the tank. The extent of groundwater contamination has not be fully delineated.

Based on the age of the domestic well, the shallow depth of the well (69 feet), and the water elevation at the same elevation as shallow groundwater in excavations, the well is believed to be screened or poorly sealed to allow shallow groundwater to enter the well. Pumping at the domestic well would induce groundwater flow towards the well from the tank excavation. The sandy gravel layer encountered in all excavation below approximately 12 feet would allow rapid groundwater migration towards the well. This physical setting and the low concentrations of gasoline detected in the water well in two rounds of sampling indicate that a gasoline release from the UST has reached the domestic well.

The absence of the gasoline additive MTBE in both the domestic well water samples and in UST soil and water samples is consistent with this scenario. The lack of MTBE indicates that the source of the gasoline in the well is the underground tank, not from other gasoline storage on the property, such as the above ground tank located approximately 150 feet from the well (see Figure 2). MTBE has been detected in soil samples from a soil clean up below the above ground storage tank (see Weber, Hayes and Associates, June 18, 1997), and is a highly mobile dissolved compound. If the above ground tank had contributed to gasoline impact at the domestic well, MTBE would be expected to be one of the first gasoline components to reach the well.

RECOMMENDATIONS

We recommend a complete delineation of the extent of groundwater impact from the underground tank release, and an evaluation of an alternative domestic water supply for the residence. Once another water supply is secured, the existing water well should be properly sealed and abandoned. A workplan for site investigation, soil stockpile aeration treatment, and preparationof a Corrective Action Plan should be prepared for the Santa Clara Valley Water District (SCVWD).

The property owner should apply to the state Underground Storage Tank Fund (800-813-3863) for reimbursement of the eligible costs for the tank investigation and cleanup, and domestic well abandonment and replacement. Once a workplan for more investigation is approved by the SCVWD, the property owner should obtain multiple bids to conduct the work, as per state UST Fund guidelines.

A copy of this technical report should be forwarded to the Santa Clara County Health Department Hazardous Materials Compliance Division, 2220 Moorpark Avenue, San Jose, CA 95159-8070 (to the attention of Mr. George Carson). A second copy should be submitted to the Santa Clara Valley

Water District, 5750 Almaden Expressway, San Jose, CA 95118, (to the attention of Ms. Cris Tulloch).

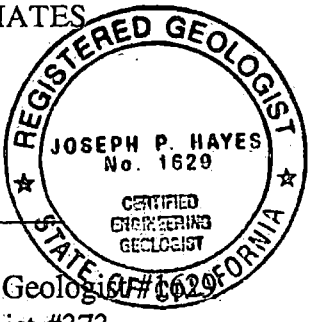
LIMITATIONS

Our service consists of professional opinions and recommendations made in accordance with generally accepted geologic principles and practices. This warranty is in lieu of all others, either expressed or implied. The analysis and conclusions in this report are based on sampling and testing which are necessarily limited. Additional data from future work may lead to modification of the opinions expressed herein.

Thank you for this opportunity to be of service. Should you have any questions or comments regarding this project, please contact us at our offices.

Respectfully submitted,

WEBER, HAYES AND ASSOCIATES
A California Corporation



By: _____
Joseph Hayes
Certified Engineering Geologist #1629
Certified Hydrogeologist #373

attachments: Table 1 : Underground Tank Sampling Results
Figure 1: Location map
Figure 2: Site Map

Table 1
Undergroundground Tank Sampling Results
Ruth Jones Residence UST

Sample	Depth (ft.)	TPH-Gas	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	LEAD
S1	10	ND	ND	ND	ND	0.08	ND	ND
S2	10	8	ND	ND	ND	0.13	ND	ND
S3	12	1,300	3.5	32	24	110	ND	na
S4	15	ND	ND	0.09	0.06	0.3	ND	na
EAST TP	13	34	ND	ND	ND	0.1	ND	na
SOUTH TP	13	ND	ND	ND	ND	ND	ND	na
NORTH TP	13	10	ND	ND	0.09	0.59	ND	na
EAST 2 TP	13	ND	ND	ND	ND	ND	ND	na
COMPOSITE (1234)	N/A	210	ND	1.3	1.6	9	ND	na
UST WATER*	13	410,000	910	13,000	8,600	42,000	ND	na
DOMESTIC WELL* (3/6/97)	13	280	2.1	1.2	1.8	41	ND	na
DOMESTIC WELL* (4/11/97	13	3,100	17	30	69	560	ND	na

All soil concentration results are measured in micrograms per gram (ug/g = parts per million [ppm])

*All water concentration results are measured in micrograms per liter (ug/L = parts per billion [ppb])

ND None Detected
na not analyzed

-

Previous Phase I & II ESA Report
(Sept-2013)

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

PHASE I/II ENVIRONMENTAL SITE ASSESSMENT
for an Agricultural Property

14905 Santa Teresa Boulevard
Morgan Hill, California

September 10, 2013
Project: 2X330

Prepared for:
Mr. Doug Blackwell
Jack R. Blackwell Inc.
PO Box 817
Campbell, CA 95009

Above: **Tree Farm within Subject Property**
Santa Clara County Assessor Parcel Number:
779-02-023

Protecting California's Groundwater Resources Since 1988.

PHASE I ESA FINDINGS SUMMARY

14905 Santa Teresa Boulevard, Morgan Hill

		Phase I ESA Results (section #)	NFA	HREC	REC	Details & Comments
Historical Review	4.1	City Telephone Directories	X			No evidence of on-site or vicinity business operations of concern were noted during our review.
	4.2	Historic Land Use Maps	X			No coverage was available.
	4.3	Aerial Photographs	X		X	Historical aerial photographs taken between 1939–2012 shows that the subject Site has remained an agricultural property for 70+ years. Surrounding land-use was historically agricultural, with increasing residential development from the 1980s onward. **The potential presence of persistent pesticide residues is considered a *Recognized Environmental Condition* (REC) for long-term agricultural properties transitioning to residential.** Note: ***Phase II soil testing addressed this REC***
	4.4	Topographic Maps	X			There is no evidence from these topographic maps of significant geophysical or hydrological changes at the Site or surrounding area that could negatively impact soil or groundwater at the Site.
Regulatory Review	5.1	Federal, State and Regional Environmental Records (source: EDR Database)	X	X		A fuel release was discovered at the subject Site during tank removal operations for a 1,000 gallon gasoline UST and 500 gallon gasoline AST. The release was investigated and remedied in the late 1990s and officially granted closure in a letter dated January 9, 2001. Confirmation sampling results completed as part of our Phase II investigation yielded either non-detectable to trace detections of petroleum hydrocarbons in soil, soil vapor and groundwater. **This is considered a *historical recognized environmental condition (HREC).*** Note: ***Phase II soil & groundwater testing addressed this HREC***
	5.2	Vapor Encroachment Conditions Screen	X			No fuel releases or land-use conditions on the subject Site or surrounding properties were found to pose the risk of vapor encroachment on the subject Site. Soil vapor samples collected in the vicinity of the former fuel release at the subject Site had some low-level detections, but were all well below regulatory thresholds for residential land-use.
	5.3	Geotracker / Envirostor Databases	X			Our review of the State of California Geotracker database did not yield any additional business operations or environmental conditions of concern for the subject Site or stemming from surrounding properties.
	5.4	Local Agency File Review	X			Our review of Santa Clara County's environmental health records database did not yield any additional business operations or environmental conditions of concern for the subject Site or stemming from surrounding properties.
Site Recon	6.1	Site Inspection	X			No indications of change in commercial operations at the subject Site since the last ESA in 2003. The tree farm and orchards are no longer maintained, and generally speaking the equipment, barn facility and external premises showed that no commercial operations have continued at the Site.
	7.1	User Questionnaire / Interviews	X			Our review of the User Questionnaire and interviews from County and State regulatory staff did not reveal any additional environmental concerns for the subject Site.

Explanation of Environmental Assessment Terminology

adapted from ASTM Standard E 1527-05

'REC' - Recognized Environmental Condition: The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

'HREC' - Historical Recognized Environmental Condition: An environmental condition which in the past would have been considered a recognized environmental condition, but which may or may not be considered a recognized environmental condition currently.

'NFA' - No Further Action, *De minimis* Condition: Conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.-

PHASE II ESA FINDINGS SUMMARY

(Soil, Soil Vapor, & Groundwater Sampling)

14905 Santa Teresa Boulevard, Morgan Hill

		Phase II ESA (Soil, Soil Vapor and Groundwater Results)	Conclusions & Recommendations
Phase II Findings	Section 8.2	**Soil Sampling Results:** Three of the composite samples analyzed for persistent organochlorine pesticides (OCPs) yielded detections of dieldrin above the residential ESL. In addition, three of the surface soil samples collected around site buildings yielded slightly elevated detections of lead (likely present due to historical lead-based paint applications).	**Dieldrin Detections**: All soil sampling results contained some limited detections of this persistent pesticide compound but the concentrations were all below the screening limits for residential health and safety concerns (i.e., CHHSL guidelines). However, some of these trace detections exceeded the leachability threshold established in the Water Board's *Environmental Screening Limit* (ESLs, see note below) In consultation with lead Water Board staff, laboratory reanalysis was completed on soil from the quadrant having the highest total dieldrin concentrations. This sample was re-analyzed to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis confirmed the site-specific leachable concentrations were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site. **Total Lead Detections**: Some elevated Total Lead concentrations were detected from 3 areas around the perimeter foundations. Some limited soil scraping will need to be completed (during, or prior to property development) to remove of a limited volume of shallow soil (the source of elevated Total Lead concentrations appears to be from lead-based paint scrapings).
		Groundwater Sampling Results: Groundwater encountered at depths ranging from 12.3 to 16.6 feet below ground surface (bgs) from four hydraulic driven probe borings. Groundwater samples analyzed for non-detect for petroleum hydrocarbons.	Groundwater test results confirmed there are no significant impacts from the historic fuel release at the site. *No further action is required.*
		Soil Vapor Sampling Results: All four soil vapor samples were either non-detectable or well below regulatory thresholds for the contaminants analyzed.	Soil vapor test results confirmed there are no vapor intrusion risks resulting from the historic fuel release at the site. *No further action is required.*

California Human Health Screening Levels for Soil (CHHSLs): The CHHSLs are health-based guideline concentrations established for 54 common Hazardous Chemicals of Concern found in in soil or soil gas. The California Environmental Protection Agency (Cal/EPA) considers detection at or below these established threshold concentrations pose insignificant risk to human health and safety. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has developed these screening limits in a guideline document *("Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater"*, Interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted based on conservative risk and leachability model inputs. The ESLs referenced here were obtained from the *Table A. Shallow Soils (<3m) where groundwater IS a current or potential Source of Drinking Water*.

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

1.0 EXECUTIVE SUMMARY

This report contains results of a *Phase I Environmental Site Assessment* (ESA) and Phase II confirmation soil & groundwater investigation, which has been conducted to review and assess potential environmental risks at a vacated agricultural property located at 14905 Santa Teresa Boulevard in Morgan Hill, California (the "Site", see Figure 1, Location Map). The Phase I research investigation was completed to identify *potential* environmental risks associated with the property and the Phase II soil and groundwater sampling program was concurrently conducted to assess potential impacts from a historical fuel release and/or historical agricultural land-use (i.e., potential residual impacts from persistent organochlorine pesticides, OCPs).

This agricultural property spans approximately 18 acres, and has been used for agricultural purposes dating back to at least 1939 (the earliest available aerial photograph). Site topography is relatively flat-lying, with elevations that range from approximately 340 to 350 feet above mean sea level (MSL). The property is bounded to the southeast by the northeasterly flowing Llagas Creek. The surrounding land-use is a combination of agricultural and residential, with increasing residential development to the north along Santa Teresa Boulevard since the 1980s (see Figure 2 – Vicinity Map). First encountered groundwater beneath the property is fairly shallow, at depths generally ranging from 10 to 15 feet below ground surface (bgs).

1.1 Summary of Phase I Research

Phase I ESAs provide limited assurances of risk, since they rely on current Site conditions (Site inspections), cooperative and candid interviews/questionnaires, and a limited database of regulatory and historical documentation. The Site inspections, interviews, and review of regulatory and historic documents are designed to identify potential environmental liabilities of concern. These potential liabilities have been defined by the *American Society for Testing and Materials (ASTM)* into the following categories: (1) ***recognized environmental conditions***, (2) ***historical recognized environmental conditions*** and (3) ***de minimis conditions*** (definitions presented on Project Findings Summary, pg. iv).

- Historical Review: **Historical aerial photographs document that the Site has remained in agricultural use since at least 1939. Persistent pesticide residues are considered a potential REC, particularly with a land use change to residential. No other *recognized environmental conditions*** were identified for the subject property or from surrounding properties from the review of historical documents, which included aerial photos, land use maps, reverse telephone directories and topographic maps.
- Regulatory Review: Our review of available agency records that document chemical storage, waste handling, and/or chemical releases indicate there are currently **no on-site or surrounding *recognized environmental conditions*** having the potential to negatively impact the subject Site.

1. Closed Fuel Release Case (LUST): Our review did note that a historical leaking underground storage tank (LUST) occurred at the site, subsequent investigation and monitoring indicated the release was minor and attenuating. The overseeing agency issued a "no further action" closure letter in 2001 following 4 years of groundwater monitoring. Currently, Phase II confirmation soil, soil vapor and groundwater sampling was conducted in the vicinity of this release which confirmed no significant impacts are present (findings are detailed in Section 1.2 below). The presence of this closed fuel release case **is considered a *historical recognized environmental condition* (HREC).**
2. Closed Upgradient / Sidegradient Fuel Release Case (LUST): Former Rist Quarry: We reviewed of the case history for a historical fuel release at 14905 Watsonville Road, which is located on adjoining property to the west of the Site perimeter (see Figure 4). A summary of the case history is presented in Appendix D. The presence of this closed fuel release **is considered a *de minimis environmental condition*.**

- Inspection/Land-Use Questionnaire: The visual inspection of the Site, the review of a *User Questionnaire* and our site interviews did not **reveal any *recognized environmental conditions*** at the subject Site.

1.2 Summary of Phase II Limited Soil and Groundwater Assessment

A *Limited Phase II Soil, Soil Vapor & Groundwater investigation* was completed in order to assess: 1) whether any remaining elevated petroleum hydrocarbons from the former underground storage tank release persist, and 2) whether residual pesticide contamination is present as a result from historical applications of agricultural chemicals within orchards and agricultural fields at the property.

The Phase II sampling program revealed the following:

- Sampling results targeting the former fuel release: No further action will be required. Groundwater, soil and soil vapor samples analyzed for petroleum hydrocarbons around the former fuel release yielded only a few trace detections of diesel and constituent volatile organic compounds (VOCs).
- Sampling results targeting lead-based paint and asbestos around Site infrastructure: Some limited soil scraping from 3 areas around the perimeter foundations will need to be completed (during, or prior to property development) to remove a limited volume of soil apparently impacted by lead-based paint scrapings. No detections of asbestos were found in the soil samples (Lead results are presented on Figure 7 and Table 3).
- Sampling results targeting transition from agricultural land use to residential land use: All soil sampling results contained some limited detections of this persistent pesticide compound but the concentrations were all below the screening limits for residential health and safety concerns (i.e., CHHSL guidelines, results of shallow soil testing is shown on Figure 5 and Table 1). However, some of these trace detections exceeded the leachability threshold established in the Water Board's *Environmental Screening Limits* (ie., ESL guidelines). In consultation with lead

Water Board staff, laboratory reanalysis was completed on soil collected from the Site quadrant having the highest total dieldrin concentrations. This soil sample was re-analyzed to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis confirmed the site-specific leachable concentrations were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site.

1.3 Executive Summary: Conclusions and Recommendations

We have performed a *Phase I Environmental Site Assessment* in accordance with the scope and limitations of *ASTM Practice E 1527* for a property located at 14905 Santa Teresa Boulevard in Morgan Hill. There were no exceptions to, or deletions from, this practice (i.e. data gaps), as described in Section 8.0 of this report.

This assessment did not reveal evidence of ***recognized environmental conditions*** at the subject property. However, to provide conservative assurances for land use transition from agricultural to residential, a Phase II sampling program was conducted.

Based on these results, we conclude there are no environmental impediments for residential land use.

This concludes the *Executive Summary*.

2.0 PURPOSE AND SCOPE

This report contains results of a *Phase I Environmental Site Assessment* (ESA) that has been conducted to review environmental liabilities resulting from historic or existing environmental risks for the subject properties. Completed work tasks conformed to the recommended guidelines established by the American Society for Testing and Materials (ASTM). *Limitations and Exceptions of Assessment* are listed at the end of this report.

The purpose of this ESA is to provide a professional opinion regarding *recognized environmental conditions* at the Site, including potential impacts from known environmental problems in the surrounding area. The term "*recognized environmental conditions*", is defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property" (ASTM Standard E 1527).

2.1 Defined Scope and Methodology

The scope of services completed for this Phase I/II ESA, included the following tasks:

- We reviewed historical maps, and aerial photographs, available geologic, topographic and groundwater data of the Site and vicinity (Section 4 of this report).

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- We completed a visual inspection of the Site, to check for indicators that might suggest a potential source of contamination such as current hazardous materials storage or use, unusually stained ground surfaces (soils, slabs), stressed vegetation, sumps/drains/tanks, and discarded hazardous material containers (Section 6 of this report). A copy of our Site Inspection Checklist, which includes Site photos, is included in Appendix A.
- We reviewed a Property Land-Use Questionnaire completed by a person knowledgeable of current/historical land-uses (Section 7 of this report).
- We reviewed available records of hazardous material storage and releases documented in databases or file reviews at State and Local regulatory agencies such as the California State GeoTracker® and the Santa Cruz County Department of Environmental Health for the subject Site and sites within a quarter mile radius of the subject Site (see Section 5 of this report and Appendix C for a copy of pertinent documents).
- We contracted with EDR, an information research firm specializing in environmental data collection, to conduct a regulatory list search of sites with underground fuel storage tanks (UST's), contaminated sites, hazardous waste generation or treatment-storage-and disposal facilities, and landfills located within ASTM survey radius. We evaluated the locations of all identified sites relative to the Site (see Appendix C for a copy of EDR's radius report).
- Based on recognized environmental conditions identified as part of the Phase I ESA research, we completed a Phase II soil and groundwater sampling and testing program to assess potential environmental liability associated with the historical land uses and nearby release sites. The details are presented in Section 8 of this report.
- We evaluated the collected information and prepared this summary report.

3.0 SITE DESCRIPTION

3.1 Location Setting

The subject Site is a vacated, approximately 18-acre agricultural property, containing several structures including a dilapidated barn, one house and an adjoining garage (Figure 3). An older residential dwelling was reportedly demolished in the 1990s. The remainder of the property is sporadically and in places densely

***Above**: Domestic water supply well installed at the Site in 1998.*

vegetated, with patches of Christmas trees and orchards previously managed at the Site (see photos, Appendix A).

The one-story, wooden barn structure was built prior to 1917 (visible in topographic maps) apparently in conjunction with agricultural activities at the site. The barn is currently unused, and is in disrepair with refuse throughout. There is no evidence of current chemical storage within the barn or its vicinity. There are some tools and agricultural equipment, apparent remnants of the Christmas tree farm operations conducted on the Site by previous owners.

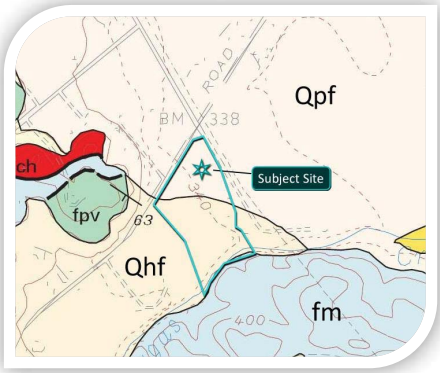
Aerial photographs indicate the residence and associated garage were built sometime in the early 1960s. The house and garage are in good condition and are well maintained. There is no evidence of significant hazardous materials or petroleum products storage associated with these structures, aside from small quantity household fuel and chemical storage for automotive and property maintenance.

Site topography is generally flat, ranging from 340 to 350 feet above mean sea level (MSL). In the northwest portion of the property, a large man-made inclined mound is present.

The surrounding land-use is a combination of residential and agricultural, with increasing residential development to the east and north of the subject Site since the 1980s (*see Figure 2 – Vicinity Map*).

3.2 Local Hydrogeologic Setting

The subject Site lies in the southern portion of Santa Clara Valley at an elevation of approximately 340 feet above Mean Sea Level (Figure 1), on the eastern flank of the Santa Cruz Mountains. The geologic structure of the area is controlled by northwest/southeast trending faults with mountains and valleys with the same orientation. The Santa Clara Valley is bounded by the Santa Cruz Mountains to the southwest and the Diablo Mountain Range to the northeast. The general vicinity is underlain by alluvial fan deposits over inter-bedded shale and sandstone bedrock. Unconsolidated surface soils are typically coarse grained alluvial fan sediments which include fine to coarse grained gravel and sand, with some silt and clay present. These alluvial fan deposits are inter-bedded with finer gravel, sand, silt, and clay stream deposits as they progress towards the center of the valley.



Regional Geologic Map
Qhf = alluvial fan deposits, *Qpf* = older, dissected alluvial deposits, *fm* = Melange of the Central belt

Groundwater in the vicinity of the subject site is unconfined, and flows generally to the east to northeast towards Llagas Creek. The depth to groundwater in the vicinity of the Site has been documented to be approximately 10-15 feet below ground surface.

4.0 HISTORICAL REVIEW

Historic maps, telephone directories, and aerial photographs can be a valuable resource for determining obvious past uses of the property. These records can provide evidence of notable land use changes to the property and potential clues of hazardous material storage (copies of historic maps and aerials are included in Appendix B). Land use observations of these historical records are summarized below.

4.1 City Telephone Directories

Historical research of reverse City Telephone Directories for nearby and adjacent properties generally indicate that most of the occupants of adjacent and nearby properties were residential (or residential associated with agricultural land-use).

On-Site Land Uses: The City Telephone Directory lists a private residency and an agricultural Christmas tree farm operation as the occupants of the subject Site between 1975-2011. The following table lists the historical residents for *14905 Santa Teresa Blvd.*

Target Property Occupants/Businesses		
Site Address	**Year**	**Occupants**
14905 Santa Teresa Blvd	*2011*	*No Return*
	2000	Residential
	1996	Residential
	1991	Llagas Creek Christmas Trees, Residential
	1986	Llagas Creek Christmas Trees , Residential
	1980	Llagas Creek Christmas Trees , Residential
	1975	Llagas Creek Christmas Trees , Residential

Vicinity Land Uses: The following table summarizes the historical listings for adjacent and surrounding properties. *There do not appear to be any potential sites of concern that are both hydrogeologically upgradient and close to the subject.*

Neighboring Property Occupants/Businesses		
Site Address	**Year**	**Occupants**
14830 Branston Ct (adjacent parcel to the south, *upgradient*)	2011 2005 2000	Residential Residential Residential

Neighboring Property Occupants/Businesses		
Site Address	**Year**	**Occupants**
14840 Branston Ct (adjacent parcel to the southwest, *upgradient*)	2011 2005 1996	Residential Residential Residential
14730 Secretariat Way (adjoining parcel to the east, *sidegradient*)	2011	Residential
14915 Santa Teresa Blvd (nearby parcel, 800 feet east, *sidegradient*)	*2000* *1996* *1991* 1986 *1980* 1975	*No Return* *No Return* *No Return* Residential *No Return* Knope Bros Residential
14815 Santa Teresa Blvd (nearby parcel, 1,000 feet east, *sidegradient*)	*1991* 1986	*No Return* Residential

Our review of the City Telephone Directories did not identify long-term land-uses that would suggest areas of concern for the subject Site or from properties in the Site vicinity.

4.2 Sanborn Fire Insurance Maps

Sanborn Fire Insurance Maps are typically associated with urban land-use and can provide detailed, historical land use information where the insurance company provided coverage. The Sanborn Map database was reviewed and no coverage was available for this rural area (*see Sanborn Coverage Report, Appendix B*).

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4.3 Aerial Photographs

Twelve (12) aerial photographs depicting the subject Site and the vicinity were available from 1939 through 2012. Copies of the historical aerials are included in Appendix B. The following table summarizes our observations:

Year	On-Site Photo Observations	Off-Site Photo Observations
1939	The Subject site ("Site") appears to be in agricultural use with orchard rows covering the majority of the property. The property appears to be just a portion of a much larger agricultural property. A group of structures near the eastern corner of the property appear to be domestic residences or agricultural structures. A creek runs along the southeast border of the property.	The surrounding area appears to be agricultural or undeveloped land (possibly for grazing). Orchard rows comprise the majority of the properties surrounding the Site. Santa Teresa Blvd bisects the surrounding area in a southwest-northeast direction.
1956	The Site generally appears as it did in the previous photo. A portion of the property at the southern tip appears to be growing a different type of tree than the rest of the property, likely the beginning of the Christmas tree farming operation.	The surrounding area generally appears as it did in the previous photo. What appear to be large agricultural structures can be seen to the southwest of the subject site.
1968	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo. Additional agricultural structures can be seen on various properties to the north of the subject site.
1974	The orchard rows in the northern portion of the site appear to have been removed.	The surrounding area generally appears as it did in the previous photo. Additional agricultural structures can be seen on various properties to the north of the subject site.
1982	The Site generally appears as it did in the previous photo. Poor photo quality does not allow for detailed observations of the site.	Large sections of former agricultural land have been developed for residential use to the north and west of the subject site. Poor photo quality does not allow for detailed observations of the surrounding area.
1993	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.
1999	The Site generally appears as it did in the previous photo.	Residential development continues to spread from the northeast towards the subject site.

Year	On-Site Photo Observations	Off-Site Photo Observations
2005	The Site generally appears as it did in the previous photo	A road ending in a cul de sac is now seen at the eastern corner of the property. Property lines appear to have been adjusted to account for the roadway.
2006	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.
2009	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo. Residential development continues to spread.
2010	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.
2012	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.

Historical aerial photographs taken between 1939–2012 show that the subject Site has remained an agricultural property. Surrounding land-use was historically agricultural, with increasing residential development from the 1980s onward.

4.4 Topographic Maps

Historical topographic maps, which include the subject property and surrounding sites, were obtained and reviewed (see Appendix B). The topographic maps depict this area of Morgan Hill from 1917 through 1996. There is no evidence from these topographic maps of significant geophysical or hydrological changes at the Site or surrounding area that could negatively impact soil or groundwater at the Site.

4.5 Summary of Historical Review

In summary, no obvious environmental conditions of concern were observed during our historical review for the subject Site or from properties in the Site vicinity. An integrated summary of the accumulated Phase I ESA findings is presented below, in *Section 9.0 – Findings & Opinions*.

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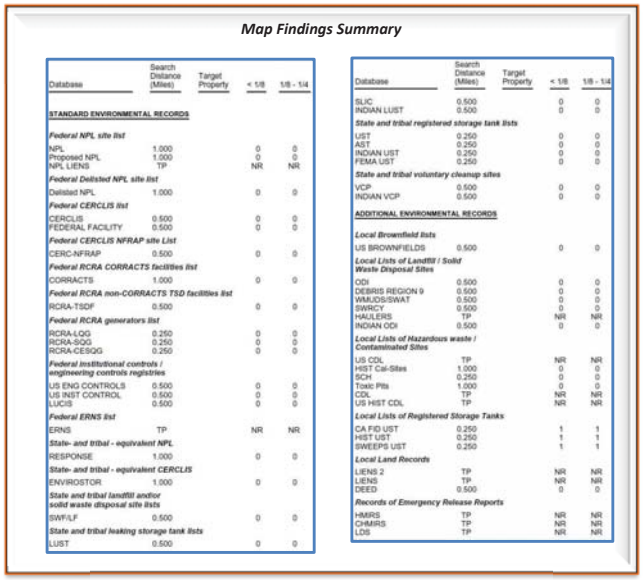

Map Findings Summary

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4
STANDARD ENVIRONMENTAL RECORDS				
Federal NPL site list				
NPL	1.000		0	0
Proposed NPL	1.000		0	0
NPL LIENS	TP		NR	NR
Federal Delisted NPL site list				
Delisted NPL	1.000		0	0
Federal CERCLIS list				
CERCLIS	0.500		0	0
FEDERAL FACILITY	0.500		0	0
Federal CERCLIS NFRAP site List				
CERC-NFRAP	0.500		0	0
Federal RCRA CORRACTS facilities list				
CORRACTS	1.000		0	0
Federal RCRA non-CORRACTS TSD facilities list				
RCRA-TSDF	0.500		0	0
Federal RCRA generators list				
RCRA-LQG	0.250		0	0
RCRA-SQG	0.250		0	0
RCRA-CESQG	0.250		0	0
Federal institutional controls / engineering controls registries				
US ENG CONTROLS	0.500		0	0
US INST CONTROL	0.500		0	0
LUCIS	0.500		0	0
Federal ERNS list				
ERNS	TP		NR	NR
State- and tribal - equivalent NPL				
RESPONSE	1.000		0	0
State- and tribal - equivalent CERCLIS				
ENVIROSTOR	1.000		0	0
State and tribal landfill and/or solid waste disposal site lists				
SWF/LF	0.500		0	0
State and tribal leaking storage tank lists				
LUST	0.500		0	0

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4
SLIC	0.500		0	0
INDIAN LUST	0.500		0	0
State and tribal registered storage tank lists				
UST	0.250		0	0
AST	0.250		0	0
INDIAN UST	0.250		0	0
FEMA UST	0.250		0	0
State and tribal voluntary cleanup sites				
VCP	0.500		0	0
INDIAN VCP	0.500		0	0
ADDITIONAL ENVIRONMENTAL RECORDS				
Local Brownfield lists				
US BROWNFIELDS	0.500		0	0
Local Lists of Landfill / Solid Waste Disposal Sites				
ODI	0.500		0	0
DEBRIS REGION 9	0.500		0	0
WMUDS/SWAT	0.500		0	0
SWRCY	0.500		0	0
HAULERS	TP		NR	NR
INDIAN ODI	0.500		0	0
Local Lists of Hazardous waste / Contaminated Sites				
US CDL	TP		NR	NR
HIST Cal-Sites	1.000		0	0
SCH	0.250		0	0
Toxic Pits	1.000		0	0
CDL	TP		NR	NR
US HIST CDL	TP		NR	NR
Local Lists of Registered Storage Tanks				
CA FID UST	0.250		1	1
HIST UST	0.250		1	1
SWEEPS UST	0.250		1	1
Local Land Records				
LIENS 2	TP		NR	NR
LIENS	TP		NR	NR
DEED	0.500		0	0
Records of Emergency Release Reports				
HMIRS	TP		NR	NR
CHMIRS	TP		NR	NR
LDS	TP		NR	NR

5.0 REGULATORY AGENCY INFORMATION

5.1 Database Search of Federal and State Environmental Records

Records of hazardous material storage and releases are required to be kept by regulatory agencies overseeing these environmental conditions. An information research firm specializing in environmental data collection, EDR, prepared a *Radius Map Report* for the Site, dated June 28, 2013 (included in Appendix C). *The Radius Map Report* identifies sites listed in the selected regulatory databases, presents location maps and details on identified sites, provides a description of the Federal and State agency data reviewed, and limitations to the search. The search specifically documents sites having registered underground fuel storage tanks (UST's), hazardous waste generation, hazardous waste treatment-storage-disposal, and subsurface contamination. Search distances are per ASTM's E1527 standard (see Appendix C for a list of all sites and full descriptions of all regulatory databases). The database search identified the following information for the target property and surrounding sites.

Subject property: The subject property ("Target property") ***was identified*** in several regulatory databases as having a record of a fuel release (LUST, HIST CORTESE), a record of formerly maintaining an UST (HIST UST) and as a one-time generator of hazardous waste (HAZNET). No other historical regulatory records were found for the subject Site. Further details are provided in the table below:

Facility Name	Source	Comments
14905 Santa Teresa Boulevard Former Jones Christmas Tree Farm	LUST, CORTESE HAZNET, HIST UST	**CLOSED FUEL RELEASE CASE** **Former Jones Christmas Tree Farm** operated as a Christmas tree farm at the subject Site that managed a 1,000-gasoline UST and a 500-gallon gasoline AST. Both tanks were removed from the property in 1997, after which a release investigation and cleanup was conducted.

Summary of Investigations: In 1997 a subsurface sampling investigation was performed in the vicinity of an AST on the property. This AST had been emptied and was no longer in service at the time of this investigation. Two test pits were excavated for this investigation to look for surficial soil contamination from the operation of the former AST. An area of soil with hydrocarbon odor was encountered in the second test pit excavated for this investigation. This test pit was extended down to shallow groundwater and all obviously contaminated soils were removed (approximately 85 yd^3).

Then, in May 1997 a 1,000-gallon UST was excavated and removed from the Site. Discolored soil and strong hydrocarbon odors were observed beneath the former UST. The UST excavation was enlarged in an attempt to remove the contaminated soils. Approximately 40 yd^3 of contaminated soil was removed from the UST excavation. No additional soil contamination above the water table was identified. Hydrocarbon discoloration was visible below 12 feet, at the groundwater interface.

Gasoline hydrocarbons were detected in the groundwater sample collected from the old water supply well, with concentrations of benzene exceeding the state Drinking Water Standards (see well location depicted on Site Map – Figure 3). The old water supply well was located approximately 80 feet down-gradient from the UST on the property. This well was sealed and abandoned under SCVWD permit, and replaced with a deeper production well in 1998.

The only significant area of contamination identified in this subsurface investigation was the groundwater in the immediate vicinity of the former UST, with no contaminants detected in the groundwater sample collected from the down-gradient well MW-1. As part of this investigation, the domestic water supply system was also sampled. Water samples were collected from the Kitchen Sink at the residence, a Yard faucet, and from the new supply well. The results of water sample analysis revealed residual levels of contamination in the piping leading from the new supply well to the residence.

Quarterly groundwater monitoring at the site was discontinued following SCVWD closure of the fuel leak case at the site. SCVWD closure of the fuel leak investigation at the site was officially granted in a letter dated January 9, 2001. The four groundwater monitoring wells at the site were properly destroyed with SCVWD oversight in March of 2001. Proper destruction of the site groundwater monitoring wells was the final task required by the SCVWD for complete closure of the fuel leak investigation.

Surrounding Sites: Our review of the EDR Radius Report revealed the following for properties within the Site vicinity:

- Chemical/Fuel Release Sites: The records search identified a total of **one (1)** site located within a ¼-mile radius of the Site as having a record of a release of contamination to soil or groundwater [i.e.

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Leaking Underground Storage Tanks (LUST), Cortese, Spills Leaks Investigations and Cleanup (SLIC), Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) LUST and Voluntary Cleanup Priority Listing (VCP)]. See *Figure 4 – Surrounding Site Regulatory Review* for a visual representation of current and historical surrounding environmental concerns, and *Appendix C – EDR Radius Report*.

- Hydrogeologically Upgradient Fuel Release Sites: We reviewed the documented surrounding fuel release sites and **identified the following one (1) site** to the north (hydrogeologically upgradient) that is also within a ⅛-mile from the subject Site. Upgradient release sites are the most likely nearby sources for subsurface migration of contaminants in groundwater onto the subject Site. The table below provides details on the release case histories and regulatory actions for each site:

Facility Name	Location	Source	Comments
14905 Watsonville Road Former Rist Quarry	550 feet West	LUST	**CLOSED FUEL RELEASE CASE** **Former JR Norton Co.** operated at this adjoining, upgradient property. A 4,000-gallon gasoline and 1,000-gallon diesel UST were removed from the property in 1989, and indications of a release were observed. A fuel release investigation of the aged diesel release; located approximately 550 feet upgradient from the Site boundary to the west was completed. One monitoring well was installed, which did not provide sufficient location/depth data to calculate groundwater flow direction. The release was gauged to be limited and the overseeing agency staff granted site closure.

- Underground Storage Tanks (USTs): The database search of generally historical regulatory records **identified one (1) site** located within a ¼-mile radius having a current or historical record of permitted UST's (UST, HIST UST, SWEEPS UST, Cal FID UST and/or Indian UST). *Note: these databases do not accurately indicate whether any active tank(s) are operational at these sites. Duplicate entries are also omitted from this figure.*
- Hazardous Waste: The records search **did not identify any sites** located within a ¼-mile radius as having records showing generation and proper disposal hazardous waste, typically a waste oil or oily waste (RCRA-SQG, RCRA-LQG, RCRA-NonGen, Notify 65, EDR Proprietary Records).
- Dry Cleaners: The records **did not identify any sites** operating as dry cleaners within ¼-mile radius, (Dry Cleaners).
- Orphan Sites: The EDR report lists **twenty (20)** unmapped sites ("***orphans***") obtained from the list of databases, for which EDR was not able to determine an exact location. However, upon further research, none of these sites appear to be located in the immediate vicinity of the Site and/or do not have a chemical release associated with them.

- Combined Regulatory Review Map**:** A comprehensive radius map documenting significant nearby releases, hazardous materials and waste management, UST/AST storage and other significant environmental features is presented in *Figure 4 – Surrounding Site Regulatory Review*.

5.2 Vapor Encroachment Conditions (VEC) Review

In accordance with updated standards for assessing vapor encroachment (ASTM E2600-10), we evaluated the Site and its vicinity for vapor encroachment conditions, or conditions that indicate that sources and pathways for harmful volatized chemicals to enter current or future on-site buildings are present at the Site and/or Site vicinity. **We did not identify any sites** within a 1/10-mile radius around the subject Site as having the potential to pose the risk of vapor intrusion on the subject Site.

5.3 Geotracker / EnviroStor File Review

Records of hazardous materials storage and releases can also be found in state regulatory agency databases, such as the California State Water Resources Control Board Geotracker® database and Department of Toxic Substances Control EnviroStor database. A review was conducted for records on the subject Site, neighboring sites and sites revealed in the federal and state environmental database search from Section 5.1.

- Our review of the California State Geotracker database, conducted on July 3, 2013, did not identify any additional site within a ¼-mile radius of the subject Site as having a record of a release of contamination to soil or groundwater (see Figure 4 – 'Surrounding Site Regulatory Review').

5.4 *Santa Clara County Department of Environmental Health* File Review

We reviewed *Santa Clara County Department of Environmental Health Department's* public records database to retrieve any documentation of releases or hazardous materials storage pertaining to the subject Site not already identified by other regulatory databases.

5.5 Summary of Regulatory Review

In summary, our review of regulatory databases and reasonably ascertainable documents indicates that there was a single historical fuel release at the subject Site that was closed by the overseeing regulatory agencies in 2001 following assessment drilling & monitoring. We found documentation of an off-site release within a ¼-mile radius of the subject Site at 14905 Watsonville Road (Former Rist Quarry). This adjoining property diesel release received case closure by the overseeing agency following subsurface investigation.

A comprehensive radius map documenting significant nearby releases, hazardous materials and waste management, UST/AST storage and other significant environmental features is presented as *Figure 4 – Surrounding Site Review*. An integrated summary and assessment of the accumulated Phase I ESA findings is presented in *Section 9.0 – Findings & Opinions*.

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6.0 SITE INSPECTION

6.1 Overview

A Site inspection was conducted on July 9, 2013, to note potential sources of contamination associated with on-site activities. A copy of the completed *Site Inspection Checklist*, which contains detailed documentation of the Site survey including a photographic record of the inspection, is presented in Appendix A.

Site Visit Observations	
Subject Property Observations:	
Current Use of Property	The Site is an approximately 18-acre agricultural property, with a dilapidated barn, one house and an adjoining garage present. The remainder of the Site contains sporadic and at times dense vegetation, with patches of the former Christmas trees and orchards. Site topography is generally flat, however a large, inclined man-made hill is present in the northwestern portion of the property. The one-story, wooden barn structure was built prior to 1917 (present in topographic maps) in conjunction with agricultural activities at the site. The barn is currently unused, and is in disrepair with refuse throughout. There is no evidence of current chemical storage within the barn area. There are some tools and agricultural equipment remnants of the Christmas tree farm operations which were conducted on the Site by previous owners. The residence and associated garage were built sometime in the early 1960s (aerial photographs). The house and garage are in good condition and are well maintained. There is no evidence of chemical storage associated with these structures, aside from basic household fuel and chemical storage for automotive and property maintenance.
Evidence of Past Uses of Property	Trees from the former orchards and Christmas tree farm were present. These are overgrown and sporadic.
Potable Water Source	A single water supply well is present on-Site that was installed in the late 1990s. This well replaced a pre-existing well that was used for agricultural purposes. The current well produces potable water for the single-family residence.
Interior Drains? Where to?	No applicable
Sewage Disposal Source	On-site septic and drain field
Pools of Liquid / Odors?	None observed
Hydraulic equipment?	None observed

Site Visit Observations	
Storage tanks?	A gasoline Underground Fuel Storage Tank and Aboveground Fuel Storage Tank were removed from the Site in 1997.
Drums or Containers?	See hazardous materials section below.
Exterior Observations:	
Pits, Ponds, Lagoons?	None observed
Stained soil or pavement?	None observed
Waste water discharge?	No waste (process) water generated from on-site operations.
Wells or septic system?	Septic system on-site for existing house. One active domestic well that replaced the former domestic well in 1998. Old water supply well was impacted by the former fuel release with petroleum hydrocarbons.
Sumps?	None observed
Hazardous Materials?	Only small quantities of fuels and chemicals are present in the garage adjoining the residential dwelling.

Site Visit Observations	
Vicinity Observations:	
Topography of property and vicinity	Site topography is generally flat, however a large, inclined man-made hill is present in the northwestern portion of the property, possibly used to elevate farm equipment and materials above flood level.
Current uses of adjoining properties	▪ Northeast (down-gradient lands): Santa Teresa Blvd and residential neighborhoods ▪ Northwest (side-gradient lands): Watsonville Road, low density residences ▪ Southwest (up-gradient lands): Low density residential ▪ Southeast (side-gradient lands): Llagas Creek and open space
Any previous Environmental related reports?	Yes, see *Section 14.0 – References* and excerpts from historical reports in Appendix D. ▪ A prior Phase I ESA was completed in 2003 ▪ Reports pertaining to the historical fuel release (closed in November of 2000)

6.2 Summary of Site Inspection

In summary, the site inspection did not reveal any areas of environmental concern at the subject Site. An integrated summary and assessment of the accumulated Phase I ESA findings is presented in *Section 9.0 – Findings & Opinions*.

7.0 USER QUESTIONNAIRE & INTERVIEWS

7.1 User Questionnaire

A *User Questionnaire* was completed by Doug Blackwell, Blackrock, LLC.

User Questionnaire Summary	
Reason for Performing ESA?	Start of entitlement process
Environmental Leins?	No
Fair Market Value?	Yes, the purchase price reflects the fair market value.
Environmental Reports	Previous environmental assessment and former UST release investigation reports by Weber, Hayes and Associates.

7.2 Interviews

Interviews were conducted with available county environmental regulator(s). A historical site occupant was not available for interviewing. Copies of the documented interviews are available in *Appendix A*.

Interviewee	Date Conducted	Evidence Indicative of Chemical or Fuel Release at the Site?
Lani Lee Senior Hazardous Materials Specialist *Santa Clara County Department of Environmental Health (SCCDEH)*	07/01/13 Email, Phone	Ms. Lee assisted with reviewing records for the subject Site and retrieving well destruction records for the former monitoring wells at the Site. She and other staff personnel confirmed that there were no additional environmental records for the subject Site subsequent to the closure of the fuel release investigation in November of 2000. A follow-up email discussion with Ms. Lee confirmed that the low-level detections of dieldrin in several composite samples collected from shallow soils throughout the Site were not a concern to SCCDEH, however groundwater leachability concerns should be discussed with the CCRWQCB staff.
Thea Tryon Senior Engineering Geologist *Central Coast Regional Water Quality Control Board (CCRWQCB)*	08/13/13 Email	Ms. Tryon was contacted to determine potential Water Board requirements as a result of trace but elevated detections of dieldrin from three of the quadrants sampled for organochlorine pesticides (OCPs) (see section 8 below for details). She advised that one additional soil sample be collected from one of the impacted quadrants, and that the sample be analyzed for dieldrin via the STLC method (which evaluates potential leachability of the trace levels of dieldrin detected at the site).

7.3 Summary of Questionnaire/Interview Review

The questionnaire/interview is intended to identify previous or current land use that might cause potential environmental impacts. No additional areas of environmental concern were discovered during our review of the User Questionnaire, or our interviewing with site regulators.

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8.0 PHASE II SOIL, SOIL VAPOR AND GROUNDWATER INVESTIGATION

A *Limited Phase II Soil, Soil Vapor & Groundwater investigation* was completed in order to assess for any remaining elevated petroleum hydrocarbons from the former underground storage tank release as well potential shallow soil contamination from historical applications of agricultural chemicals within orchards and agricultural fields at the property. A summary of site-specific r*ecognized environmental conditions* and a summary of the former fuel release case history is presented in Section 10.0 – Findings and Opinions and detailed throughout Sections 4 - 7 of this report.

Advancing boring DP-1 downgradient of the former fuel release.

Driven Probe Boring Data			
Boring #	Depth to Groundwater	Temp Screen Interval	Total Depth of Boring
DP-1	15.4'	20-30'	32'
DP-2	12.3'	15-25'	25'
DP-3	12.3'	14-18'	24'
DP-4	16.6'	14-18'	32'

8.1 Field Investigation

Driven-Probe Operations:

Exploratory drilling was completed at the Site on July 12, 2013 using a truck-mounted GeoProbe® hydraulic driven-probe system operated by Environmental Control Associates, of Aptos, CA. A total of 4 driven probe (DP) samples were cored to groundwater and 5 shallow soil borings (SB) were cored strictly for inspection/testing of near surface soils. In addition, seven (7) composite samples ("comp-") were obtained from surface soils in the agricultural acreage to check for the presence of persistent pesticides (see Figure 5). Drilling and sampling followed our standard *Field Methodology for Hydraulic Driven Probes*, which is included in Appendix E. Soil boring permits are not required for subsurface investigation work in this portion of Santa Clara County.

Driven Prove Groundwater Sampling: Four borings (DP-1 through DP-4) were advanced to depths ranging from 20 to 32 feet below the ground surface (bgs). The borings were positioned at locations both downgradient and upgradient of the former UST and AST that were removed from the property in 1997. Based on groundwater data from the late 1990s fuel release investigation, we anticipated depth

to groundwater to be between 10 and 25 feet bgs and flow direction to be generally in a northeasterly direction following the course of the adjoining Llagas Creek (formerly called Coyote Creek in previous environmental reports).

Boring DP-1 and DP-2 were continuously cored to 23 and 25 feet bgs (detailed boring logs included in Appendix E). Groundwater was not producing at DP-1 so the boring was hydro-punched to a depth of 32 feet.

Borings DP-3 and DP-4 were hydropunched to depths of 28 and 32 feet bgs, then pulled back and screened from 14 to 18 feet bgs, with groundwater measured at depths of 12.3 and 16.6 feet bgs, respectively. Boring logs constructed for continuously cored borings DP-1 and DP-2 and field notes documenting the drilling program are provided in Appendix E.

Soil boring cores showing gravelly silty sand.

Soil Observations:

- Continuous-cored soils collected from DP-1 and DP-2 did not exhibit any indication of chemical related impacts (i.e., no visual, olfactory, or detections of VOCs with field PID).
- Continuously cored soil samples confirmed that the Site is underlain with relatively permeable gravelly silty sands to then less permeable sandy clay and clayey gravelly sand (detailed boring logs included in Appendix E). Groundwater was encountered at 15.4 and 12.3 feet bgs in borings DP-1 and DP-2.

Driven Probe Soil Sampling: Soil samples from DP-1 and DP-2 we collected from just above stabilized groundwater (i.e., the capillary fringe). The samples were collected at 12 and 10 feet bgs, respectively. The collected capillary fringe soil samples were submitted to a State-certified laboratory for the following analysis:

- VOCs by EPA Method 8260 (Volatile constituent fuel compounds)

In addition to the 4 driven probe (DP) borings, five (5) discrete shallow borings (SB-1 through SB-5) were also advanced at locations where agricultural equipment was stored and maintained. Each of these shallow borings were advanced to a depth of 4 feet bgs to inspect the soil for signs of impacts and to collect a soil sample from 2 feet bgs. The collected shallow boring samples were submitted to a State-certified laboratory for the following analysis:

- Total Petroleum Hydrocarbons (TPH) as Diesel and Motor Oil by LUFT/FFP

- VOCs by EPA Method 8260 (Volatile constituent fuel compounds)

Analytical results of the laboratory tested groundwater and soil samples from the driven probe borings DP-1 through DP-4, and SB-1 thorough SB-5 are tabulated on Tables 2 and 5, and presented graphically on Figures 6 and 9. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

Shallow Soil Composite Sampling Operations:

Seven (7) four-point composite samples were collected from a total of twenty-eight (28) near surface locations (i.e., Comp-1 through Comp-7) from locations targeting the agricultural portion of the property (see Figure 5 and Table 1). The near surface samples were collected from a depth of 3 to 6 inches bgs. The collected samples were submitted to a State-certified laboratory and analyzed for the following:

- Persistent Organochlorine Pesticides (OCPs) by EPA Method 8081A

In addition, a single discrete shallow soil sample was also gathered from one of the four locations from each quadrant, as indicated on Figure 5. These discrete samples were submitted to a State-certified laboratory for the following analysis:

- Arsenic by EPA Method 6010B

WHA field staff collecting soil vapor samples into summa canisters.

Due to slightly elevated concentrations of dieldrin detected in certain samples from the initial seven (7) four-point composite samples described above, some additional limited testing was completed to evaluate for the leachability potential of residual dieldrin present in shallow soils. One (1) discrete sample was taken at the center of Comp-3 (equidistant from the previous four Comp-3 composite sample locations). The discrete sample, "Comp-3-eS", was submitted to a State-certified laboratory for the following analysis:

- Dieldrin STLB by EPA Method 8081, Modified STLC Extract

The composite and discrete samples collected from this grid across the subject Site followed established protocols for assessing property transitioning from agricultural to residential land-use, as described in

the California Department of Toxic Substances Control (DTSC) *Interim Protocol for Sampling Agricultural Properties*[1].

Analytical results of the laboratory tested soil composite and discrete samples are tabulated on Table 1, and presented graphically on Figure 5. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

Soil Vapor Sampling Operations:

Four (4) temporary soil vapor borings (SV-1 through SV-4) were constructed at strategic locations in the vicinity of the former gasoline UST release at the property (see Figure 8 and Table 4). The soil vapor samples were collected using our *Field Methodology for Active Soil Gas Sampling*, which is presented in Appendix E. All of the samples were collected from depth of 5 feet bgs and submitted to a State-certified laboratory for the following analysis:

- TPH as Gasoline by EPA Method TO-3
- VOCs by EPA Method TO-15

Analytical results of the laboratory tested soil vapor samples are tabulated on Table 4, and presented graphically on Figure 8. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

Asbestos/Lead Surface Soil Sampling Operations:

Based upon the age of Site infrastructure and long-term agricultural equipment usage around the barn and residential garage, asbestos and lead sampling was conducted to evaluate for lead-based paint and asbestos impacts to shallow soil around the structures. Eight (8) surface soil samples (LA-1 through LA-8) were gathered at a depth of 3 inches bgs at locations around each of the historical buildings (see Figure 7 and Table 3). *Note: We advanced two of these borings along the observed footprint of the older historical residence, which is visible on historical aerial photographs dating back to 1939.*

These soil samples were each collected at a depth of 3 feet bgs and submitted to a State-certified laboratory for the following analysis:

- Lead by EPA Method 6010B
- Asbestos by EPA Method 600/R-93/116

Analytical results of the laboratory tested soil lead/asbestos samples are tabulated on Table 3, and presented graphically on Figure 7. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

[1]: *Interim Guidance for Sampling Agricultural Properties (Third Revision),* Department of Toxic Substances Control, dated August 7, 2008. This guidance document provides a sampling protocol for evaluating a former agricultural property that is known to have had or likely had uniformly applied organochlorine pesticides (OCPs). Based on the historical aerial maps for the subject Site showing orchards and row crops in portions of the Site, it is presumed that such pesticides were applied.

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8.2 Laboratory Analytical Results

The following subsections present the analytical results from the driven probe borings (groundwater and soil analysis), shallow soil composite sampling for persistent pesticides, soil vapor and shallow soil sampling adjoining the site structures for lead and asbestos. All samples were submitted to the following State-certified laboratories:

- *BC Laboratories, Inc., for soil and groundwater analyses*
- *Torrent Laboratory, Inc., for soil vapor analyses*
- *LA Testing, for soil asbestos analyses*

Driven Probe Groundwater Analytical Results:

The four (4) groundwater samples collected from borings DP-1 through DP-4 (see Figure 9 and Table 5 for complete dataset) revealed the following:

- Trace detections of **benzene** and **toluene** from DP-2, at 0.17 and 0.15 µg/L, respectively. Both detections are well below the Central Coast Region Water Quality Goals (WQGs) for benzene and toluene of 1.0 and 150 µg/L, respectively.
- All other samples were non-detectable for the petroleum hydrocarbons and constituent VOCs evaluated.

Driven Probe Soil Analytical Results:

The driven probe soil samples collected from borings DP-1, DP-2, and SB-1 through SB-5, revealed the following (see Figure 6 and Table 2 for complete dataset):

- Trace detections of **TPH as diesel** were present in borings SB-2 and SB-4, at 4.3 and 4.9 mg/kg, respectively. Both detections were well below the *Environmental Screening Level*[2] (ESL) of 83 mg/kg.
- All other constituents analyzed were non-detectable.

Shallow Soil OCP/Dieldrin STLC/Arsenic Analytical Results:

The shallow soil samples collected from the seven (7) quadrants throughout the historically agricultural portions of the Site (depicted on Figure 5 and presented on Table 1) revealed the following:

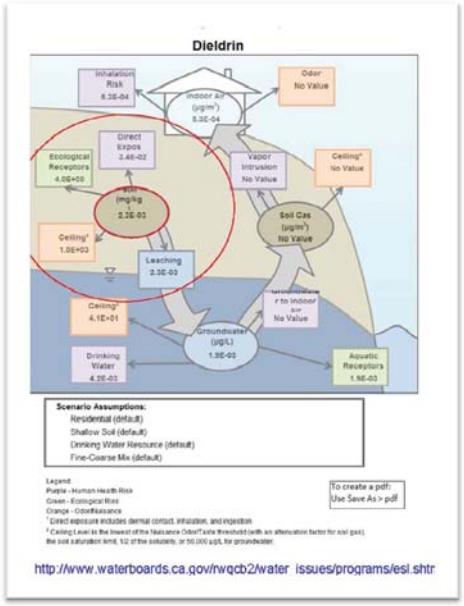
- Dieldrin: Sample composites Comp-3, Comp-4 and Comp-6 had detections of **dieldrin**[3] at 0.018, 0.0054 and 0.0068 mg/kg,

[2]: *Environmental Screening Levels (ESLs):* The California Regional Water Quality Control Board - San Francisco Bay Region developed these screening limits in a guideline document *("Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater",* Interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted based on conservative risk and leachability model inputs. The ESLs referenced here were obtained from the Table A. *Shallow Soils (<3m) where groundwater IS a current or potential Source of Drinking Water*.

- Residential *California Human Health Screening Levels*[4] *(*CHHSLs): These concentrations do not exceed the human health and safety threshold concentration for residential land use (i.e. concentrations were less than the established CHHSL of 0.035mg/kg ; or parts per million, ppm).

- Residential Environmental Screening Levels (ESLs): These concentrations did exceed the *leachable* ESL threshold for dieldrin (i.e., 0.0023 ppm, or 2.3 parts per billion). However, none of these detections exceed the residential ESL threshold concentration established the *direct exposure*, (nuisance), or *ecological risk* thresholds.

  In consultation with lead Water Board staff[5], confirmation laboratory re-analysis was completed on soil collected from the Site quadrant having the highest total dieldrin concentrations (sample Comp-3-eS, Figure 5, Table 1). This soil sample was tested to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis results confirmed the site-specific leachable concentrations were non-detectable (<0.0000031 mg/L, or ppm), which is below the drinking water standard of 0.0000048 mg/L). Therefore the trace, residual concentrations of Dieldrin detected at the Site are not considered to be a threat to shallow groundwater beneath the Site.



[3]: Dieldrin is a chlorinated insecticide that was historically used as an alternative to DDT (common name for 4,4-DDT), particularly from the 1950s through 1970s.

[4]: California Human Health Screening Levels for Soil (CHHSLs): The CHHSLs are health-based guideline concentrations established for 54 common Hazardous *Chemicals of Concern* found in in soil or soil gas. The California Environmental Protection Agency (Cal/EPA) considers detection at or below these established threshold concentrations pose insignificant risk to human health and safety. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

[5]: CRWQCB Central Coast Water Board, Site Cleanup and Land Disposal Program, August 13, 2013.

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shallow groundwater beneath the Site.

- DDx compounds: The persistent organochlorine pesticide dichlorodiphenyltrichloroethane (DDT) and its metabolites DDD, and DDE (DDx) were detected at trace concentrations, which is consistent with long term agricultural land use.
  - Trace detections of **4,4-DDE** ranging from 0.00014 to 0.011 mg/kg were present in all seven sample composites. These detections were all below the residential land-use ESL and CHHSL for 4,4'DDE of 1.7 and 1.6 mg/kg.
  - Trace detections of **4,4-DDT** ranging from 0.00073 to 0.0053 were present in composite Comp-1, Comp-3, Comp-6 and Comp-7. These detections were all below the residential land-use ESL and CHHSL for 4,4'DDT of 1.7 and 1.6 mg/kg.
  - A single trace detection of **4,4-DDD** from sample composite at 0.0012 mg/kg, well below the residential land-use ESL and CHHSL of 2.4 and 2.3 mg/kg.
- Arsenic All of the discrete samples (Comp-1-c, Comp-2-d, Comp-3-c, Comp-4-a, Comp-5-b, Comp-6-d and Comp-7-b) had detections of naturally-occurring **arsenic** ranging from 2.9 to 3.9 mg/kg. These concentrations are well within the range of naturally occurring arsenic concentrations in this region[6], and do not appear to be a result of historically agricultural operations. These naturally-occurring concentrations of arsenic exceed the soil screening thresholds established in the ESLs/CHHSLs but are not considered a land use health risk because they are naturally occurring concentrations.
- All other pesticide compounds were non-detectable.

In summary, all tested persistent pesticide compounds came back as non-detect except for some trace detections of DDT (< 0.2 mg/kg) and Dieldrin (<0.018 mg/kg). Arsenic concentrations are well within the range of naturally occurring concentrations for the region. No human health and safety CHHSLs were exceeded (see attached table). Solubility analysis confirmed the leachable concentrations of the persistent pesticide dieldrin were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site.

Soil Vapor Analytical Results:

The soil vapor samples collected from the four (4) temporary soil vapor probes positioned throughout the historical UST fuel release zone revealed the following (see Figure 8 and Table 4 for complete dataset):

- Low-level detections of **TPH as gasoline** in samples SV-2 through SV-4, ranging from 160 to 550 µg/m^3, well below the residential ESL of 370,000 µg/m^3.

[6]: *Interim Guidance for Sampling Agricultural Properties (Third Revision),* Department of Toxic Substances Control, dated August 7, 2008. This guidance document states that, "If all the arsenic results for the site are at or below 12 mg/kg, then collection of background samples will not be required".

- Low-level detections of **benzene** in samples SV-2 and SV-4, at 4.64 and 3.22 µg/m^3, respectively. Both detections were well below the residential CHHSL and ESL for benzene of 36.2 and 42 µg/m^3.
- Low-level detections of **ethylbenzene** in samples SV-2 and SV-4, at 4.9 and 5.43 µg/m^3, respectively. Both detections were well below the residential ESL for ethylbenzene of 490 and 42 µg/m^3.
- A single low-level detection of **toluene** in sample SV-4, at 2.21 µg/m^3, well below the residential ESL and CHHSL for benzene of 135,000 and 160,000 µg/m^3.
- All other constituents analyzed were non-detectable.

Asbestos/Lead Soil Analytical Results:

The surface soil samples collected from eight (8) locations along current and historical Site structures (LA-1 through LA-8), revealed the following (see Figure 9 and Table 5 for complete dataset):

- Surface samples LA-1, LA-3 and LA-6 had detections of **lead** at 150, 86 and 85 mg/kg, respectively. These detections exceeded the residential ESL and CHHSL for lead in shallow soil of 80 mg/kg.
- Asbestos was not detected in any of the surface samples.

This concludes our presentation of the analytical results from the Phase II sampling program. Opinions regarding these results are presented in Section 10.3 below.

9.0 DATA GAPS

No significant data gaps were encountered during the course of this investigation. We encountered one minor data gap. Specifically, no site contact was available to verify that the parcel has remained unused for any commercial purposes subsequent to the 2003 Phase I ESA. The current Site occupant is a residential tenant and was not available for interviewing. However, based on our visual inspection of the property, there were no indications of any significant changes to Site infrastructure or commercial activities subsequent to 2003.

10.0 FINDINGS & OPINIONS

10.1 Subject Site Phase I Findings

The following environmental conditions were noted for the subject Site, based upon a review of historical information, regulatory records and a site inspection / tenant interview. Specifically, the following information was gathered:

1. Closed Fuel Release Case (LUST): We reviewed of the case history for a historical fuel release at the Site that was closed in 2001. A summary of the case history is presented in Section 5.1.

Opinion: The presence of this closed fuel release **is considered a *historical recognized environmental condition* (HREC).**

2. Historical Agricultural Land Use: Historical aerials show the site has been continuously farmed for over 70 years.

   Opinion: Persistent pesticide residues are considered a potential recognized environmental condition particularly with a land use transition to residential.

10.2 Adjoining / Surrounding Phase I Findings

Our review of historical and regulatory records for adjoining/nearby properties did not reveal any areas of concern.

1. Closed Upgradient / Sidegradient Fuel Release Case (LUST): Former Rist Quarry: We reviewed of the case history for a historical fuel release at 14905 Watsonville Road, which lay approximately 550 feet west of the Site perimeter. A summary of the case history is presented in Appendix D.

   Opinion: The presence of this closed fuel release **is considered a *de minimis environmental condition*.**

10.3 Phase II Sampling Program Findings

A *Limited Phase II Soil, Soil Vapor & Groundwater investigation* was completed to address potential contaminants of concern associated with REC's and land use transition from agricultural to residential. Primarily, sampling was completed to confirm whether or not there are any remaining elevated petroleum hydrocarbons from the former underground storage tank release as well potential shallow soil contamination from historical applications of agricultural chemicals within orchards and agricultural fields at the property.

The Phase II sampling program revealed the following:

- Sampling results targeting the former fuel release: No further action will be required. Groundwater, soil and soil vapor samples analyzed for petroleum hydrocarbons around the former fuel release yielded only a few trace detections of diesel and constituent volatile organic compounds (VOCs).
- Sampling results targeting lead-based paint and asbestos around Site infrastructure: Some limited soil scraping from 3 areas around the perimeter foundations will need to be completed (during, or prior to property development) to get rid of a limited volume of soil apparently impacted by lead-based paint scrapings. No detections of asbestos were found in the soil samples (FYI: Lead Results on Figure 7 and Table 3, attached).
- Sampling results targeting transition from agricultural land use to residential land use: All soil sampling results contained some limited detections of this persistent pesticide compound but the concentrations were all below the screening limits for residential health and safety concerns (i.e., CHHSL guidelines, results of shallow soil testing is shown on Figure 5 and Table 1).

However, some of these trace detections exceeded the leachability threshold established in the Water Board's *Environmental Screening Limits* (ie., ESL guidelines). In consultation with lead Water Board staff, laboratory reanalysis was completed on soil collected from the Site quadrant having the highest total dieldrin concentrations. This soil sample was re-analyzed to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis confirmed the site-specific leachable concentrations were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site.

11.0 CONCLUSIONS & RECOMMENDATIONS

We have performed a *Phase I Environmental Site Assessment* in accordance with the scope and limitations of *ASTM Practice E 1527* for a property located at 14905 Santa Teresa Boulevard in Morgan Hill. There were no exceptions to, or deletions from, this practice (i.e. data gaps), as described in Section 8.0 of this report.

This assessment did not reveal evidence of ***recognized environmental conditions*** at the subject property. However, in preparation for proposed redevelopment, a Phase II sampling program was conducted.

Based on these results, we conclude there are no environmental impediments for residential land use.

12.0 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all other warranties, express or implied. This report has been prepared solely for our client. The assessment is provided so the client may make a more informed decision as to Site conditions. This report shall not be relied upon by, or transferred to, any other party without expressed permission by our client. This ESA is not a regulatory compliance audit or an evaluation of the efficiency of the use of any hazardous materials at the Site. Unless otherwise stated no evaluation for the presence of asbestos-containing building materials, lead-based paint, urea-formaldehyde foam insulation, or other potentially hazardous building materials; methane; radon gas; lead in drinking water; or wetlands, is included in our assessment.

Our findings and opinions are based on information collected from regulatory agency files and lists, interviews, and Site conditions at the time of our Site reconnaissance. Note that our findings and opinions are based on information that we obtained on specific dates through records review, Site reconnaissance, and related activities. It is possible that other information exists or subsequently has become known, just as it is possible for conditions we observed to have changed after our observations.

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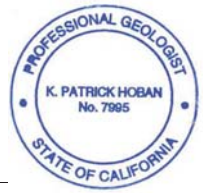
The accuracy and thoroughness of any environmental assessment depend on a variety of factors and optimally will include soil and groundwater sampling. Weber, Hayes and Associates cannot and will not provide guarantees, certifications or warranties that the investigated property is or is not free of environmental impairment. Any person who is aware of any *recognized environmental conditions* of the Site or surrounding areas that are different from those described in the report should report them immediately to this office for evaluation as part of an additional scope of work.

Thank you for this opportunity to be of service. Should you have any questions or comments regarding this project, please contact us at our offices.

Respectfully submitted,

WEBER, HAYES AND ASSOCIATES

A California Corporation



By: _____
Pat Hoban
Senior Geologist

By: _____
Jered Chaney
Project Geologist

And: _____
Jacob Aman
Staff Scientist

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13.0 QUALIFICATION OF ENVIRONMENTAL PROFESSIONAL

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10[7] of this part.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

By _____

Pat Hoban
Senior Geologist

[7] ASTM Standard E 1527-05, X2.1.1 and Federal Register 40 CFR Part 312, §312.10:
Environmental Professional means:

(1) A person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases…on, at, in, or to a property, sufficient to meet the objectives and performance factors...

(2) Such a person must:

(i) Hold a current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) and have the equivalent of three (3) years of full-time relevant experience; or

(ii) Be licensed or certified by the federal government, a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) to perform environmental inquiries … and have the equivalent of three (3) years of full-time relevant experience; or

(iii) Have a Baccalaureate or higher degree from an accredited institution of higher education in a discipline of engineering or science and the equivalent of five (5) years of full-time relevant experience; or

(iv) Have the equivalent of ten (10) years of full-time relevant experience...

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14.0 REFERENCES

STANDARDS, GUIDANCE DOCUMENTS & DATABASES

ASTM E1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*; 2005

ASTM E2600-10, Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions, 2010.

California Human Health Screening Levels (CHHSLs) – Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties, California Environmental Protection Agency, January 2005.

California State Online GeoTracker Database, www.geotracker.swrcb.ca.gov, 2013.

Santa Clara County Department of Environmental Health LUSTOP website, http://lustop.sccgov.org/, 2013

Interim Guidance for Sampling Agricultural Properties (Third Revision), Department of Toxic Substances Control, dated August 7, 2008.

SUBJECT SITE: ENVIRONMENTAL REPORTS, REGULATORY LETTERS & RELATED DOCUMENTS

Well Abandonment, Finalizing Site Closure: Ruth Jones Property, Weber, Hayes and Associates, dated April 16, 2001.

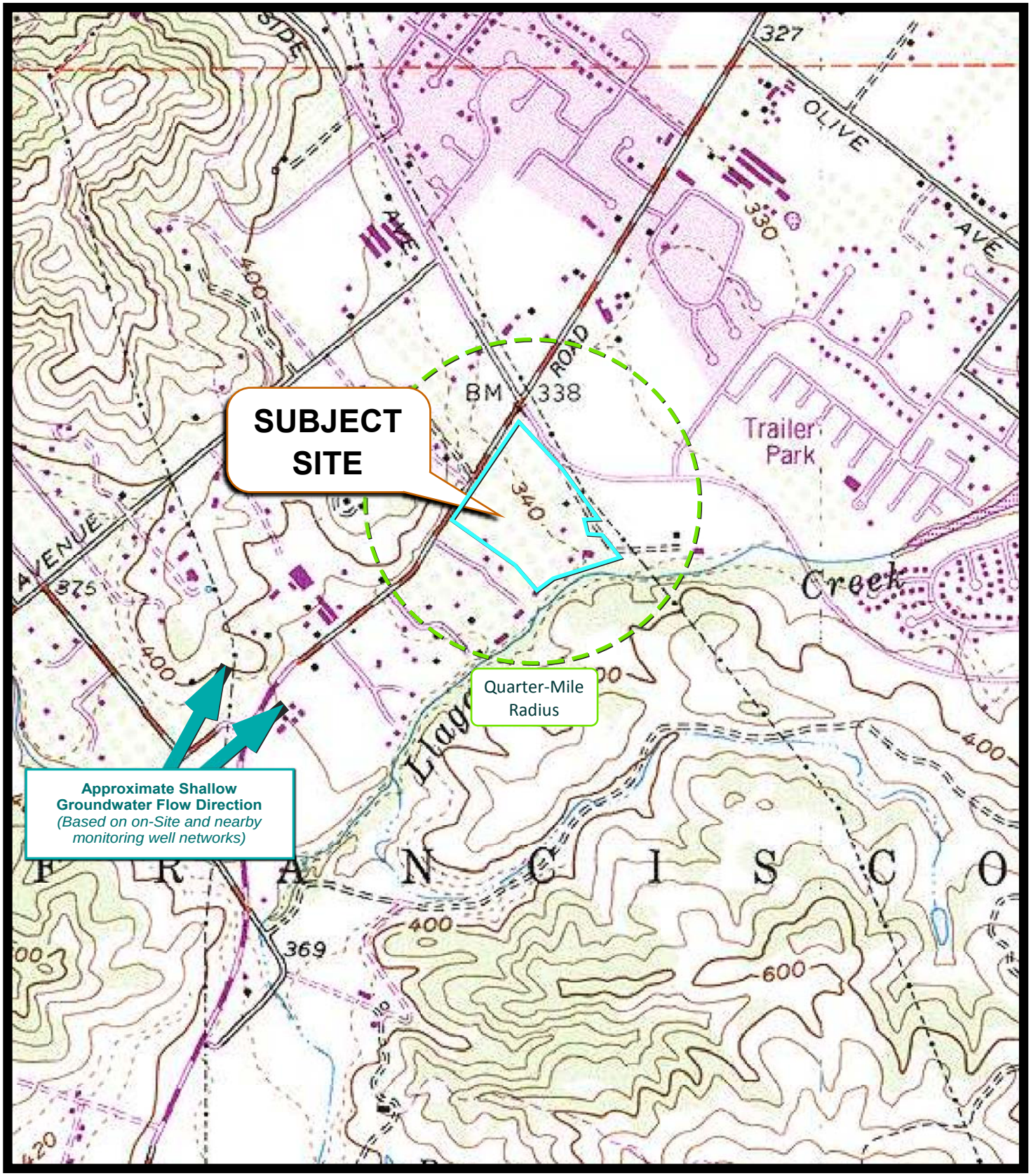
Fuel Leak Site Case Closure—Ruth jones Residnce, 14905 Santa Teresa Boulevard, Morgan Hill, CA; Case No. 14-417, Leaking Underground Storage Tank Oversight Program, dated January 9, 2001.

Case Closure Summary: Leaking Underground Storage Tank Program: Ruth Jones Residence, State Water Resources Control Board, dated November 28, 2000.

VICINITY SITES: ENVIRONMENTAL REPORTS, REGULATORY LETTERS & RELATED DOCUMENTS

Fuel Leak Site Case Closure—Rist Quarry, 14905 Watsonville Road, Morgan Hill, CA; Case No. 14-066, Leaking Underground Storage Tank Oversight Program, dated April 4, 1996.

Case Closure Summary: Leaking Underground Storage Tank Program: Rist Quarry, State Water Resources Control Board, dated February 28, 1996.



Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

Location Map
Phase I Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

Figure 1
Job # 2X330

Figure 2
Project 2X330

Vicinity Map
Phase I/II Environmental Site Assessment
14905 Santa Teresa Boulevard
Morgan Hill, California

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Figure 3
Project 2X330

Site Map
Phase I/II Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

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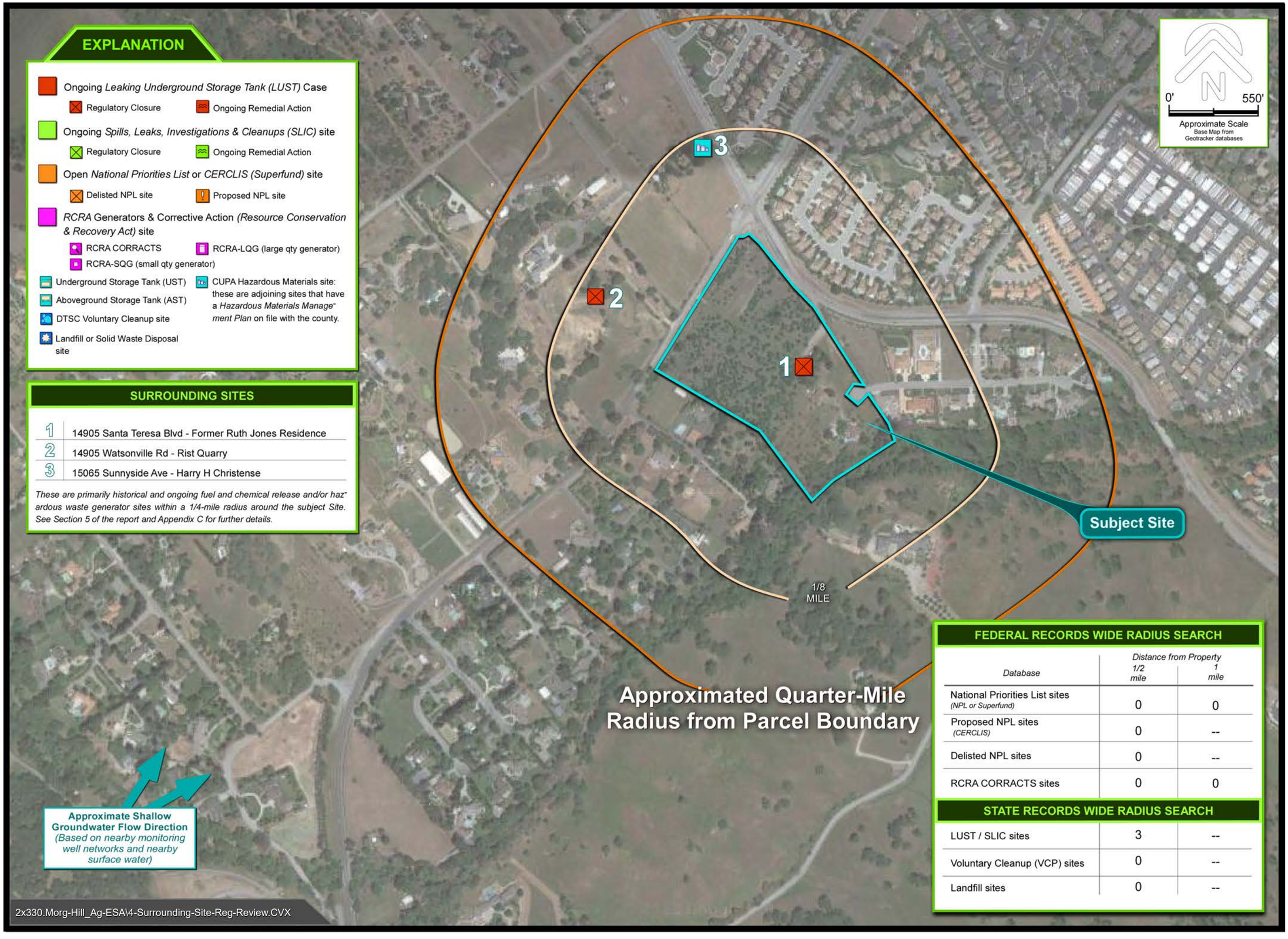


Figure 4
Project 2X330

Surrounding Site Regulatory Review
Phase I/II Environmental Site Assessment
14905 Santa Teresa Boulevard
Morgan Hill, California

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

0' 140'
Approximate Scale
Base Map from Google Maps

Comp-2 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.00041 J mg/kg
4,4'-DDT: ND
Dieldrin: 0.00031 J mg/kg
Endrin: ND

Arsenic: **3.0** mg/kg
(Comp-2-d)

Comp-4 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0017 mg/kg
4,4'-DDT: ND
Dieldrin: 0.0054 mg/kg
Endrin: ND

Arsenic: **3.4** mg/kg
(Comp-4-a)

Closed LUST Fuel Release
(14905 Watsonville Road)

Comp-3 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0011 mg/kg
4,4'-DDT: 0.00073 mg/kg
Dieldrin: 0.018 mg/kg
Endrin: ND

Arsenic: **3.4** mg/kg
(Comp-3-c)

***Comp-3-eS**
Dieldrin (STLC): ND

Comp-5 (a,b,c,d)
4,4'-DDD ND
4,4'-DDE: 0.00014 J mg/kg
4,4'-DDT: ND
Dieldrin: 0.00019 J mg/kg
Endrin: ND

Arsenic: **3.9** mg/kg
(Comp-5-b)

Comp-6 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0032 mg/kg
4,4'-DDT: 0.0016 mg/kg
Dieldrin: 0.0068 mg/kg
Endrin: ND

Arsenic: **3.7** mg/kg
(Comp-6-d)

Comp-7 (a,b,c,d)
4,4'-DDD: 0.0012 mg/kg
4,4'-DDE: 0.011 mg/kg
4,4'-DDT: 0.0053 mg/kg
Dieldrin: 0.00089 mg/kg
Endrin: ND

Arsenic: **2.9** mg/kg
(Comp-7-b)

Comp-1 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0024 mg/kg
4,4'-DDT: 0.0049 mg/kg
Dieldrin: 0.00040 J mg/kg
Endrin: 0.00059 mg/kg

Arsenic: **3.3** mg/kg
(Comp-1-c)

COMP 1
COMP 2
COMP 3
COMP 4
COMP 5
COMP 6
COMP 7
DP-1
DP-2
DP-3
DP-4
SV-1
SV-2
SV-3
SV-4
Old House
Barn
Garage
Residence
WATSONVILLE ROAD
WAY

Approximate Shallow Groundwater Flow Direction
(Based on nearby monitoring well networks and nearby surface water)

2x330.Morg-Hill_Ag-ESA\Figures\5-Site-Map w Soil Results.CVX

Explanation

Comp-1 (a,b,c,d)
4,4'-DDD ND
4,4'-DDE: 0.0024 mg/kg
4,4'-DDT: 0.0049 mg/kg
Dieldrin: 0.00040 J mg/kg
Endrin: 0.00059 mg/kg

Arsenic: **3.3** mg/kg
(Comp-1-c)

Organochlorine Pesticide and Arsenic Analytical Results
4-Point composite samples "⊠" (**a**, **b**, **c**, and **d**) analyzed for Persistent Organochlorine Compounds by EPA #8081A.

Discrete samples "⊠ " (*either* **a**, **b**, **c**, or **d**) analyzed for Arsenic by EPA #6010.B

All results given in mg/kg.

- Proposed Boring Location for Soil / Groundwater
- Proposed Soil Vapor Sample Location
- Four-Point Composite Pesticide Sample Locations
  - 28 samples points across 7 quadrants
  - 1 arenic sample / quadrant = 7 arsenic samples
- Additional Sample for Dieldrin STLC
- Lead/Asbestos Samples Adjoining Structures
- Water Supply Well and Water Storage Tank
- Former UST Location
- Former AT Location

* = Due to slightly elevated concentrations of Dieldrin detected in certain shallow-soil composite samples, additional limited testing was completed to evaluate for the leachability potential of residual dieldrin present in shallow soils. The sample "Comp-3-eS" was taken from the center of quadrant "Comp-3" and tested for leachable Dieldrin by EPA Method 8081, Modified STLC Extract.

Figure 5
Project 2X330

Composite Soil Sample Results for OCPs (Persistent Pesticides) and Discrete Sample Results for Arsenic
Phase I/II Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

EXPLANATION

SB-2
Depth = 2 feet
B-T-E-X: ND
TPH-d: 4.9
TPH-mo: ND

Grab Groundwater Analytical Results
Samples analyzed for Volatile Organics (EPA #8260), TPH-d and TPH-mo (Luft/FPP)

All results given in mg/kg.

ND = Not detected at or above the Laboratory Reporting Limit
NA = Not analyzed for specific constituent

Constituent	Laboratory Reporting Limits (RL)
Benzene:	0.0050
Toluene:	0.0050
Ethyl-benzene:	0.0050
Total Xylenes:	0.010
TPH-d:	20
TPH-mo:	10

- Driven Probe Boring Location for Soil / Groundwater
- Soil Boring Location for Soil
- Soil Vapor Sample Location
- Four-Point Composite Pesticide Sample Locations
  - 28 samples points across 7 quadrants
  - 1 arenic sample / quadrant = 7 arsenic samples
- Lead/Asbestos Samples Adjoining Structures
- Water Supply Well and Water Storage Tank
- Former UST Location
- Former AT Location

N
0' 140'
Approximate Scale
Base Map from Google Maps

COMP 1
COMP 2
COMP 3
COMP 4
COMP 5
COMP 7
DP-1 *Depth* = 12 feet B-T-E-X: ND TPH-d: NA TPH-mo: NA
DP-2 *Depth* = 10 feet B-T-E-X: ND TPH-d: NA TPH-mo: NA
DP-3
DP-4
SB-1 *Depth* = 2 feet B-T-E-X: ND TPH-d: ND TPH-mo: ND
SB-2 *Depth* = 2 feet B-T-E-X: ND TPH-d: 4.9 TPH-mo: ND
SB-3 *Depth* = 2 feet B-T-E-X: ND TPH-d: ND TPH-mo: ND
SB-4 *Depth* = 2 feet B-T-E-X: ND TPH-d: 4.3 TPH-mo: ND
SB-5 *Depth* = 2 feet B-T-E-X: ND TPH-d: ND TPH-mo: ND
SV-4
Old House
Barn
Residence
SECRETARIAT WAY
WATSONVILLE

Approximate Shallow Groundwater Flow Direction
(Based on nearby monitoring well networks and nearby surface water)

2x330.Morg-Hill_Ag-ESA\Figures\6-Site-Map w Soil TPH and VOC Results.CVX

Figure 6
Project 2X330

Soil Sample Results for Fuel Contaminants of Concern (Total Petroleum Hydrocarbons & Constituent Compounds)

Phase I/II Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

EXPLANATION

Sample Locations with Lead and Asbestos Analytical Results

LA-1
Depth = 3"
Lead: 150
Asbestos: ND

Surface Grab Soil samples taken at 3" below ground surface at the bases of current or previous structures. All samples were analyzed for Lead (EPA Method 6010B) by BC Labs and for Asbestos (EPA Method 600/R-93/116) by LA Testing.

Note: EPA Method 600/R-93/116 for Asbestos is a qualitative method and does not have a PQL.

All results given in mg/kg.

- Driven Probe Boring Location for Soil / Groundwater
- Soil Boring Location for Soil
- Soil Vapor Sample Location
- Four-Point Composite Pesticide Sample Locations
  - 28 samples points across 7 quadrants
  - 1 arenic sample / quadrant = 7 arsenic samples
- Lead/Asbestos Samples Adjoining Structures
- Water Supply Well and Water Storage Tank
- Former UST Location
- Former AT Location

N

0' 140'

Approximate Scale
Base Map from Google Maps

WATSONVILLE ROAD

SECRETARIAT WAY

COMP 2
COMP 3
COMP 4
COMP 5
COMP 6
COMP 7
MP 1

DP-4

Old House
Barn
Garage
Residence

SV-1
SV-2
SV-3
SV-4

LA-1
Depth = 3"
Lead: 150
Asbestos: ND

LA-2
Depth = 3"
Lead: 31
Asbestos: ND

LA-3
Depth = 3"
Lead: 86
Asbestos: ND

LA-4
Depth = 3"
Lead: 56
Asbestos: ND

LA-5
Depth = 3"
Lead: 37
Asbestos: ND

LA-6
Depth = 3"
Lead: 85
Asbestos: ND

LA-7
Depth = 3"
Lead: 56
Asbestos: ND

LA-8
Depth = 3"
Lead: 13
Asbestos: ND

Approximate Shallow Groundwater Flow Direction
(Based on nearby monitoring well networks and nearby surface water)

2x330.Morg-Hill_Ag-ESA\Figures\7-Site-Map w Grab Soil Lead and Asb. Results.CVX

Figure 7
Project 2X330

Soil Sample Results for Lead and Asbestos

Phase I/II Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

EXPLANATION

SV-2
(Depth: 5 feet)
TPG-g: 550* ug/m³
Benzene: 4.64 ug/m³
Toluene: ND
Ethyl-benzene: 4.90 ug/m³
All others: ND

Soil Vapor Analytical Analytical Results
Samples analyzed for TPH-g by EPA Method TO-3 and for Toxic Organics by EPA Method TO-15.

All results given in ug/m³.

* = Does not match pattern of reference Gasoline standard. Hydrocarbons in the range of C5-C12 quantified as Gasoline.
ND = Not detected at or above the Laboratory Reporting Limit (RL)

Laboratory Reporting Limits (RL)
TPH-g: 57 ug/m³
Benzene: 1.6 ug/m³
Toluene: 1.9 ug/m³
Ethyl-benzene: 2.2 ug/m³
Total Xylenes: 6.5 ug/m³
MTBE: 1.8 ug/m³
TBA: 8.4 ug/m³

- Proposed Boring Location for Soil / Groundwater
- Proposed Soil Vapor Sample Location
- Four-Point Composite Pesticide Sample Locations
  - 28 samples points across 7 quadrants
  - 1 arenic sample / quadrant = 7 arsenic samples
- Lead/Asbestos Samples Adjoining Structures
- Water Supply Well and Water Storage Tank
- Former UST Location
- Former AT Location

0' 140'
Approximate Scale
Base Map from Google Maps

COMP 1
COMP 2
COMP 3
COMP 4
COMP 5
COMP 7

SV-1
(Depth: 5 feet)
TPG-g: ND
Benzene: ND
Toluene: ND
Ethyl-benzene: ND
All others: ND

SV-2
(Depth: 5 feet)
TPG-g: 550* ug/m³
Benzene: 4.64 ug/m³
Toluene: ND
Ethyl-benzene: 4.90 ug/m³
All others: ND

SV-3
(Depth: 5 feet)
TPG-g: 160* ug/m³
Benzene: ND
Toluene: ND
Ethyl-benzene: ND
All others: ND

SV-4
(Depth: 5 feet)
TPG-g: 220* ug/m³
Benzene: 3.22 ug/m³
Toluene: 2.21 ug/m³
Ethyl-benzene: 5.43 ug/m³
All others: ND

Old House
Barn
Garage
Residence
SV-1
SV-2
SV-3
SV-4
DP-1
DP-2
WATSONVILLE
AT WAY

Approximate Shallow Groundwater Flow Direction
(Based on nearby monitoring well networks and nearby surface water)

2x330.Morg-Hill_Ag-ESA\Figures\8-Site-Map w Soil Vapor Results.CVX

Figure 8
Project 2X330

Soil Vapor Sample Results
Phase I/II Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

EXPLANATION

DP-2
Depth to GW = 12.3'
Screen Interval = 15-25'
Benzene: 0.17 J
Toluene: 0.15 J
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND

Grab Groundwater Analytical Results
Samples analyzed for Volatile Organics (EPA #8260), TPH-d (EPA #8015B), and TPH-g (Luft/GC/MS)

All results given in ug/L.

Constituent	Laboratory Reporting Limits (RL)	Central Coast Region Water Quality Goals (WQG)
Benzene:	0.50	1
Toluene:	0.50	150
Ethyl-benzene:	0.50	300
Total Xylenes:	1.0	1,750
TPH-g:	50	1,000
TPH-d:	40	1,000

- Driven Probe Boring Location for Soil / Groundwater
- Soil Boring Location for Soil
- Soil Vapor Sample Location
- Four-Point Composite Pesticide Sample Locations
  - 28 samples points across 7 quadrants
  - 1 arenic sample / quadrant = 7 arsenic samples
- Lead/Asbestos Samples Adjoining Structures
- Water Supply Well and Water Storage Tank
- Former UST Location
- Former AT Location

DP-4
Depth to GW = 16.6'
Screen Interval = 14-18'
Benzene: ND
Toluene: ND
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND

DP-1
Depth to GW = 21.8'
Screen Interval = 20-30'
Benzene: ND
Toluene: ND
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND

DP-3
Depth to GW = 12.3'
Screen Interval = 20-24'
Benzene: ND
Toluene: ND
Ethylbenzene: ND
Xylenes: ND
MTBE ND
TPH-d: ND
TPH-g: ND

DP-2
Depth to GW = 12.3'
Screen Interval = 15-25'
Benzene: 0.17 J
Toluene: 0.15 J
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND

COMP 2
COMP 3
COMP 4
COMP 5
COMP 6
COMP 7
Old House
Barn
Garage
Residence
SV-1
SV-3
SV-4
WATSONVILLE
SECRETARIAT WAY

N
0' 140'
Approximate Scale
Base Map from Google Maps

Approximate Shallow Groundwater Flow Direction
(Based on nearby monitoring well networks and nearby surface water)

2x330.Morg-Hill_Ag-ESA\Figures\9-Site-Map w Grab GW TPH and VOC Results.CVX

Figure 9
Project 2X330

Grab Groundwater Sample Results for Fuel Contaminants of Concern (Total Petroleum Hydrocarbons & Constituent Compounds)

Phase I/II Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

TABLES

Table 1: Soil Sample Results
Persistent Organochlorine Pesticide (OCP) and Arsenic Analysis
14905 Santa Teresa Boulevard, Morgan Hill, California

All soil results are in parts per million (mg/kg).

Sample Information			Metals by EPA #6010.B	Persistent Organochlorine Compounds by EPA #8081A																	
Sample ID#	**Sample Type** *(discrete or composite)*	**Depth** (inches below ground surface)	**Arsenic**	**4,4'-DDD**	**4,4'-DDE**	**4,4'-DDT**	**Aldrin**	**Alpha-BHC** (HCH alpha)	**Beta-BHC** (HCH beta)	**Chlordane (technical)**	**delta-BHC** (HCH delta)	**Dieldrin**	***Soluble Dieldrin (mg/L)**	**Endosulfan I**	**Endosulfan II**	**Endosulfan Sulfate**	**Endrin**	**Endrin Aldehyde**	**Lindane** (Gamma-BHC)	**Heptachlor**	**Heptachlor Epoxide**	**Methoxychlor**	**Toxaphene**
Comp-1 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	ND	0.0024	0.0049	ND	ND	ND	ND	ND	0.00040 J	--	ND	ND	ND	0.00059	ND	ND	ND	ND	ND	ND
Comp-1-c	**Discrete**	3 - 6"	**3.3**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Comp-2 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	ND	0.00041 J	ND	ND	ND	ND	ND	ND	0.00031 J	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Comp-2-d	**Discrete**	3 - 6"	**3.0**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Comp-3 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	ND	0.0011	0.00073	ND	ND	ND	ND	ND	**0.018**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Comp-3-c	**Discrete**	3 - 6"	**3.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Comp-3-eS	**Discrete**	3 - 6"	**--**	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--
Comp-4 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	ND	0.0017	ND	ND	ND	ND	ND	ND	**0.0054**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Comp-4-a	**Discrete**	3 - 6"	**3.4**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Comp-5 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	ND	0.00014 J	ND	ND	ND	ND	ND	ND	0.00019 J	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Comp-5-b	**Discrete**	3 - 6"	**3.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Comp-6 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	ND	0.0032	0.0016	ND	ND	ND	ND	ND	**0.0068**	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Comp-6-d	**Discrete**	3 - 6"	**3.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Comp-7 (a,b,c,d)	**Composite** (4-point)	3 - 6 "	--	0.0012	0.011	0.0053	ND	ND	ND	ND	ND	0.00089	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Comp-7-b	**Discrete**	3 - 6"	**2.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Laboratory Reporting Limit (RL):			1.0	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.050	0.00050	0.00050	0.0000031	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.050
Environmental Screening Levels [1] **Screening Levels Residential / Industrial**			**0.39 / 40**	**2.4 / 290**	**1.7 / 4.0**		**0.032 / 0.35**	**--**	**--**	**0.44 / 15**	**--**	**0.0023 / 0.0023**	**0.0000042**	**0.0046 / 0.0046**			**0.00065 / 0.00065**		**--**	**0.013 / 0.013**	**0.014 / 0.014**	**19 / 19**	**0.00042 / 0.00042**
CHHSLs [2] **Screening Levels Residential / Industrial**			**0.070 / 0.24**	**2.3 / 9.0**	**1.6 / 6.3**		**0.033 / 0.13**	**--**	**--**	**0.43 / 1.7**	**--**	**0.035 / 0.13**	**--**	**--**			**21 / 230**		**0.5 / 2.0**	**0.13 / 0.52**		**340 / 3,800**	**0.46 / 1.8**

Notes

1 = Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entiled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted. The ESLs used for this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water. The ESL document catogorizes TPH as either gasoline, middle distillates, or residual fuels. "Middle distillates" are considered to include diesel fuel, kerosene, stoddard solvent, heating fuel, and jet fuel, whereas "residual fuels" include fuel oil (bunker fuel), lubricating oils (motor oil, oil and grease, waste oils) and asphalts.

2 = California Human Health Screening Levels for Soil (CHHSLs): The California Human Health Screening Levels are concentrations of 54 Hazardous Chemicals in soil or soil gas that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

ND = Not Detected at or above the laboratory RL.

J = Laboratory reports values reported between MDL and RL should be considered as estimated

< # = Reporting limit elevated due to laboratory sample dilution. Value reported as less than elevated laboratory reporting limit, X.

BOLD = Analytical results above CHHSL or ESL

* = Due to the slightly elevated detections of Dieldrin from the Comp-3 sampling quandrant, some additional limited testing was completed to evaluate for the leachability potential of residual Dieldrin present in shallow soils. A discrete sample (Comp-3-eS) was taken from the center of the original Comp-3 quadrant and tested for leachable Dieldrin by EPA Method 8081, Modified STLC Extract. The result was non-detect. Note: The comparable ESL for leachable Dieldrin is the drinking water ESL = 0.0000042 mg/L (parts per million)

Table 2: Soil Sample Results, July 12, 2013
Total Petroleum Hydrocarbons and Volatile Organic Analysis

14905 Santa Teresa Boulevard, Morgan Hill, California

All soil results are in parts per million (mg/kg).

Sample Information			Total Petroleum Hydrocarbons by LUFT/FFP		Volatile Organic Analysis by EPA #8260				
Sample ID#	**Sample Type *(discrete or composite)***	**Depth (feet below ground surface)**	**Diesel**	**Motor Oil**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**MTBE**
DP-1	**Discrete**	12'	--	--	ND	ND	ND	ND	ND
DP-2	**Discrete**	10'	--	--	ND	ND	ND	ND	ND
SB-1	**Discrete**	2'	ND	ND	ND	ND	ND	ND	ND
SB-2	**Discrete**	2'	4.9	ND	ND	ND	ND	ND	ND
SB-3	**Discrete**	2'	ND	ND	ND	ND	ND	ND	ND
SB-4	**Discrete**	2'	4.3	ND	ND	ND	ND	ND	ND
SB-5	**Discrete**	2'	ND	ND	ND	ND	ND	ND	ND
Laboratory Reporting Limit (RL):			20	10	0.0050	0.0050	0.0050	0.010	0.0050
Environmental Screening Levels [1] **Screening Levels Residential / Industrial**			**83 / 83**	**500 / 2,500**	**0.044 / 0.044**	**2.9 / 2.9**	**2.9 /3.3**	**2.3 / 2.3**	**0.023 / 0.023**

Notes

1 = Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entiled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted. The ESLs used for this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water. The ESL document catogorizes TPH as either gasoline, middle distillates, or residual fuels. "Middle distillates" are considered to include diesel fuel, kerosene, stoddard solvent, heating fuel, and jet fuel, whereas "residual fuels" include fuel oil (bunker fuel), lubricating oils (motor oil, oil and grease, waste oils) and asphalts.

ND = Not Detected at or above the laboratory RL.

BOLD = Analytical results above ESL or CA Low-Threat Closure Soil Screening Level

Table 3: Soil Surface Sample Results, July 12, 2013
Lead and Asbestos Analysis
14905 Santa Teresa Boulevard, Fremont, California

All soil results are in parts per million (mg/kg).

Sample Information			Lead (by EPA Method 6010B)	Asbestos* (by EPA Method 600/R-93/116)
Sample ID#	Sample Type	Depth (inches below ground surface)		
LA-1	**Surface Grab Sample**	3"	**150**	None Detected
LA-2	**Surface Grab Sample**	3"	31	None Detected
LA-3	**Surface Grab Sample**	3"	**86**	None Detected
LA-4	**Surface Grab Sample**	3"	56	None Detected
LA-5	**Surface Grab Sample**	3"	37	None Detected
LA-6	**Surface Grab Sample**	3"	**85**	None Detected
LA-7	**Surface Grab Sample**	3"	56	None Detected
LA-8	**Surface Grab Sample**	3"	13	None Detected
Laboratory Reporting Limit (RL):			20	--
Environmental Screening Levels [1] Screening Levels Residential / Industrial for SHALLOW Soils (<3m)			**80 / 320**	--
CHHSLs [2] Screening Levels Residential / Industrial			**80 / 3,500**	--

Notes

1 = Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entiled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted. The ESLs used for this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water. The ESL document catogorizes TPH as either gasoline, middle distillates, or residual fuels. "Middle distillates" are considered to include diesel fuel, kerosene, stoddard solvent, heating fuel, and jet fuel, whereas "residual fuels" include fuel oil (bunker fuel), lubricating oils (motor oil, oil and grease, waste oils) and asphalts.

2 = California Human Health Screening Levels for Soil (CHHSLs): The California Human Health Screening Levels are concentrations of 54 Hazardous Chemicals in soil or soil gas that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

ND = Not Detected at or above the laboratory RL.

< # = Reporting limit elevated due to laboratory sample dilution. Value reported as less than elevated laboratory reporting limit, X.

BOLD = Analytical results above CHHSL or ESL

* = EPA Method 600/R-93/116 is a qualitative detection method

Table 4: Summary of Soil Vapor Sample Analytical Results - July 12, 2013
Morgan Hill Ag ESA Phase II
14905 Santa Teresa Blvd, Morgan Hill

All results are in ug/m³

Sample ID	Sample Depth (feet, bgs)	Toxic Organics (TO - 3) in Air	Toxic Organics (TO - 15) in Air								Leak Trace Compound Monitoring		
		Total Petroleum Hydrocarbons as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes		MTBE	TBA	Other VOCs	Average Shroud Concentration as % (Field Measurement)	Summa Canister Helium as % (Laboratory Results)	% Sample Leakage
						m,p	o						
SV-1	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.5	0.20	0.9
SV-2	5'	550*	4.64	ND	4.90	ND	ND	ND	ND	ND	22.8	1.20	5.3
SV-3	5'	160*	ND	ND	ND	ND	ND	ND	ND	ND	24.7	0.95	3.8
SV-4	5'	220*	3.22	2.21	5.43	ND	ND	ND	ND	ND	28.4	2.40	8.5
Laboratory Reporting Limit (RL):		57	1.6	1.9	2.2	4.3	2.2	1.8	8.4	varies	--	--	--
CHHSLs (1) Screening Levels Residential / Commercial		--	36.2 / 122	135,000 / 378,000	--	315,000/ 879,000		4,000 / 13,400	--	varies	--	--	--
Environmental Screening Levels Residential & Commercial (ESLs) (2)		370,000 / 3,100,000	42 / 420	160,000 / 1,300,000	490 / 4,900	52,000 / 440,000		4,700 / 47,000	--	varies	--	--	--

Notes:

1 = California Human Health Screening Levels for Indoor air and soil gas (CHHSLs): The California Human Health Screening Levels are concentrations of 54 Hazardous Chemicals in soil or soil gas that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

2 = Environmental Screening Levels (ESLs): from Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final, November 2007 - revised February 2013), California Regional Water Quality Control Board - San Francisco Bay Region. The ESLs are intended to provide guidance on whether remediation of detected contamination is warranted. The ESLs used for this table were obtained from Table E., Indoor Air and Soil Gas (Vapor Intrusion Concerns) Screening Levels.

Residential / Commercial = **LTSGC, CHHSLs & ESLs for Residential or Commercial land uses**: ESL screening limit concentrations are presented in **BROWN** for Residential land uses and in **GREEN** for Commercial/Industrial land uses. A single number indicates the ESL is the same concentration for both Residential and Commercial land uses.

VOCs = Volatile Organic Compounds **ug/m³ =** micrograms per cubic meter (parts per billion, ppb)

bgs = below ground surface

MTBE = Methyl Tert Butyl Ether **TBA =** Tert Butanol

< # = Analyte not-detected at or above the elevated laboratory reporting limit. Reporting limit elevated due to laboratory sample dilution; results presnted as less than the Method Detection Limit (MDL)

J = Laboratory reports the result is a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather than quantitative.

* = Does not match pattern of reference Gasoline standard. Hydrocarbons in the range of C5-C12 quantified as Gasoline.

Table 5: Grab Groundwater Results, July 12, 2013
Total Petroleum Hydrocarbons and Volatile Organic Analysis

14905 Santa Teresa Boulevard, Morgan Hill, California

All grab groundwater results are in ug/L

Sample Information			Total Petroleum Hydrocarbons		Volatile Organic Analysis by EPA #8260				
Sample ID#	Depth to Groundwater* (feet)	Temporary Screen Interval	Diesel (by EPA #8015B)	Gasoline (by Luft/GC/MS)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
DP-1	15.4'	22-32'	ND	ND	ND	ND	ND	ND	ND
DP-2	12.3'	15-25'	ND	ND	0.17 J	0.15 J	ND	ND	ND
DP-3**	12.3'	14-18'	ND	ND	ND	ND	ND	ND	ND
DP-4**	16.6'	14-18'	ND	ND	ND	ND	ND	ND	ND
Laboratory Reporting Limit (RL):			**40**	**50**	**0.50**	**0.50**	**0.50**	**1.0**	**0.50**
Central Coast Region Water Quality Goals (WQG)[1]:			**1,000**	**1,000**	**1**	**150**	**300**	**1,750**	**5**

Notes

1 = Water Quality Goals: Goals estabilised by the CRWQCB Central Coast Region based on Maximum Contaminant Limits (Department of Health Services) or taste & odor threshold limits.

ND = Not Detected at or above the laboratory RL.

< # = Reporting limit elevated due to laboratory sample dilution. Value reported as less than elevated laboratory reporting limit, X.

J = Indicates a value between the MDL and PQL and that the reported concentration should be considered as estimated rather than quantitative.

BOLD = Analytical results above ESL or CA Low-Threat Closure Soil Screening Level

* = Not necessarily stabilized Depth to Groundwater

** = Total boring depth for DP-3 and DP-4 was to 24' and 32' bgs, respectively

APPENDIX A

COLLECTED *PHASE I ESA* INFORMATION

- Site Inspection Checklist with Photo Sheet
- Land Use Questionnaire
- Interviewing Documentation

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

Phase I Environmental Site Assessment
Site Inspection Checklist

Objective: **To visually evaluate and document the extent of the target property(ies) for the likely presence of *recognized environmental conditions.***

Site/Facility Name: Former Ruth Jones Property / Christmas Tree Farm

Site Address: 14905 Santa Teresa Blvd, Morgan Hill [779-02-023]

Site Contact: Doug Blackwell, (408) 892-8345

1. Current Uses of the Property: *To include (1) general description of the facility & commercial or industrial processes therein, (2) topography, (3) site improvements [# of buildings, size/age/condition], (4) occupants/vacancies and the nature of business operations, and (5) any indications of past site use.*

The Site is an approximately 18-acre agricultural property, with a dilapidated barn, one house and an adjoining garage present. The remainder of the Site is sporadic and at times densely vegetated, with patches of the former christmas trees and orchards, along with invading plant species. Site topography is generally flat, however a large, inclined man-made hill is present in the northwestern portion of the property, possibly used to elevate farm equipment and materials above flood level.

The one-story, wooden barn structure was built prior to 1917 (present in topographic maps) in conjunction with agricultural activities at the site. The barn is currently unused, and is in disrepair with refuse throughout. There is no evidence of current chemical storage within the barn area. There are some tools and agricultural equipment remnants of the Christmas tree farm operations which were conducted on the Site by previous owners.

The residence and associated garage were built some time in the early 1960s (aerial photographs). The house and garage are in good condition and are well maintained. There is no evidence of chemical storage associated with these structures, aside from basic household fuel and chemical storage for automotive and property maintenance.

2. Site Infrastructure:

	Yes	No
• Any wells, water tanks or water towers?	☑	☐
• Bioler rooms?	☐	☑
• Electrical transformers?	☐	☑
• Septic System?	☐	☐
• Drainage wells or dry wells?	☐	☑

Notes:

Note observations and data for heating sources, water supply source(s), solid waste disposal and electrical systems.

A single water supply well is present on-Site that was installed in the late 1990s. This well replaced a pre-existing well that was used for agricultural purposes. The current well produces potable water for the single-family residence.

3. Evidence of Hazardous Materials Storage & Use *(check appropriate):*

	Yes	No
• Haz-mat storage area(s)? Location?	☐	☑
• Abandoned drums or containers?	☑	☐
• Aboveground Storage Tanks?	☐	☑
• Underground Storage Tanks?	☐	☑
• Fuel or Chemical Dispensing Equipment or vent piping?	☐	☑
• Pools of liquid? Characteristics?	☐	☑
• Sumps, oil/water separators and collection pits?	☐	☑
• Unusual Odors, staining or distressed vegetation?	☐	☑

The former UST and AST were removed from the Site in 1997. Only small quantities of fuels and chemicals are present in the garage adjoining the residential dwelling.

HAZMAT CONTINUED:

4. Exterior Observations:

	Yes	No
• Exterior surface coverings? *(describe condition, type, % native soils)*	❑	☑
• Paving patches/staining?	❑	☑
• Manholes/utility covers?	❑	☑
• Any stacks or HVAC units visible on roof?	❑	☑
• Mounds or depressions?	☑	❑
• Do surface water catch basins drain?	❑	❑
• Any ditches or drainages? *(If flow is present, identify the source)*	☑	❑

A large, inclined man-made hill is present in the northwestern portion of the property, possibly used to elevate farm equipment and materials above flood level. Llagas Creek (Coyote Creek) runs along the southeastern border of the property, flowing east-northeast.

5. Interior Observations:

	Yes	No
• Maintenance Areas	❑	☑
• Hydraulic Equipment	❑	☑
• Interior Floor Staining or Patching?	❑	☑
• Interior Floor Drains? Outlet Sump?	❑	☑
• Interior Floor Integrity (good, satisfactory, poor)?	❑	❑

The interior of the barn had a large quantity of refuse and pieces of the structure. No drains were observed. The barn's floor are wooden.

6. Describe Adjoining Site Land Uses and Note Any Areas of Concern:

Northeast (down-gradient lands): Santa Teresa Blvd and residential neighborhoods.
Northwest (side-gradient lands): Watsonville Road, low density residences.
Southwest (up-gradient lands): Low density residential.
Southeast (side-gradient lands): Coyote Creek (Llagas Creek) and open space.

7. Any inaccessible Areas of the Property:

No

ADDITIONAL INFORMATION OBTAINED & UTILIZED DURING SITE INSPECTION

	Yes	No
Photo Sheets	☑	☐
Hazardous Materials Management Plans (HMMP)	☐	☑
Permits	☐	☑
Previous Reports/Inspections	☑	☐
Other	☐	☑

Project #: 2X330 - Morgan Hill Ag ESA
Date: 07/09/2013 @ 12:00 PM
Inspector: Jacob Aman

001. Inside barn

002. Inside barn

003. Inside barn

004. Side of barn

005. Catch basin near side of barn

006. Inside barn

007. Inside barn

008. Facing north from eastern portion of site

009. Domestic water supply well and tank

010. Driveway - facing southwest

011. Driveway entrance

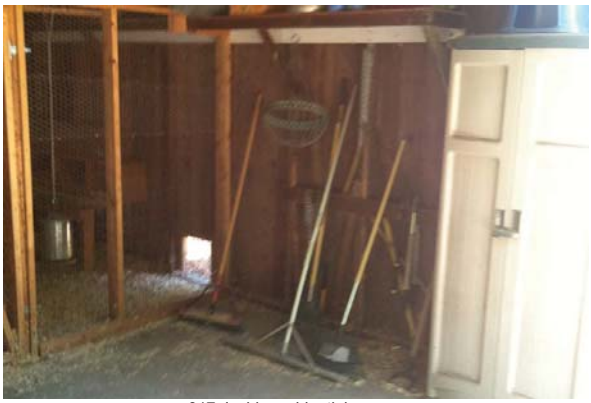
012. Hoist next to trailer

013. Mature orchards, Christmas trees

014. Farm equipment - disk

015. Tractor next to residential unit

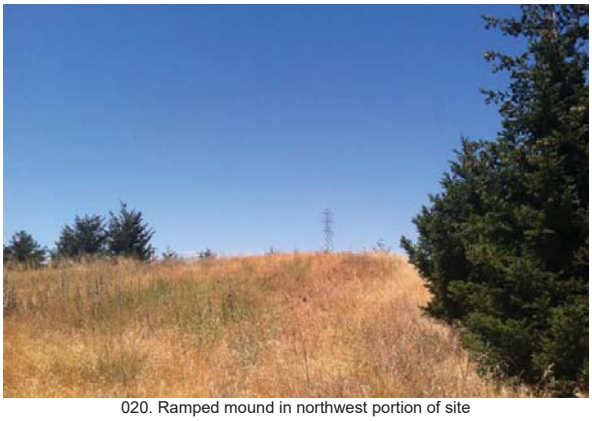
016. Inside residential garage



017. Inside residential garage

018. Old irrigation piping next to garage

019. Piles of tree cuttings throughout



020. Ramped mound in northwest portion of site

021. Christmas trees and central access road

022. Facing southwest along Watsonville Road

023. Facing northeast along Watsonville Road

024. Upgradient property across Watsonville Road

025. Vineyard across Watsonville Road

026. Intersection of Watsonville Road and Santa Teresa Blvd

APPENDIX B

HISTORICAL RESEARCH REPORTS
(EDR)

- **City Directory Listings**
- **Aerial Maps**
- **Sanborn Maps** *(no coverage available)*
- **Historical Topo Maps**

APPENDIX D

- **Local Agency Documentation & Previous Environmental Investigation Summaries for the Subject Site and Adjoining Properties**

Appendix G

Phase I Environmental Site Assessment

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

PHASE I/II ENVIRONMENTAL SITE ASSESSMENT
for an Agricultural Property

14905 Santa Teresa Boulevard
Morgan Hill, California

September 10, 2013
Project: 2X330

Prepared for:
Mr. Doug Blackwell
Jack R. Blackwell Inc.
PO Box 817
Campbell, CA 95009

Above: **Tree Farm within Subject Property**
Santa Clara County Assessor Parcel Number:
779-02-023

Protecting California's Groundwater Resources Since 1988.

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TABLE 2: Soil Sample Analytical Results – Petroleum Hydrocarbons and VOCs
TABLE 3: Surface Soil Sample Analytical Results – Lead and Asbestos
TABLE 4: Soil Vapor Sample Analytical Results
TABLE 5: Groundwater Sample Analytical Results

APPENDICES

APPENDIX A: Site Inspection Checklist, Property Land Use Questionnaire, Photo Sheets, Interview Documentation

APPENDIX B: Historical Research Reports
- City Directory Report
- Aerial Photos
- Sanborn Maps *(no coverage available)*
- Historical Topo Maps

APPENDIX C: EDR Radius Report (database review of regulated sites)

APPENDIX D: Related Reports, Closure Letters and Regulatory Correspondence

APPENDIX E: Phase II Sampling and Reporting Documentation
- Boring Logs, Field notes and photo documentation, *Field Methodology for Hydraulic Driven Probes, Field Methodology for Active Soil Gas Sampling*
- State-certified Laboratory Results and Chain-of-custody Documentation

ABBREVIATIONS AND ACRONYMS

APN	Assessor's Parcel Number
AST	Aboveground Storage Tank
ASTM	American Society for Testing & Materials
bgs	Below Ground Surface
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CHHSL	California Human Health Screening Levels
CHMRS	California Hazardous Material Incident Report System
COMP	Composite Sample (4 each)
DP	Driven Probe Location
EDR	Environmental Data Resources
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
LUST	Leaking Underground Storage Tank
mg/Kg	Milligrams per kilogram
ppm	Parts Per Million
OCP	Organochlorine Pesticide
ppb	Parts Per Billion
SB	Soil Boring Location (shallow)
SBC-EHS	San Benito County Environmental Health Services
SLIC	Spills, Leaks, Investigation & clean-up
TPH	Total Petroleum Hydrocarbons
µg/L	Micrograms per Liter
USGS	United States Geological Society
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

PHASE I ESA FINDINGS SUMMARY

14905 Santa Teresa Boulevard, Morgan Hill

	Phase I ESA Results (section #)		NFA	HREC	REC	Details & Comments
Historical Review	4.1	City Telephone Directories	X			No evidence of on-site or vicinity business operations of concern were noted during our review.
	4.2	Historic Land Use Maps	X			No coverage was available.
	4.3	Aerial Photographs	X		X	Historical aerial photographs taken between 1939–2012 shows that the subject Site has remained an agricultural property for 70+ years. Surrounding land-use was historically agricultural, with increasing residential development from the 1980s onward. **The potential presence of persistent pesticide residues is considered a *Recognized Environmental Condition* (REC) for long-term agricultural properties transitioning to residential.** Note: ***Phase II soil testing addressed this REC***
	4.4	Topographic Maps	X			There is no evidence from these topographic maps of significant geophysical or hydrological changes at the Site or surrounding area that could negatively impact soil or groundwater at the Site.
Regulatory Review	5.1	Federal, State and Regional Environmental Records (source: EDR Database)	X	X		A fuel release was discovered at the subject Site during tank removal operations for a 1,000 gallon gasoline UST and 500 gallon gasoline AST. The release was investigated and remedied in the late 1990s and officially granted closure in a letter dated January 9, 2001. Confirmation sampling results completed as part of our Phase II investigation yielded either non-detectable to trace detections of petroleum hydrocarbons in soil, soil vapor and groundwater. **This is considered a *historical recognized environmental condition (HREC).*** Note: ***Phase II soil & groundwater testing addressed this HREC***
	5.2	Vapor Encroachment Conditions Screen	X			No fuel releases or land-use conditions on the subject Site or surrounding properties were found to pose the risk of vapor encroachment on the subject Site. Soil vapor samples collected in the vicinity of the former fuel release at the subject Site had some low-level detections, but were all well below regulatory thresholds for residential land-use.
	5.3	Geotracker / Envirostor Databases	X			Our review of the State of California Geotracker database did not yield any additional business operations or environmental conditions of concern for the subject Site or stemming from surrounding properties.
	5.4	Local Agency File Review	X			Our review of **Santa Clara County's environmental health records** database did not yield any additional business operations or environmental conditions of concern for the subject Site or stemming from surrounding properties.
Site Recon	6.1	Site Inspection	X			No indications of change in commercial operations at the subject Site since the last ESA in 2003. The tree farm and orchards are no longer maintained, and generally speaking the equipment, barn facility and external premises showed that no commercial operations have continued at the Site.
	7.1	User Questionnaire / Interviews	X			Our review of the User Questionnaire and interviews from County and State regulatory staff did not reveal any additional environmental concerns for the subject Site.

Explanation of Environmental Assessment Terminology

adapted from ASTM Standard E 1527-05

'REC' - Recognized Environmental Condition: The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

'HREC' - Historical Recognized Environmental Condition: An environmental condition which in the past would have been considered a recognized environmental condition, but which may or may not be considered a recognized environmental condition currently.

'NFA' - No Further Action, *De minimis* Condition: Conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.-

PHASE II ESA FINDINGS SUMMARY

(Soil, Soil Vapor, & Groundwater Sampling)

14905 Santa Teresa Boulevard, Morgan Hill

		Phase II ESA (Soil, Soil Vapor and Groundwater Results)	Conclusions & Recommendations
Phase II Findings	Section 8.2	**Soil Sampling Results:** Three of the composite samples analyzed for persistent organochlorine pesticides (OCPs) yielded detections of dieldrin above the residential ESL. In addition, three of the surface soil samples collected around site buildings yielded slightly elevated detections of lead (likely present due to historical lead-based paint applications).	**Dieldrin Detections**: All soil sampling results contained some limited detections of this persistent pesticide compound but the concentrations were all below the screening limits for residential health and safety concerns (i.e., CHHSL guidelines). However, some of these trace detections exceeded the leachability threshold established in the Water Board's *Environmental Screening Limit* (ESLs, see note below) In consultation with lead Water Board staff, laboratory reanalysis was completed on soil from the quadrant having the highest total dieldrin concentrations. This sample was re-analyzed to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis confirmed the site-specific leachable concentrations were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site. **Total Lead Detections**: Some elevated Total Lead concentrations were detected from 3 areas around the perimeter foundations. Some limited soil scraping will need to be completed (during, or prior to property development) to remove of a limited volume of shallow soil (the source of elevated Total Lead concentrations appears to be from lead-based paint scrapings).
		Groundwater Sampling Results: Groundwater encountered at depths ranging from 12.3 to 16.6 feet below ground surface (bgs) from four hydraulic driven probe borings. Groundwater samples analyzed for non-detect for petroleum hydrocarbons.	Groundwater test results confirmed there are no significant impacts from the historic fuel release at the site. *No further action is required.*
		Soil Vapor Sampling Results: All four soil vapor samples were either non-detectable or well below regulatory thresholds for the contaminants analyzed.	Soil vapor test results confirmed there are no vapor intrusion risks resulting from the historic fuel release at the site. *No further action is required.*

California Human Health Screening Levels for Soil (CHHSLs): The CHHSLs are health-based guideline concentrations established for 54 common Hazardous Chemicals of Concern found in in soil or soil gas. The California Environmental Protection Agency (Cal/EPA) considers detection at or below these established threshold concentrations pose insignificant risk to human health and safety. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has developed these screening limits in a guideline document ***("Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater"***, Interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted based on conservative risk and leachability model inputs. The ESLs referenced here were obtained from the *Table A. Shallow Soils (<3m) where groundwater IS a current or potential Source of Drinking Water*.

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

1.0 EXECUTIVE SUMMARY

This report contains results of a *Phase I Environmental Site Assessment* (ESA) and Phase II confirmation soil & groundwater investigation, which has been conducted to review and assess potential environmental risks at a vacated agricultural property located at 14905 Santa Teresa Boulevard in Morgan Hill, California (the "Site", see Figure 1, Location Map). The Phase I research investigation was completed to identify *potential* environmental risks associated with the property and the Phase II soil and groundwater sampling program was concurrently conducted to assess potential impacts from a historical fuel release and/or historical agricultural land-use (i.e., potential residual impacts from persistent organochlorine pesticides, OCPs).

This agricultural property spans approximately 18 acres, and has been used for agricultural purposes dating back to at least 1939 (the earliest available aerial photograph). Site topography is relatively flat-lying, with elevations that range from approximately 340 to 350 feet above mean sea level (MSL). The property is bounded to the southeast by the northeasterly flowing Llagas Creek. The surrounding land-use is a combination of agricultural and residential, with increasing residential development to the north along Santa Teresa Boulevard since the 1980s (see Figure 2 – Vicinity Map). First encountered groundwater beneath the property is fairly shallow, at depths generally ranging from 10 to 15 feet below ground surface (bgs).

1.1 Summary of Phase I Research

Phase I ESAs provide limited assurances of risk, since they rely on current Site conditions (Site inspections), cooperative and candid interviews/questionnaires, and a limited database of regulatory and historical documentation. The Site inspections, interviews, and review of regulatory and historic documents are designed to identify <u>potential</u> environmental liabilities of concern. These potential liabilities have been defined by the *American Society for Testing and Materials (ASTM)* into the following categories: (1) ***recognized environmental conditions***, (2) ***historical recognized environmental conditions*** and (3) ***de minimis conditions*** (definitions presented on Project Findings Summary, pg. iv).

- <u>Historical Review</u>: **Historical aerial photographs document that the Site has remained in agricultural use since at least 1939. Persistent pesticide residues are considered a <u>potential</u> REC, particularly with a land use change to residential. No other *recognized environmental conditions*** were identified for the subject property or from surrounding properties from the review of historical documents, which included aerial photos, land use maps, reverse telephone directories and topographic maps.
- <u>Regulatory Review</u>: Our review of available agency records that document chemical storage, waste handling, and/or chemical releases indicate there are <u>currently</u> **no on-site or surrounding *recognized environmental conditions*** having the potential to negatively impact the subject Site.

1. Closed Fuel Release Case (LUST): Our review did note that a historical leaking underground storage tank (LUST) occurred at the site, subsequent investigation and monitoring indicated the release was minor and attenuating. The overseeing agency **issued a "no further action" closure letter in 2001 following 4 years of groundwater** monitoring. Currently, Phase II confirmation soil, soil vapor and groundwater sampling was conducted in the vicinity of this release which confirmed no significant impacts are present (findings are detailed in Section 1.2 below). The presence of this closed fuel release case **is considered a *historical recognized environmental condition* (HREC).**

2. Closed Upgradient / Sidegradient Fuel Release Case (LUST): Former Rist Quarry: We reviewed of the case history for a historical fuel release at 14905 Watsonville Road, which is located on adjoining property to the west of the Site perimeter (see Figure 4). A summary of the case history is presented in Appendix D. The presence of this closed fuel release **is considered a *de minimis environmental condition*.**

- Inspection/Land-Use Questionnaire: The visual inspection of the Site, the review of a *User Questionnaire* and our site interviews did not **reveal any *recognized environmental conditions*** at the subject Site.

1.2 Summary of Phase II Limited Soil and Groundwater Assessment

A *Limited Phase II Soil, Soil Vapor & Groundwater investigation* was completed in order to assess: 1) whether any remaining elevated petroleum hydrocarbons from the former underground storage tank release persist, and 2) whether residual pesticide contamination is present as a result from historical applications of agricultural chemicals within orchards and agricultural fields at the property.

The Phase II sampling program revealed the following:

- Sampling results targeting the former fuel release: No further action will be required. Groundwater, soil and soil vapor samples analyzed for petroleum hydrocarbons around the former fuel release yielded only a few trace detections of diesel and constituent volatile organic compounds (VOCs).

- Sampling results targeting lead-based paint and asbestos around Site infrastructure: Some limited soil scraping from 3 areas around the perimeter foundations will need to be completed (during, or prior to property development) to remove a limited volume of soil apparently impacted by lead-based paint scrapings. No detections of asbestos were found in the soil samples (Lead results are presented on Figure 7 and Table 3).

- Sampling results targeting transition from agricultural land use to residential land use: All soil sampling results contained some limited detections of this persistent pesticide compound but the concentrations were all below the screening limits for residential health and safety concerns (i.e., CHHSL guidelines, results of shallow soil testing is shown on Figure 5 and Table 1). However, some of these trace detections exceeded the leachability threshold established in the Water Board's *Environmental Screening Limits* (ie., ESL guidelines). In consultation with lead

Water Board staff, laboratory reanalysis was completed on soil collected from the Site quadrant having the highest total dieldrin concentrations. This soil sample was re-analyzed to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis confirmed the site-specific leachable concentrations were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site.

1.3 Executive Summary: Conclusions and Recommendations

We have performed a *Phase I Environmental Site Assessment* in accordance with the scope and limitations of *ASTM Practice E 1527* for a property located at 14905 Santa Teresa Boulevard in Morgan Hill. There were no exceptions to, or deletions from, this practice (i.e. data gaps), as described in Section 8.0 of this report.

This assessment did not reveal evidence of ***recognized environmental conditions*** at the subject property. However, to provide conservative assurances for land use transition from agricultural to residential, a Phase II sampling program was conducted.

Based on these results, we conclude there are no environmental impediments for residential land use.

This concludes the *Executive Summary*.

2.0 PURPOSE AND SCOPE

This report contains results of a *Phase I Environmental Site Assessment* (ESA) that has been conducted to review environmental liabilities resulting from historic or existing environmental risks for the subject properties. Completed work tasks conformed to the recommended guidelines established by the American Society for Testing and Materials (ASTM). *Limitations and Exceptions of Assessment* are listed at the end of this report.

The purpose of this ESA is to provide a professional opinion regarding *recognized environmental conditions* at the Site, including potential impacts from known environmental problems in the surrounding area. The term "*recognized environmental conditions*", is defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property" (ASTM Standard E 1527).

2.1 Defined Scope and Methodology

The scope of services completed for this Phase I/II ESA, included the following tasks:

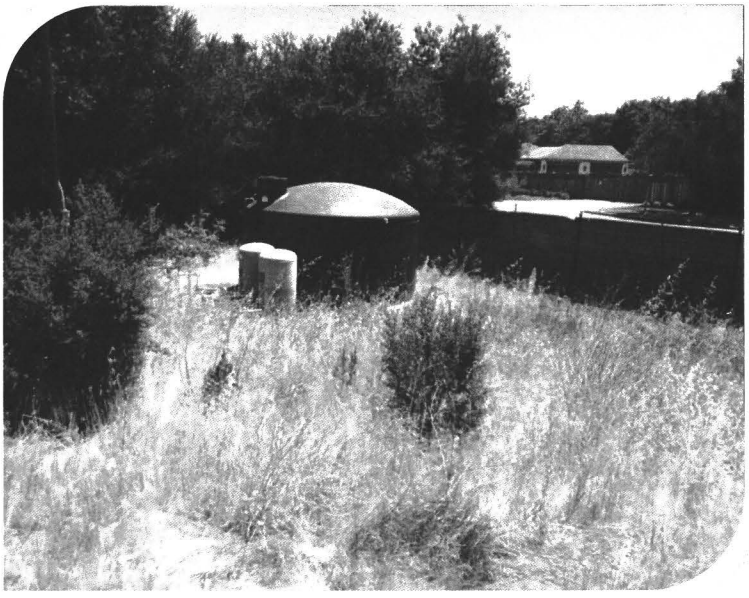
- We reviewed historical maps, and aerial photographs, available geologic, topographic and groundwater data of the Site and vicinity (Section 4 of this report).

- We completed a visual inspection of the Site, to check for indicators that might suggest a potential source of contamination such as current hazardous materials storage or use, unusually stained ground surfaces (soils, slabs), stressed vegetation, sumps/drains/tanks, and discarded hazardous material containers (Section 6 of this report). A copy of our Site Inspection Checklist, which includes Site photos, is included in Appendix A.
- We reviewed a Property Land-Use Questionnaire completed by a person knowledgeable of current/historical land-uses (Section 7 of this report).
- We reviewed available records of hazardous material storage and releases documented in databases or file reviews at State and Local regulatory agencies such as the California State GeoTracker® and the Santa Cruz County Department of Environmental Health for the subject Site and sites within a quarter mile radius of the subject Site (see Section 5 of this report and Appendix C for a copy of pertinent documents).
- We contracted with EDR, an information research firm specializing in environmental data collection, to conduct a regulatory list search of sites with underground fuel storage tanks (UST's), contaminated sites, hazardous waste generation or treatment-storage-and disposal facilities, and landfills located within ASTM survey radius. We evaluated the locations of all identified sites relative to the Site (see Appendix C for a copy of EDR's radius report).
- Based on recognized environmental conditions identified as part of the Phase I ESA research, we completed a Phase II soil and groundwater sampling and testing program to assess potential environmental liability associated with the historical land uses and nearby release sites. The details are presented in Section 8 of this report.
- We evaluated the collected information and prepared this summary report.

3.0 SITE DESCRIPTION

3.1 Location Setting

The subject Site is a vacated, approximately 18-acre agricultural property, containing several structures including a dilapidated barn, one house and an adjoining garage (Figure 3). An older residential dwelling was reportedly demolished in the 1990s. The remainder of the property is sporadically and in places densely



***Above**: Domestic water supply well installed at the Site in 1998.*

vegetated, with patches of Christmas trees and orchards previously managed at the Site (see photos, Appendix A).

The one-story, wooden barn structure was built prior to 1917 (visible in topographic maps) apparently in conjunction with agricultural activities at the site. The barn is currently unused, and is in disrepair with refuse throughout. There is no evidence of current chemical storage within the barn or its vicinity. There are some tools and agricultural equipment, apparent remnants of the Christmas tree farm operations conducted on the Site by previous owners.

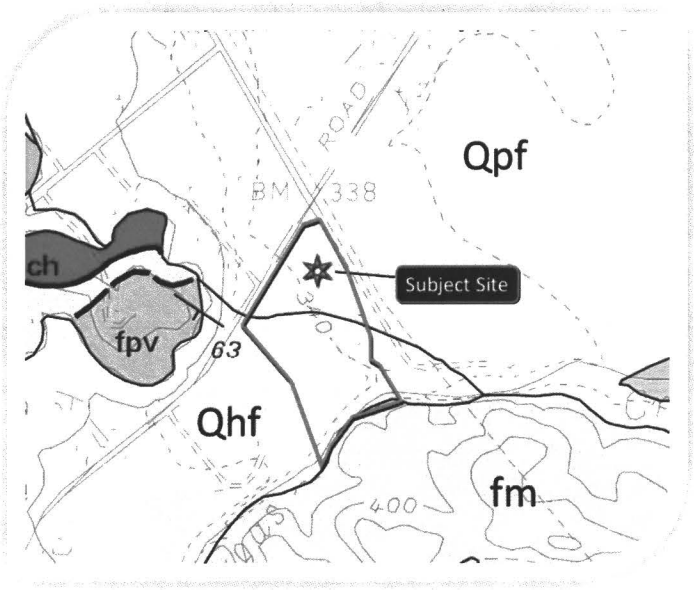
Aerial photographs indicate the residence and associated garage were built sometime in the early 1960s. The house and garage are in good condition and are well maintained. There is no evidence of significant hazardous materials or petroleum products storage associated with these structures, aside from small quantity household fuel and chemical storage for automotive and property maintenance.

Site topography is generally flat, ranging from 340 to 350 feet above mean sea level (MSL). In the northwest portion of the property, a large man-made inclined mound is present.

The surrounding land-use is a combination of residential and agricultural, with increasing residential development to the east and north of the subject Site since the 1980s (*see Figure 2 – Vicinity Map*).

3.2 Local Hydrogeologic Setting

The subject Site lies in the southern portion of Santa Clara Valley at an elevation of approximately 340 feet above Mean Sea Level (Figure 1), on the eastern flank of the Santa Cruz Mountains. The geologic structure of the area is controlled by northwest/southeast trending faults with mountains and valleys with the same orientation. The Santa Clara Valley is bounded by the Santa Cruz Mountains to the southwest and the Diablo Mountain Range to the northeast. The general vicinity is underlain by alluvial fan deposits over inter-bedded shale and sandstone bedrock. Unconsolidated surface soils are typically coarse grained alluvial fan sediments which include fine to coarse grained gravel and sand, with some silt and clay present. These alluvial fan deposits are inter-bedded with finer gravel, sand, silt, and clay stream deposits as they progress towards the center of the valley.



Regional Geologic Map
Qhf = alluvial fan deposits, *Qpf* = older, dissected alluvial deposits, *fm* = Melange of the Central belt

Groundwater in the vicinity of the subject site is unconfined, and flows generally to the east to northeast towards Llagas Creek. The depth to groundwater in the vicinity of the Site has been documented to be approximately 10-15 feet below ground surface.

4.0 HISTORICAL REVIEW

Historic maps, telephone directories, and aerial photographs can be a valuable resource for determining obvious past uses of the property. These records can provide evidence of notable land use changes to the property and potential clues of hazardous material storage (copies of historic maps and aerials are included in Appendix B). Land use observations of these historical records are summarized below.

4.1 City Telephone Directories

Historical research of reverse City Telephone Directories for nearby and adjacent properties generally indicate that most of the occupants of adjacent and nearby properties were residential (or residential associated with agricultural land-use).

On-Site Land Uses: The City Telephone Directory lists a private residency and an agricultural Christmas tree farm operation as the occupants of the subject Site between 1975-2011. The following table lists the historical residents for *14905 Santa Teresa Blvd.*

Target Property Occupants/Businesses		
Site Address	**Year**	**Occupants**
14905 Santa Teresa Blvd	*2011*	*No Return*
	2000	Residential
	1996	Residential
	1991	Llagas Creek Christmas Trees, Residential
	1986	Llagas Creek Christmas Trees , Residential
	1980	Llagas Creek Christmas Trees , Residential
	1975	Llagas Creek Christmas Trees , Residential

Vicinity Land Uses: The following table summarizes the historical listings for adjacent and surrounding properties. *There do not appear to be any potential sites of concern that are both hydrogeologically upgradient and close to the subject.*

Neighboring Property Occupants/Businesses		
Site Address	**Year**	**Occupants**
14830 Branston Ct (adjacent parcel to the south, *upgradient*)	2011 2005 2000	Residential Residential Residential

Neighboring Property Occupants/Businesses		
Site Address	**Year**	**Occupants**
14840 Branston Ct (adjacent parcel to the southwest, *upgradient*)	2011 2005 1996	Residential Residential Residential
14730 Secretariat Way (adjoining parcel to the east, *sidegradient*)	2011	Residential
14915 Santa Teresa Blvd (nearby parcel, 800 feet east, *sidegradient*)	*2000* *1996* *1991* 1986 *1980* 1975	*No Return* *No Return* *No Return* Residential *No Return* Knope Bros Residential
14815 Santa Teresa Blvd (nearby parcel, 1,000 feet east, *sidegradient*)	*1991* 1986	*No Return* Residential

Our review of the City Telephone Directories did not identify long-term land-uses that would suggest areas of concern for the subject Site or from properties in the Site vicinity.

4.2 Sanborn Fire Insurance Maps

Sanborn Fire Insurance Maps are typically associated with urban land-use and can provide detailed, historical land use information where the insurance company provided coverage. The Sanborn Map database was reviewed and no coverage was available for this rural area (*see Sanborn Coverage Report, Appendix B*).

4.3 Aerial Photographs

Twelve (12) aerial photographs depicting the subject Site and the vicinity were available from 1939 through 2012. Copies of the historical aerials are included in Appendix B. The following table summarizes our observations:

Year	On-Site Photo Observations	Off-Site Photo Observations
1939	The Subject site ("Site") appears to be in agricultural use with orchard rows covering the majority of the property. The property appears to be just a portion of a much larger agricultural property. A group of structures near the eastern corner of the property appear to be domestic residences or agricultural structures. A creek runs along the southeast border of the property.	The surrounding area appears to be agricultural or undeveloped land (possibly for grazing). Orchard rows comprise the majority of the properties surrounding the Site. Santa Teresa Blvd bisects the surrounding area in a southwest-northeast direction.
1956	The Site generally appears as it did in the previous photo. A portion of the property at the southern tip appears to be growing a different type of tree than the rest of the property, likely the beginning of the Christmas tree farming operation.	The surrounding area generally appears as it did in the previous photo. What appear to be large agricultural structures can be seen to the southwest of the subject site.
1968	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo. Additional agricultural structures can be seen on various properties to the north of the subject site.
1974	The orchard rows in the northern portion of the site appear to have been removed.	The surrounding area generally appears as it did in the previous photo. Additional agricultural structures can be seen on various properties to the north of the subject site.
1982	The Site generally appears as it did in the previous photo. Poor photo quality does not allow for detailed observations of the site.	Large sections of former agricultural land have been developed for residential use to the north and west of the subject site. Poor photo quality does not allow for detailed observations of the surrounding area.
1993	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.
1999	The Site generally appears as it did in the previous photo.	Residential development continues to spread from the northeast towards the subject site.

Year	On-Site Photo Observations	Off-Site Photo Observations
2005	The Site generally appears as it did in the previous photo	A road ending in a cul de sac is now seen at the eastern corner of the property. Property lines appear to have been adjusted to account for the roadway.
2006	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.
2009	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo. Residential development continues to spread.
2010	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.
2012	The Site generally appears as it did in the previous photo.	The surrounding area generally appears as it did in the previous photo.

Historical aerial photographs taken between 1939–2012 show that the subject Site has remained an agricultural property. Surrounding land-use was historically agricultural, with increasing residential development from the 1980s onward.

4.4 Topographic Maps

Historical topographic maps, which include the subject property and surrounding sites, were obtained and reviewed (see Appendix B). The topographic maps depict this area of Morgan Hill from 1917 through 1996. There is no evidence from these topographic maps of significant geophysical or hydrological changes at the Site or surrounding area that could negatively impact soil or groundwater at the Site.

4.5 Summary of Historical Review

In summary, no obvious environmental conditions of concern were observed during our historical review for the subject Site or from properties in the Site vicinity. An integrated summary of the accumulated Phase I ESA findings is presented below, in *Section 9.0 – Findings & Opinions*.

Map Findings Summary

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4
STANDARD ENVIRONMENTAL RECORDS				
Federal NPL site list				
NPL	1.000		0	0
Proposed NPL	1.000		0	0
NPL LIENS	TP		NR	NR
Federal Delisted NPL site list				
Delisted NPL	1.000		0	0
Federal CERCLIS list				
CERCLIS	0.500		0	0
FEDERAL FACILITY	0.500		0	0
Federal CERCLIS NFRAP site List				
CERC-NFRAP	0.500		0	0
Federal RCRA CORRACTS facilities list				
CORRACTS	1.000		0	0
Federal RCRA non-CORRACTS TSD facilities list				
RCRA-TSDF	0.500		0	0
Federal RCRA generators list				
RCRA-LQG	0.250		0	0
RCRA-SQG	0.250		0	0
RCRA-CESQG	0.250		0	0
Federal institutional controls / engineering controls registries				
US ENG CONTROLS	0.500		0	0
US INST CONTROL	0.500		0	0
LUCIS	0.500		0	0
Federal ERNS list				
ERNS	TP		NR	NR
State- and tribal - equivalent NPL				
RESPONSE	1.000		0	0
State- and tribal - equivalent CERCLIS				
ENVIROSTOR	1.000		0	0
State and tribal landfill and/or solid waste disposal site lists				
SWF/LF	0.500		0	0
State and tribal leaking storage tank lists				
LUST	0.500		0	0

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4
SLIC	0.500		0	0
INDIAN LUST	0.500		0	0
State and tribal registered storage tank lists				
UST	0.250		0	0
AST	0.250		0	0
INDIAN UST	0.250		0	0
FEMA UST	0.250		0	0
State and tribal voluntary cleanup sites				
VCP	0.500		0	0
INDIAN VCP	0.500		0	0
ADDITIONAL ENVIRONMENTAL RECORDS				
Local Brownfield lists				
US BROWNFIELDS	0.500		0	0
Local Lists of Landfill / Solid Waste Disposal Sites				
ODI	0.500		0	0
DEBRIS REGION 9	0.500		0	0
WMUDS/SWAT	0.500		0	0
SWRCY	0.500		0	0
HAULERS	TP		NR	NR
INDIAN ODI	0.500		0	0
Local Lists of Hazardous waste / Contaminated Sites				
US CDL	TP		NR	NR
HIST Cal-Sites	1.000		0	0
SCH	0.250		0	0
Toxic Pits	1.000		0	0
CDL	TP		NR	NR
US HIST CDL	TP		NR	NR
Local Lists of Registered Storage Tanks				
CA FID UST	0.250		1	1
HIST UST	0.250		1	1
SWEEPS UST	0.250		1	1
Local Land Records				
LIENS 2	TP		NR	NR
LIENS	TP		NR	NR
DEED	0.500		0	0
Records of Emergency Release Reports				
HMIRS	TP		NR	NR
CHMIRS	TP		NR	NR
LDS	TP		NR	NR

5.0 REGULATORY AGENCY INFORMATION

5.1 Database Search of Federal and State Environmental Records

Records of hazardous material storage and releases are required to be kept by regulatory agencies overseeing these environmental conditions. An information research firm specializing in environmental data collection, EDR, prepared a *Radius Map Report* for the Site, dated June 28, 2013 (included in Appendix C). *The Radius Map Report* identifies sites listed in the selected regulatory databases, presents location maps and details on identified sites, provides a description of the Federal and State agency data reviewed, and limitations to the search. The search specifically documents sites having registered underground fuel storage tanks (UST's), hazardous waste generation, hazardous waste treatment-storage-disposal, and subsurface contamination. Search distances are per ASTM's E1527 standard (see Appendix C for a list of all sites and full descriptions of all regulatory databases). The database search identified the following information for the target property and surrounding sites.

Subject property: The subject property ("Target property") ***was identified*** in several regulatory databases as having a record of a fuel release (LUST, HIST CORTESE), a record of formerly maintaining an UST (HIST UST) and as a one-time generator of hazardous waste (HAZNET). No other historical regulatory records were found for the subject Site. Further details are provided in the table below:

Facility Name	Source	Comments
14905 Santa Teresa Boulevard Former Jones Christmas Tree Farm	LUST, CORTESE HAZNET, HIST UST	**CLOSED FUEL RELEASE CASE** **Former Jones Christmas Tree Farm** operated as a Christmas tree farm at the subject Site that managed a 1,000-gasoline UST and a 500-gallon gasoline AST. Both tanks were removed from the property in 1997, after which a release investigation and cleanup was conducted.

Summary of Investigations: In 1997 a subsurface sampling investigation was performed in the vicinity of an AST on the property. This AST had been emptied and was no longer in service at the time of this investigation. Two test pits were excavated for this investigation to look for surficial soil contamination from the operation of the former AST. An area of soil with hydrocarbon odor was encountered in the second test pit excavated for this investigation. This test pit was extended down to shallow groundwater and all obviously contaminated soils were removed (approximately 85 yd^3).

Then, in May 1997 a 1,000-gallon UST was excavated and removed from the Site. Discolored soil and strong hydrocarbon odors were observed beneath the former UST. The UST excavation was enlarged in an attempt to remove the contaminated soils. Approximately 40 yd^3 of contaminated soil was removed from the UST excavation. No additional soil contamination above the water table was identified. Hydrocarbon discoloration was visible below 12 feet, at the groundwater interface.

Gasoline hydrocarbons were detected in the groundwater sample collected from the old water supply well, with concentrations of benzene exceeding the state Drinking Water Standards (see well location depicted on Site Map – Figure 3). The old water supply well was located approximately 80 feet down-gradient from the UST on the property. This well was sealed and abandoned under SCVWD permit, and replaced with a deeper production well in 1998.

The only significant area of contamination identified in this subsurface investigation was the groundwater in the immediate vicinity of the former UST, with no contaminants detected in the groundwater sample collected from the down-gradient well MW-1. As part of this investigation, the domestic water supply system was also sampled. Water samples were collected from the Kitchen Sink at the residence, a Yard faucet, and from the new supply well. The results of water sample analysis revealed residual levels of contamination in the piping leading from the new supply well to the residence.

Quarterly groundwater monitoring at the site was discontinued following SCVWD closure of the fuel leak case at the site. SCVWD closure of the fuel leak investigation at the site was officially granted in a letter dated January 9, 2001. The four groundwater monitoring wells at the site were properly destroyed with SCVWD oversight in March of 2001. Proper destruction of the site groundwater monitoring wells was the final task required by the SCVWD for complete closure of the fuel leak investigation.

Surrounding Sites: Our review of the EDR Radius Report revealed the following for properties within the Site vicinity:

- Chemical/Fuel Release Sites: The records search identified a total of **one (1)** site located within a ¼-mile radius of the Site as having a record of a release of contamination to soil or groundwater [i.e.

Leaking Underground Storage Tanks (LUST), Cortese, Spills Leaks Investigations and Cleanup (SLIC), Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) LUST and Voluntary Cleanup Priority Listing (VCP)]. See *Figure 4 – Surrounding Site Regulatory Review* for a visual representation of current and historical surrounding environmental concerns, and *Appendix C – EDR Radius Report*.

- Hydrogeologically Upgradient Fuel Release Sites: We reviewed the documented surrounding fuel release sites and **identified the following one (1) site** to the north (hydrogeologically upgradient) that is **also within a ⅛**-mile from the subject Site. Upgradient release sites are the most likely nearby sources for subsurface migration of contaminants in groundwater onto the subject Site. The table below provides details on the release case histories and regulatory actions for each site:

Facility Name	Location	Source	Comments
14905 Watsonville Road Former Rist Quarry	550 feet West	LUST	**CLOSED FUEL RELEASE CASE** **Former JR Norton Co.** operated at this adjoining, upgradient property. A 4,000-gallon gasoline and 1,000-gallon diesel UST were removed from the property in 1989, and indications of a release were observed. A fuel release investigation of the aged diesel release; located approximately 550 feet upgradient from the Site boundary to the west was completed. One monitoring well was installed, which did not provide sufficient location/depth data to calculate groundwater flow direction. The release was gauged to be limited and the overseeing agency staff granted site closure.

- Underground Storage Tanks (USTs): The database search of generally historical regulatory records **identified one (1) site** located within a ¼-mile radius having a current or historical record of **permitted UST's (UST, HIST UST, SWEEPS UST,** Cal FID UST and/or Indian UST). *Note: these databases do not accurately indicate whether any active tank(s) are operational at these sites. Duplicate entries are also omitted from this figure.*
- Hazardous Waste: The records search **did not identify any sites** located within a ¼-mile radius as having records showing generation and proper disposal hazardous waste, typically a waste oil or oily waste (RCRA-SQG, RCRA-LQG, RCRA-NonGen, Notify 65, EDR Proprietary Records).
- Dry Cleaners: The records **did not identify any sites** operating as dry cleaners within ¼-mile radius, (Dry Cleaners).
- Orphan Sites: The EDR report lists **twenty (20) unmapped sites (*"orphans"*) obtained from the list of** databases, for which EDR was not able to determine an exact location. However, upon further research, none of these sites appear to be located in the immediate vicinity of the Site and/or do not have a chemical release associated with them.

- Combined Regulatory Review Map: A comprehensive radius map documenting significant nearby releases, hazardous materials and waste management, UST/AST storage and other significant environmental features is presented in *Figure 4 – Surrounding Site Regulatory Review*.

5.2 Vapor Encroachment Conditions (VEC) Review

In accordance with updated standards for assessing vapor encroachment (ASTM E2600-10), we evaluated the Site and its vicinity for vapor encroachment conditions, or conditions that indicate that sources and pathways for harmful volatized chemicals to enter current or future on-site buildings are present at the Site and/or Site vicinity. **We did not identify any sites** within a 1/10-mile radius around the subject Site as having the potential to pose the risk of vapor intrusion on the subject Site.

5.3 Geotracker / EnviroStor File Review

Records of hazardous materials storage and releases can also be found in state regulatory agency databases, such as the California State Water Resources Control Board Geotracker® database and Department of Toxic Substances Control EnviroStor database. A review was conducted for records on the subject Site, neighboring sites and sites revealed in the federal and state environmental database search from Section 5.1.

- Our review of the California State Geotracker database, conducted on July 3, 2013, did not identify any additional site within a ¼-mile radius of the subject Site as having a record of a release of contamination to soil or groundwater (see Figure 4 – 'Surrounding **Site Regulatory Review**').

5.4 *Santa Clara County Department of Environmental Health* File Review

We reviewed *Santa Clara County Department of Environmental Health Department's* public records database to retrieve any documentation of releases or hazardous materials storage pertaining to the subject Site not already identified by other regulatory databases.

5.5 Summary of Regulatory Review

In summary, our review of regulatory databases and reasonably ascertainable documents indicates that there was a single historical fuel release at the subject Site that was closed by the overseeing regulatory agencies in 2001 following assessment drilling & monitoring. We found documentation of an off-site release within a ¼-mile radius of the subject Site at 14905 Watsonville Road (Former Rist Quarry). This adjoining property diesel release received case closure by the overseeing agency following subsurface investigation.

A comprehensive radius map documenting significant nearby releases, hazardous materials and waste management, UST/AST storage and other significant environmental features is presented as *Figure 4 – Surrounding Site Review*. An integrated summary and assessment of the accumulated Phase I ESA findings is presented in *Section 9.0 – Findings & Opinions*.

6.0 SITE INSPECTION

6.1 Overview

A Site inspection was conducted on July 9, 2013, to note potential sources of contamination associated with on-site activities. A copy of the completed *Site Inspection Checklist*, which contains detailed documentation of the Site survey including a photographic record of the inspection, is presented in Appendix A.

Site Visit Observations	
Subject Property Observations:	
Current Use of Property	The Site is an approximately 18-acre agricultural property, with a dilapidated barn, one house and an adjoining garage present. The remainder of the Site contains sporadic and at times dense vegetation, with patches of the former Christmas trees and orchards. Site topography is generally flat, however a large, inclined man-made hill is present in the northwestern portion of the property. The one-story, wooden barn structure was built prior to 1917 (present in topographic maps) in conjunction with agricultural activities at the site. The barn is currently unused, and is in disrepair with refuse throughout. There is no evidence of current chemical storage within the barn area. There are some tools and agricultural equipment remnants of the Christmas tree farm operations which were conducted on the Site by previous owners. The residence and associated garage were built sometime in the early 1960s (aerial photographs). The house and garage are in good condition and are well maintained. There is no evidence of chemical storage associated with these structures, aside from basic household fuel and chemical storage for automotive and property maintenance.
Evidence of Past Uses of Property	Trees from the former orchards and Christmas tree farm were present. These are overgrown and sporadic.
Potable Water Source	A single water supply well is present on-Site that was installed in the late 1990s. This well replaced a pre-existing well that was used for agricultural purposes. The current well produces potable water for the single-family residence.
Interior Drains? Where to?	No applicable
Sewage Disposal Source	On-site septic and drain field
Pools of Liquid / Odors?	None observed
Hydraulic equipment?	None observed

Site Visit Observations	
Storage tanks?	A gasoline Underground Fuel Storage Tank and Aboveground Fuel Storage Tank were removed from the Site in 1997.
Drums or Containers?	See hazardous materials section below.
Exterior Observations:	
Pits, Ponds, Lagoons?	None observed
Stained soil or pavement?	None observed
Waste water discharge?	No waste (process) water generated from on-site operations.
Wells or septic system?	Septic system on-site for existing house. One active domestic well that replaced the former domestic well in 1998. Old water supply well was impacted by the former fuel release with petroleum hydrocarbons.
Sumps?	None observed
Hazardous Materials?	Only small quantities of fuels and chemicals are present in the garage adjoining the residential dwelling.

Site Visit Observations	
Vicinity Observations:	
Topography of property and vicinity	Site topography is generally flat, however a large, inclined man-made hill is present in the northwestern portion of the property, possibly used to elevate farm equipment and materials above flood level.
Current uses of adjoining properties	▪ Northeast (down-gradient lands): Santa Teresa Blvd and residential neighborhoods ▪ Northwest (side-gradient lands): Watsonville Road, low density residences ▪ Southwest (up-gradient lands): Low density residential ▪ Southeast (side-gradient lands): Llagas Creek and open space
Any previous Environmental related reports?	Yes, see *Section 14.0 – References* and excerpts from historical reports in Appendix D. ▪ A prior Phase I ESA was completed in 2003 ▪ Reports pertaining to the historical fuel release (closed in November of 2000)

6.2 Summary of Site Inspection

In summary, the site inspection did not reveal any areas of environmental concern at the subject Site. An integrated summary and assessment of the accumulated Phase I ESA findings is presented in *Section 9.0 – Findings & Opinions*.

7.0 USER QUESTIONNAIRE & INTERVIEWS

7.1 User Questionnaire

A *User Questionnaire* was completed by Doug Blackwell, Blackrock, LLC.

User Questionnaire Summary	
Reason for Performing ESA?	Start of entitlement process
Environmental Leins?	No
Fair Market Value?	Yes, the purchase price reflects the fair market value.
Environmental Reports	Previous environmental assessment and former UST release investigation reports by Weber, Hayes and Associates.

7.2 Interviews

Interviews were conducted with available county environmental regulator(s). A historical site occupant was not available for interviewing. Copies of the documented interviews are available in *Appendix A*.

Interviewee	Date Conducted	Evidence Indicative of Chemical or Fuel Release at the Site?
Lani Lee Senior Hazardous Materials Specialist *Santa Clara County Department of Environmental Health (SCCDEH)*	07/01/13 Email, Phone	Ms. Lee assisted with reviewing records for the subject Site and retrieving well destruction records for the former monitoring wells at the Site. She and other staff personnel confirmed that there were no additional environmental records for the subject Site subsequent to the closure of the fuel release investigation in November of 2000. A follow-up email discussion with Ms. Lee confirmed that the low-level detections of dieldrin in several composite samples collected from shallow soils throughout the Site were not a concern to SCCDEH, however groundwater leachability concerns should be discussed with the CCRWQCB staff.
Thea Tryon Senior Engineering Geologist *Central Coast Regional Water Quality Control Board (CCRWQCB)*	08/13/13 Email	Ms. Tryon was contacted to determine potential Water Board requirements as a result of trace but elevated detections of dieldrin from three of the quadrants sampled for organochlorine pesticides (OCPs) (see section 8 below for details). She advised that one additional soil sample be collected from one of the impacted quadrants, and that the sample be analyzed for dieldrin via the STLC method (which evaluates potential leachability of the trace levels of dieldrin detected at the site).

7.3 Summary of Questionnaire/Interview Review

The questionnaire/interview is intended to identify previous or current land use that might cause potential environmental impacts. No additional areas of environmental concern were discovered during our review of the User Questionnaire, or our interviewing with site regulators.

8.0 PHASE II SOIL, SOIL VAPOR AND GROUNDWATER INVESTIGATION

A *Limited Phase II Soil, Soil Vapor & Groundwater investigation* was completed in order to assess for any remaining elevated petroleum hydrocarbons from the former underground storage tank release as well potential shallow soil contamination from historical applications of agricultural chemicals within orchards and agricultural fields at the property. A summary of site-specific *recognized environmental conditions* and a summary of the former fuel release case history is presented in Section 10.0 – Findings and Opinions and detailed throughout Sections 4 - 7 of this report.

Advancing boring DP-1 downgradient of the former fuel release.

Driven Probe Boring Data			
Boring #	Depth to Groundwater	Temp Screen Interval	Total Depth of Boring
DP-1	15.4'	20-30'	32'
DP-2	12.3'	15-25'	25'
DP-3	12.3'	14-18'	24'
DP-4	16.6'	14-18'	32'

8.1 Field Investigation

Driven-Probe Operations:

Exploratory drilling was completed at the Site on July 12, 2013 using a truck-mounted GeoProbe® hydraulic driven-probe system operated by Environmental Control Associates, of Aptos, CA. A total of 4 driven probe (DP) samples were cored to groundwater and 5 shallow soil borings (SB) were cored strictly for inspection/testing of near surface soils. **In addition, seven (7) composite samples ("comp-") were** obtained from surface soils in the agricultural acreage to check for the presence of persistent pesticides (see Figure 5). Drilling and sampling followed our standard *Field Methodology for Hydraulic Driven Probes*, which is included in Appendix E. Soil boring permits are not required for subsurface investigation work in this portion of Santa Clara County.

Driven Prove Groundwater Sampling: Four borings (DP-1 through DP-4) were advanced to depths ranging from 20 to 32 feet below the ground surface (bgs). The borings were positioned at locations both downgradient and upgradient of the former UST and AST that were removed from the property in 1997. Based on groundwater data from the late 1990s fuel release investigation, we anticipated depth

to groundwater to be between 10 and 25 feet bgs and flow direction to be generally in a northeasterly direction following the course of the adjoining Llagas Creek (formerly called Coyote Creek in previous environmental reports).

Boring DP-1 and DP-2 were continuously cored to 23 and 25 feet bgs (detailed boring logs included in Appendix E). Groundwater was not producing at DP-1 so the boring was hydro-punched to a depth of 32 feet.

Borings DP-3 and DP-4 were hydropunched to depths of 28 and 32 feet bgs, then pulled back and screened from 14 to 18 feet bgs, with groundwater measured at depths of 12.3 and 16.6 feet bgs, respectively. Boring logs constructed for continuously cored borings DP-1 and DP-2 and field notes documenting the drilling program are provided in Appendix E.

Soil boring cores showing gravelly silty sand.

Soil Observations:

- Continuous-cored soils collected from DP-1 and DP-2 did not exhibit any indication of chemical related impacts (i.e., no visual, olfactory, or detections of VOCs with field PID).

- Continuously cored soil samples confirmed that the Site is underlain with relatively permeable gravelly silty sands to then less permeable sandy clay and clayey gravelly sand (detailed boring logs included in Appendix E). Groundwater was encountered at 15.4 and 12.3 feet bgs in borings DP-1 and DP-2.

<u>*Driven Probe Soil Sampling*</u>: Soil samples from DP-1 and DP-2 we collected from just above stabilized groundwater (i.e., the capillary fringe). The samples were collected at 12 and 10 feet bgs, respectively. The collected capillary fringe soil samples were submitted to a State-certified laboratory for the following analysis:

- VOCs by EPA Method 8260 (Volatile constituent fuel compounds)

In addition to the 4 driven probe (DP) borings, five (5) discrete shallow borings (SB-1 through SB-5) were also advanced at locations where agricultural equipment was stored and maintained. Each of these shallow borings were advanced to a depth of 4 feet bgs to inspect the soil for signs of impacts and to collect a soil sample from 2 feet bgs. The collected shallow boring samples were submitted to a State-certified laboratory for the following analysis:

- Total Petroleum Hydrocarbons (TPH) as Diesel and Motor Oil by LUFT/FFP

- VOCs by EPA Method 8260 (Volatile constituent fuel compounds)

Analytical results of the laboratory tested groundwater and soil samples from the driven probe borings DP-1 through DP-4, and SB-1 thorough SB-5 are tabulated on Tables 2 and 5, and presented graphically on Figures 6 and 9. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

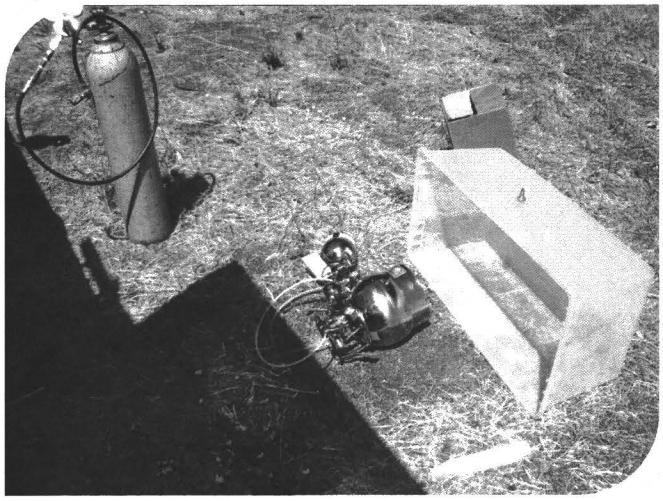
Shallow Soil Composite Sampling Operations:

Seven (7) four-point composite samples were collected from a total of twenty-eight (28) near surface locations (i.e., Comp-1 through Comp-7) from locations targeting the agricultural portion of the property (see Figure 5 and Table 1). The near surface samples were collected from a depth of 3 to 6 inches bgs. The collected samples were submitted to a State-certified laboratory and analyzed for the following:

- Persistent Organochlorine Pesticides (OCPs) by EPA Method 8081A

In addition, a single discrete shallow soil sample was also gathered from one of the four locations from each quadrant, as indicated on Figure 5. These discrete samples were submitted to a State-certified laboratory for the following analysis:

- Arsenic by EPA Method 6010B



WHA field staff collecting soil vapor samples into summa canisters.

Due to slightly elevated concentrations of dieldrin detected in certain samples from the initial seven (7) four-point composite samples described above, some additional limited testing was completed to evaluate for the leachability potential of residual dieldrin present in shallow soils. One (1) discrete sample was taken at the center of Comp-3 (equidistant from the previous four Comp-3 composite sample locations). The discrete sample, "Comp-3-eS", was submitted to a State-certified laboratory for the following analysis:

- Dieldrin STLB by EPA Method 8081, Modified STLC Extract

The composite and discrete samples collected from this grid across the subject Site followed established protocols for assessing property transitioning from agricultural to residential land-use, as described in

the California Department of Toxic Substances Control (DTSC) *Interim Protocol for Sampling Agricultural Properties*[1].

Analytical results of the laboratory tested soil composite and discrete samples are tabulated on Table 1, and presented graphically on Figure 5. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

Soil Vapor Sampling Operations:

Four (4) temporary soil vapor borings (SV-1 through SV-4) were constructed at strategic locations in the vicinity of the former gasoline UST release at the property (see Figure 8 and Table 4). The soil vapor samples were collected using our *Field Methodology for Active Soil Gas Sampling*, which is presented in Appendix E. All of the samples were collected from depth of 5 feet bgs and submitted to a State-certified laboratory for the following analysis:

- TPH as Gasoline by EPA Method TO-3
- VOCs by EPA Method TO-15

Analytical results of the laboratory tested soil vapor samples are tabulated on Table 4, and presented graphically on Figure 8. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

Asbestos/Lead Surface Soil Sampling Operations:

Based upon the age of Site infrastructure and long-term agricultural equipment usage around the barn and residential garage, asbestos and lead sampling was conducted to evaluate for lead-based paint and asbestos impacts to shallow soil around the structures. Eight (8) surface soil samples (LA-1 through LA-8) were gathered at a depth of 3 inches bgs at locations around each of the historical buildings (see Figure 7 and Table 3). *Note: We advanced two of these borings along the observed footprint of the older historical residence, which is visible on historical aerial photographs dating back to 1939.*

These soil samples were each collected at a depth of 3 feet bgs and submitted to a State-certified laboratory for the following analysis:

- Lead by EPA Method 6010B
- Asbestos by EPA Method 600/R-93/116

Analytical results of the laboratory tested soil lead/asbestos samples are tabulated on Table 3, and presented graphically on Figure 7. Field notes, and the Certified Analytical Reports issued by the testing laboratory are presented in Appendix E.

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[1]: *Interim Guidance for Sampling Agricultural Properties (Third Revision),* Department of Toxic Substances Control, dated August 7, 2008. This guidance document provides a sampling protocol for evaluating a former agricultural property that is known to have had or likely had uniformly applied organochlorine pesticides (OCPs). Based on the historical aerial maps for the subject Site showing orchards and row crops in portions of the Site, it is presumed that such pesticides were applied.

8.2 Laboratory Analytical Results

The following subsections present the analytical results from the driven probe borings (groundwater and soil analysis), shallow soil composite sampling for persistent pesticides, soil vapor and shallow soil sampling adjoining the site structures for lead and asbestos. All samples were submitted to the following State-certified laboratories:

- *BC Laboratories, Inc., for soil and groundwater analyses*
- *Torrent Laboratory, Inc., for soil vapor analyses*
- *LA Testing, for soil asbestos analyses*

Driven Probe Groundwater Analytical Results:

The four (4) groundwater samples collected from borings DP-1 through DP-4 (see Figure 9 and Table 5 for complete dataset) revealed the following:

- Trace detections of **benzene** and **toluene** from DP-2, at 0.17 and 0.15 µg/L, respectively. Both detections are well below the Central Coast Region Water Quality Goals (WQGs) for benzene and toluene of 1.0 and 150 µg/L, respectively.
- All other samples were non-detectable for the petroleum hydrocarbons and constituent VOCs evaluated.

Driven Probe Soil Analytical Results:

The driven probe soil samples collected from borings DP-1, DP-2, and SB-1 through SB-5, revealed the following (see Figure 6 and Table 2 for complete dataset):

- Trace detections of **TPH as diesel** were present in borings SB-2 and SB-4, at 4.3 and 4.9 mg/kg, respectively. Both detections were well below the *Environmental Screening Level*[2] (ESL) of 83 mg/kg.
- All other constituents analyzed were non-detectable.

Shallow Soil OCP/Dieldrin STLC/Arsenic Analytical Results:

The shallow soil samples collected from the seven (7) quadrants throughout the historically agricultural portions of the Site (depicted on Figure 5 and presented on Table 1) revealed the following:

- Dieldrin: Sample composites Comp-3, Comp-4 and Comp-6 had detections of **dieldrin**[3] at 0.018, 0.0054 and 0.0068 mg/kg,

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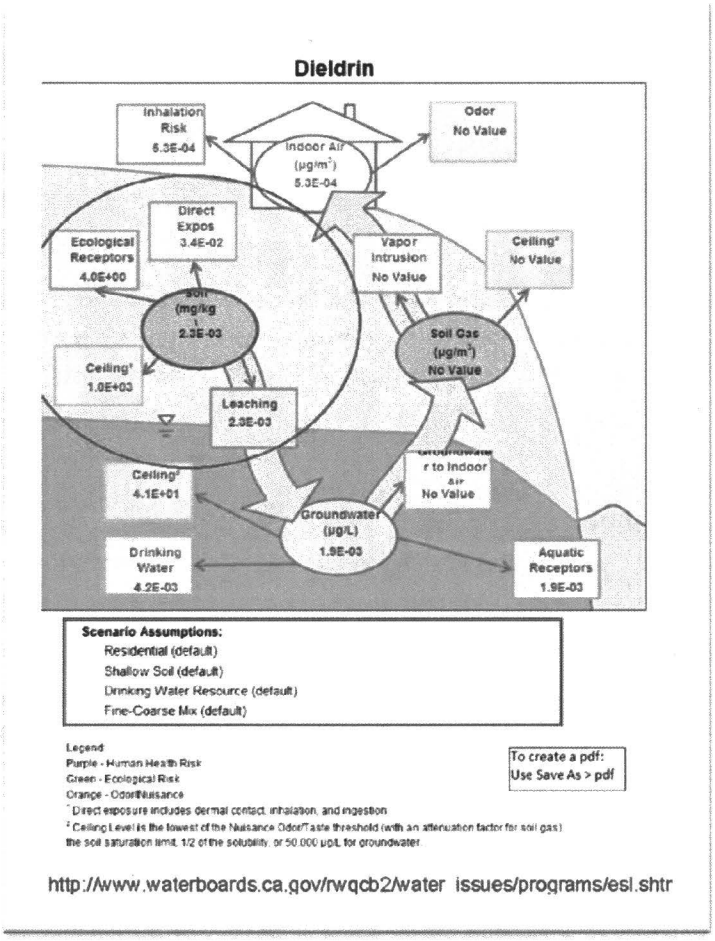
[2]: *Environmental Screening Levels (ESLs):* The California Regional Water Quality Control Board - San Francisco Bay Region developed these screening limits in a guideline document *("Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater",* Interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted based on conservative risk and leachability model inputs. The ESLs referenced here were obtained from the Table A. *Shallow Soils (<3m) where groundwater IS a current or potential Source of Drinking Water*.

- Residential *California Human Health Screening Levels*[4] (CHHSLs): These concentrations do not exceed the human health and safety threshold concentration for residential land use (i.e. concentrations were less than the established CHHSL of 0.035mg/kg ; or parts per million, ppm).

- Residential Environmental Screening Levels (ESLs): These concentrations did exceed the *leachable* ESL threshold for dieldrin (i.e., 0.0023 ppm, or 2.3 parts per billion). However, none of these detections exceed the residential ESL threshold concentration established the *direct exposure*, (nuisance), or *ecological risk* thresholds.

  In consultation with lead Water Board staff[5], confirmation laboratory re-analysis was completed on soil collected from the Site quadrant having the highest total dieldrin concentrations (sample Comp-3-eS, Figure 5, Table 1). This soil sample was tested to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis results confirmed the site-specific leachable concentrations were non-detectable (<0.0000031 mg/L, or ppm), which is below the drinking water standard of 0.0000048 mg/L). Therefore the trace, residual concentrations of Dieldrin detected at the Site are not considered to be a threat to



[3]: Dieldrin is a chlorinated insecticide that was historically used as an alternative to DDT (common name for 4,4-DDT), particularly from the 1950s through 1970s.

[4]: California Human Health Screening Levels for Soil (CHHSLs): The CHHSLs are health-based guideline concentrations established for 54 common Hazardous *Chemicals of Concern* found in in soil or soil gas. The California Environmental Protection Agency (Cal/EPA) considers detection at or below these established threshold concentrations pose insignificant risk to human health and safety. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

[5]: CRWQCB Central Coast Water Board, Site Cleanup and Land Disposal Program, August 13, 2013.

shallow groundwater beneath the Site.

- DDx compounds: The persistent organochlorine pesticide dichlorodiphenyltrichloroethane (DDT) and its metabolites DDD, and DDE (DDx) were detected at trace concentrations, which is consistent with long term agricultural land use.
    - Trace detections of **4,4-DDE** ranging from 0.00014 to 0.011 mg/kg were present in all seven sample composites. These detections were all below the residential land-use ESL and CHHSL for 4,4'DDE of 1.7 and 1.6 mg/kg.
    - Trace detections of **4,4-DDT** ranging from 0.00073 to 0.0053 were present in composite Comp-1, Comp-3, Comp-6 and Comp-7. These detections were all below the residential land-use ESL and CHHSL for 4,4'DDT of 1.7 and 1.6 mg/kg.
    - A single trace detection of **4,4-DDD** from sample composite at 0.0012 mg/kg, well below the residential land-use ESL and CHHSL of 2.4 and 2.3 mg/kg.
- Arsenic All of the discrete samples (Comp-1-c, Comp-2-d, Comp-3-c, Comp-4-a, Comp-5-b, Comp-6-d and Comp-7-b) had detections of naturally-occurring **arsenic** ranging from 2.9 to 3.9 mg/kg. These concentrations are well within the range of naturally occurring arsenic concentrations in this region[6], and do not appear to be a result of historically agricultural operations. These naturally-occurring concentrations of arsenic exceed the soil screening thresholds established in the ESLs/CHHSLs but are not considered a land use health risk because they are naturally occurring concentrations.
- All other pesticide compounds were non-detectable.

In summary, all tested persistent pesticide compounds came back as non-detect except for some trace detections of DDT (< 0.2 mg/kg) and Dieldrin (<0.018 mg/kg). Arsenic concentrations are well within the range of naturally occurring concentrations for the region. No human health and safety CHHSLs were exceeded (see attached table). Solubility analysis confirmed the leachable concentrations of the persistent pesticide dieldrin were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site.

Soil Vapor Analytical Results:

The soil vapor samples collected from the four (4) temporary soil vapor probes positioned throughout the historical UST fuel release zone revealed the following (see Figure 8 and Table 4 for complete dataset):

- Low-level detections of **TPH as gasoline** in samples SV-2 through SV-4, ranging from 160 to 550 µg/m^3, well below the residential ESL of 370,000 µg/m^3.

[6]: *Interim Guidance for Sampling Agricultural Properties (Third Revision),* Department of Toxic Substances Control, dated August 7, 2008. This guidance document states that, "If all the arsenic results for the site are at or below 12 mg/kg, then collection of background samples will not be required".

- Low-level detections of **benzene** in samples SV-2 and SV-4, at 4.64 and 3.22 µg/m^3, respectively. Both detections were well below the residential CHHSL and ESL for benzene of 36.2 and 42 µg/m^3.
- Low-level detections of **ethylbenzene** in samples SV-2 and SV-4, at 4.9 and 5.43 µg/m^3, respectively. Both detections were well below the residential ESL for ethylbenzene of 490 and 42 µg/m^3.
- A single low-level detection of **toluene** in sample SV-4, at 2.21 µg/m^3, well below the residential ESL and CHHSL for benzene of 135,000 and 160,000 µg/m^3.
- All other constituents analyzed were non-detectable.

Asbestos/Lead Soil Analytical Results:

The surface soil samples collected from eight (8) locations along current and historical Site structures (LA-1 through LA-8), revealed the following (see Figure 9 and Table 5 for complete dataset):

- Surface samples LA-1, LA-3 and LA-6 had detections of **lead** at 150, 86 and 85 mg/kg, respectively. These detections exceeded the residential ESL and CHHSL for lead in shallow soil of 80 mg/kg.
- Asbestos was not detected in any of the surface samples.

This concludes our presentation of the analytical results from the Phase II sampling program. Opinions regarding these results are presented in Section 10.3 below.

9.0 DATA GAPS

No significant data gaps were encountered during the course of this investigation. We encountered one minor data gap. Specifically, no site contact was available to verify that the parcel has remained unused for any commercial purposes subsequent to the 2003 Phase I ESA. The current Site occupant is a residential tenant and was not available for interviewing. However, based on our visual inspection of the property, there were no indications of any significant changes to Site infrastructure or commercial activities subsequent to 2003.

10.0 FINDINGS & OPINIONS

10.1 Subject Site Phase I Findings

The following environmental conditions were noted for the subject Site, based upon a review of historical information, regulatory records and a site inspection / tenant interview. Specifically, the following information was gathered:

1. Closed Fuel Release Case (LUST): We reviewed of the case history for a historical fuel release at the Site that was closed in 2001. A summary of the case history is presented in Section 5.1.

Opinion: The presence of this closed fuel release **is considered a *historical recognized environmental condition* (HREC).**

2. Historical Agricultural Land Use: Historical aerials show the site has been continuously farmed for over 70 years.

   Opinion: Persistent pesticide residues are considered a potential recognized environmental condition particularly with a land use transition to residential.

10.2 Adjoining / Surrounding Phase I Findings

Our review of historical and regulatory records for adjoining/nearby properties did not reveal any areas of concern.

1. Closed Upgradient / Sidegradient Fuel Release Case (LUST): Former Rist Quarry: We reviewed of the case history for a historical fuel release at 14905 Watsonville Road, which lay approximately 550 feet west of the Site perimeter. A summary of the case history is presented in Appendix D.

   Opinion: The presence of this closed fuel release **is considered a *de minimis environmental condition*.**

10.3 Phase II Sampling Program Findings

A *Limited Phase II Soil, Soil Vapor & Groundwater investigation* was completed to address potential **contaminants of concern associated with REC's and land use** transition from agricultural to residential. Primarily, sampling was completed to confirm whether or not there are any remaining elevated petroleum hydrocarbons from the former underground storage tank release as well potential shallow soil contamination from historical applications of agricultural chemicals within orchards and agricultural fields at the property.

The Phase II sampling program revealed the following:

- Sampling results targeting the former fuel release: No further action will be required. Groundwater, soil and soil vapor samples analyzed for petroleum hydrocarbons around the former fuel release yielded only a few trace detections of diesel and constituent volatile organic compounds (VOCs).
- Sampling results targeting lead-based paint and asbestos around Site infrastructure: Some limited soil scraping from 3 areas around the perimeter foundations will need to be completed (during, or prior to property development) to get rid of a limited volume of soil apparently impacted by lead-based paint scrapings. No detections of asbestos were found in the soil samples (FYI: Lead Results on Figure 7 and Table 3, attached).
- Sampling results targeting transition from agricultural land use to residential land use: All soil sampling results contained some limited detections of this persistent pesticide compound but the concentrations were all below the screening limits for residential health and safety concerns (i.e., CHHSL guidelines, results of shallow soil testing is shown on Figure 5 and Table 1).

However, some of these trace detections exceeded the leachability threshold established in the Water Board's *Environmental Screening Limits* (ie., ESL guidelines). In consultation with lead Water Board staff, laboratory reanalysis was completed on soil collected from the Site quadrant having the highest total dieldrin concentrations. This soil sample was re-analyzed to determine the site-specific, leachable portion of detected dieldrin. Solubility analysis confirmed the site-specific leachable concentrations were below drinking water standards and therefore the trace, residual concentrations of Dieldrin are not considered to be a threat to shallow groundwater beneath the Site.

11.0 CONCLUSIONS & RECOMMENDATIONS

We have performed a *Phase I Environmental Site Assessment* in accordance with the scope and limitations of *ASTM Practice E 1527* for a property located at 14905 Santa Teresa Boulevard in Morgan Hill. There were no exceptions to, or deletions from, this practice (i.e. data gaps), as described in Section 8.0 of this report.

This assessment did not reveal evidence of ***recognized environmental conditions*** at the subject property. However, in preparation for proposed redevelopment, a Phase II sampling program was conducted.

Based on these results, we conclude there are no environmental impediments for residential land use.

12.0 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all other warranties, express or implied. This report has been prepared solely for our client. The assessment is provided so the client may make a more informed decision as to Site conditions. This report shall not be relied upon by, or transferred to, any other party without expressed permission by our client. This ESA is not a regulatory compliance audit or an evaluation of the efficiency of the use of any hazardous materials at the Site. Unless otherwise stated no evaluation for the presence of asbestos-containing building materials, lead-based paint, urea-formaldehyde foam insulation, or other potentially hazardous building materials; methane; radon gas; lead in drinking water; or wetlands, is included in our assessment.

Our findings and opinions are based on information collected from regulatory agency files and lists, interviews, and Site conditions at the time of our Site reconnaissance. Note that our findings and opinions are based on information that we obtained on specific dates through records review, Site reconnaissance, and related activities. It is possible that other information exists or subsequently has become known, just as it is possible for conditions we observed to have changed after our observations.

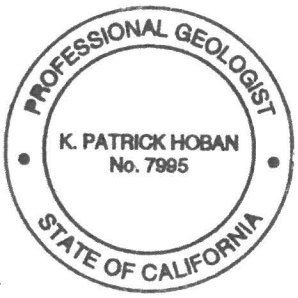
The accuracy and thoroughness of any environmental assessment depend on a variety of factors and optimally will include soil and groundwater sampling. Weber, Hayes and Associates cannot and will not provide guarantees, certifications or warranties that the investigated property is or is not free of environmental impairment. Any person who is aware of any *recognized environmental conditions* of the Site or surrounding areas that are different from those described in the report should report them immediately to this office for evaluation as part of an additional scope of work.

Thank you for this opportunity to be of service. Should you have any questions or comments regarding this project, please contact us at our offices.

Respectfully submitted,

WEBER, HAYES AND ASSOCIATES

A California Corporation



By: _____
Pat Hoban
Senior Geologist

By: _____
Jered Chaney
Project Geologist

And: _____
Jacob Aman
Staff Scientist

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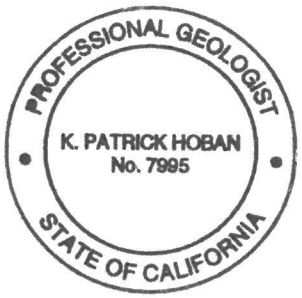
13.0 QUALIFICATION OF ENVIRONMENTAL PROFESSIONAL

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10[7] of this part.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

By _____

Pat Hoban
Senior Geologist



Pat Hoban
pat@weber-hayes.com

[7] ASTM Standard E 1527-05, X2.1.1 and Federal Register 40 CFR Part 312, §312.10:
Environmental Professional means:

(1) A person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases...on, at, in, or to a property, sufficient to meet the objectives and performance factors...

(2) Such a person must:

(i) **Hold a current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or** U.S. territory (or the Commonwealth of Puerto Rico) and have the equivalent of three (3) years of full-time relevant experience; or

(ii) Be licensed or certified by the federal government, a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) to perform **environmental inquiries ... and have the equivalent of three (3) years of full-time** relevant experience; or

(iii) Have a Baccalaureate or higher degree from an accredited institution of higher education in a discipline of engineering or science and the equivalent of five (5) years of full-time relevant experience; or

(iv) Have the equivalent of ten (10) years of full-time relevant experience...

14.0 REFERENCES

STANDARDS, GUIDANCE DOCUMENTS & DATABASES

ASTM E1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*; 2005

ASTM E2600-10, Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions, 2010.

California Human Health Screening Levels (CHHSLs) – Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties, California Environmental Protection Agency, January 2005.

California State Online GeoTracker Database, www.geotracker.swrcb.ca.gov, 2013.

Santa Clara County Department of Environmental Health LUSTOP website, http://lustop.sccgov.org/, 2013

Interim Guidance for Sampling Agricultural Properties (Third Revision), Department of Toxic Substances Control, dated August 7, 2008.

SUBJECT SITE: ENVIRONMENTAL REPORTS, REGULATORY LETTERS & RELATED DOCUMENTS

Well Abandonment, Finalizing Site Closure: Ruth Jones Property, Weber, Hayes and Associates, dated April 16, 2001.

Fuel Leak Site Case Closure—Ruth jones Residnce, 14905 Santa Teresa Boulevard, Morgan Hill, CA; Case No. 14-417, Leaking Underground Storage Tank Oversight Program, dated January 9, 2001.

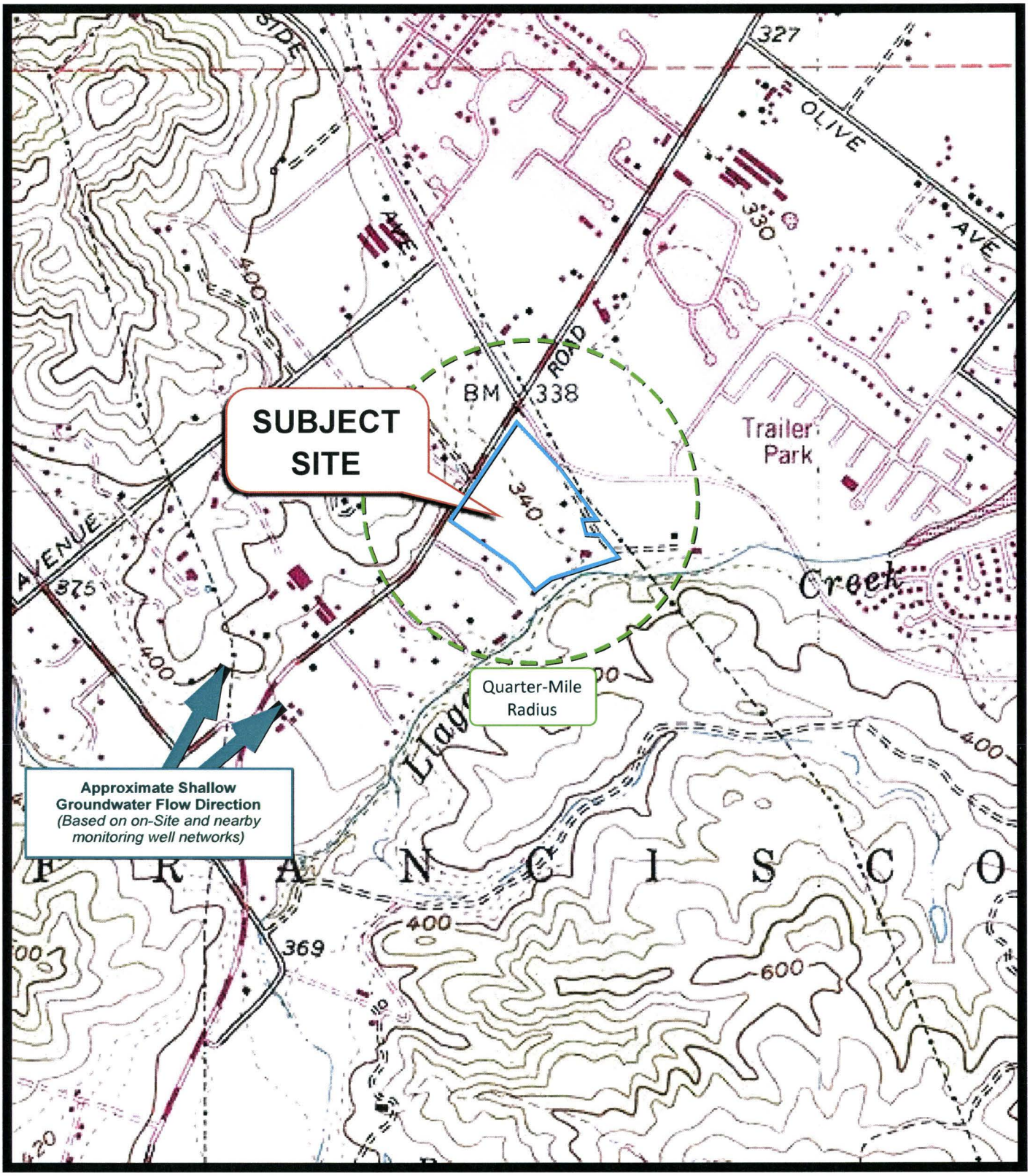
Case Closure Summary: Leaking Underground Storage Tank Program: Ruth Jones Residence, State Water Resources Control Board, dated November 28, 2000.

VICINITY SITES: ENVIRONMENTAL REPORTS, REGULATORY LETTERS & RELATED DOCUMENTS

Fuel Leak Site Case Closure—Rist Quarry, 14905 Watsonville Road, Morgan Hill, CA; Case No. 14-066, Leaking Underground Storage Tank Oversight Program, dated April 4, 1996.

Case Closure Summary: Leaking Underground Storage Tank Program: Rist Quarry, State Water Resources Control Board, dated February 28, 1996.

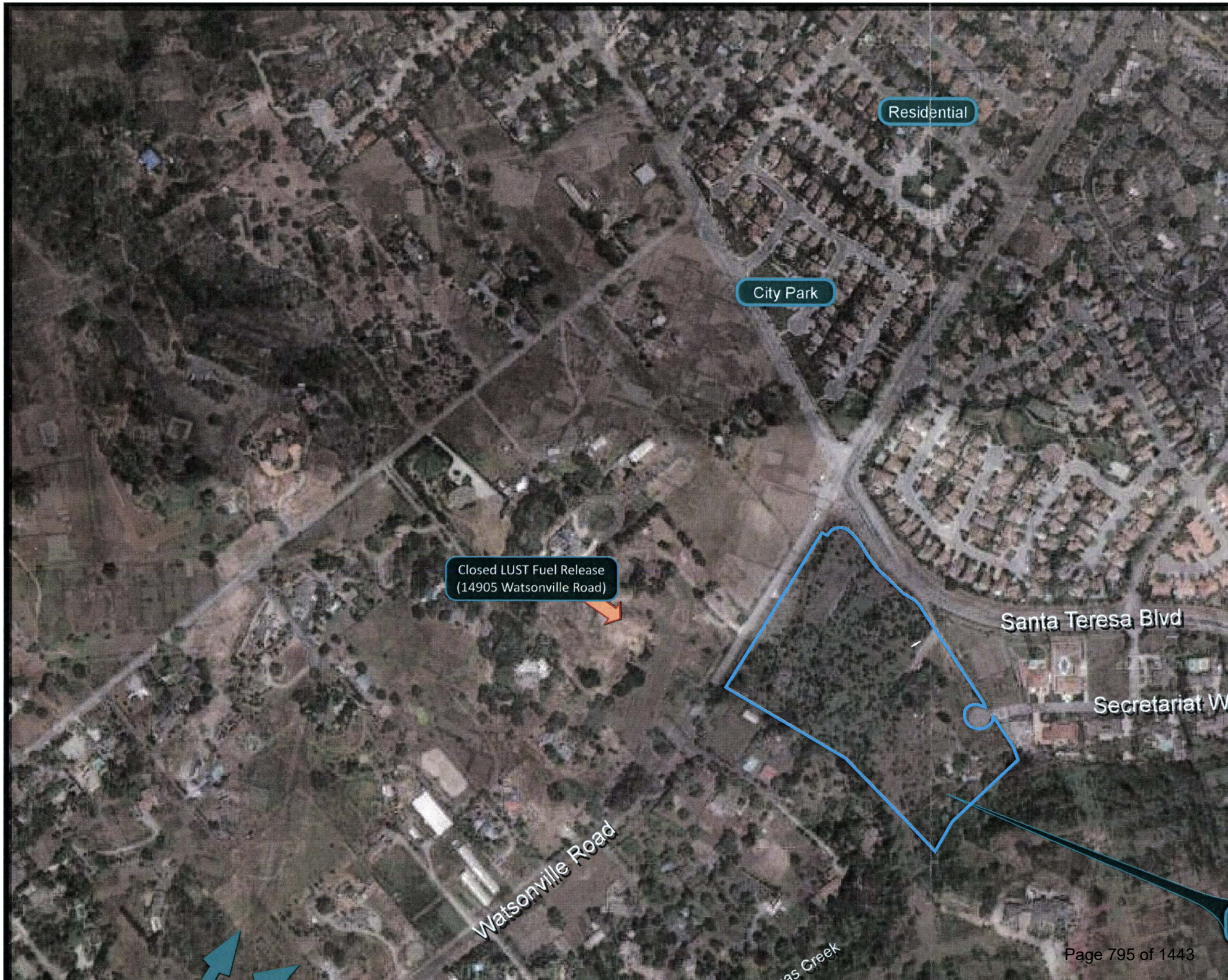
FIGURES



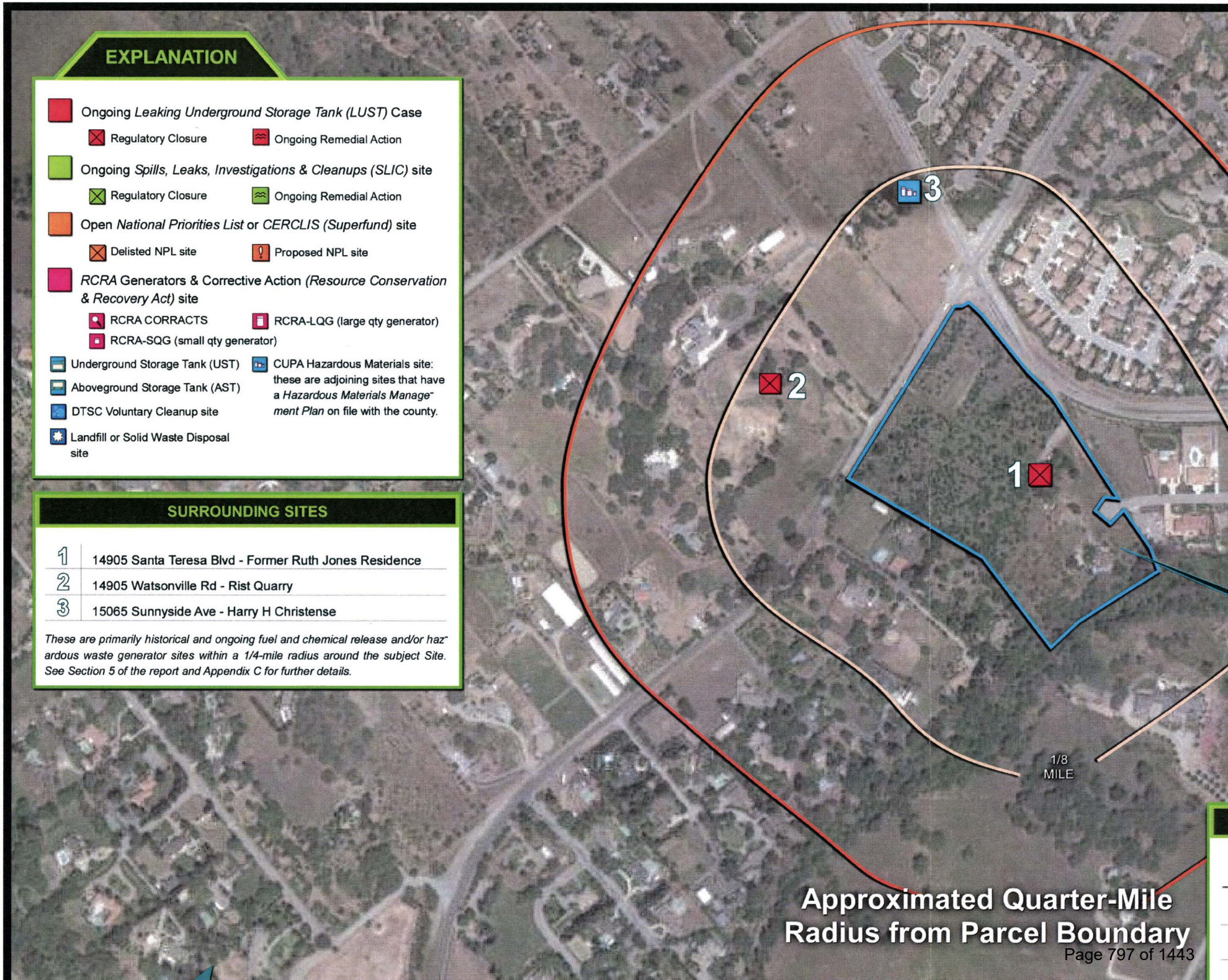
Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com

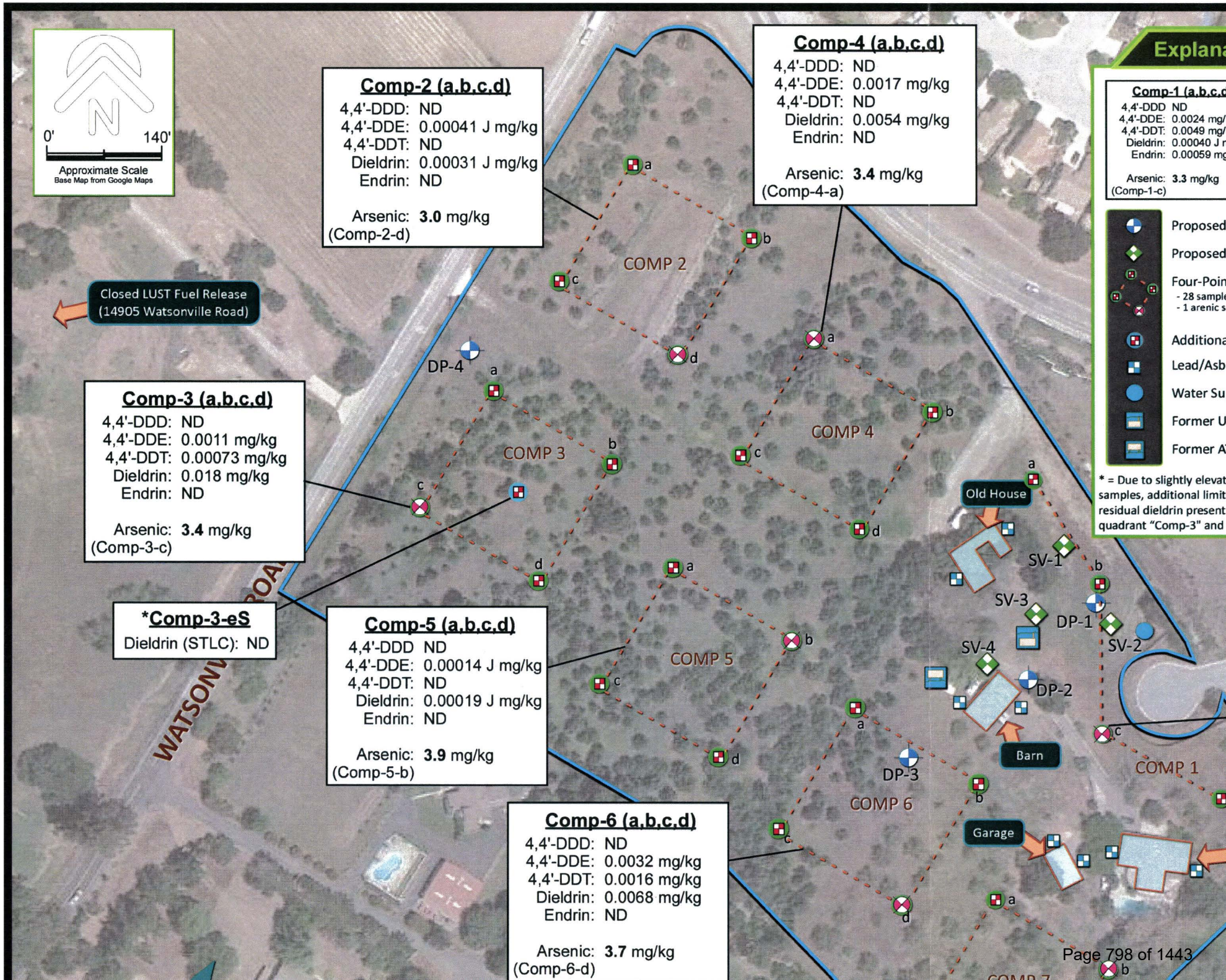
Location Map
Phase I Environmental Site Assessment
14905 Santa Teresa Blvd
Morgan Hill, California

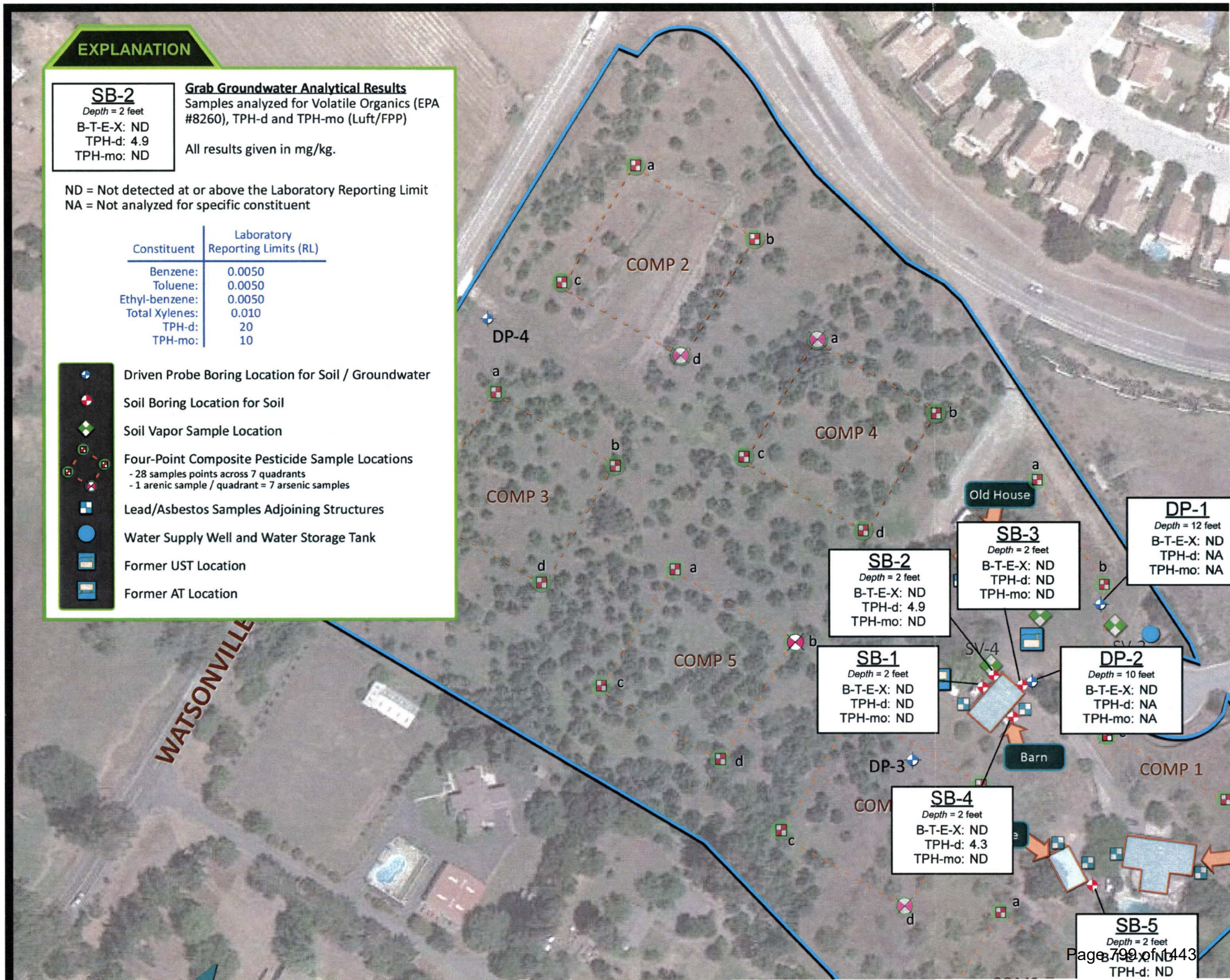
Figure 1
Job # 2X330

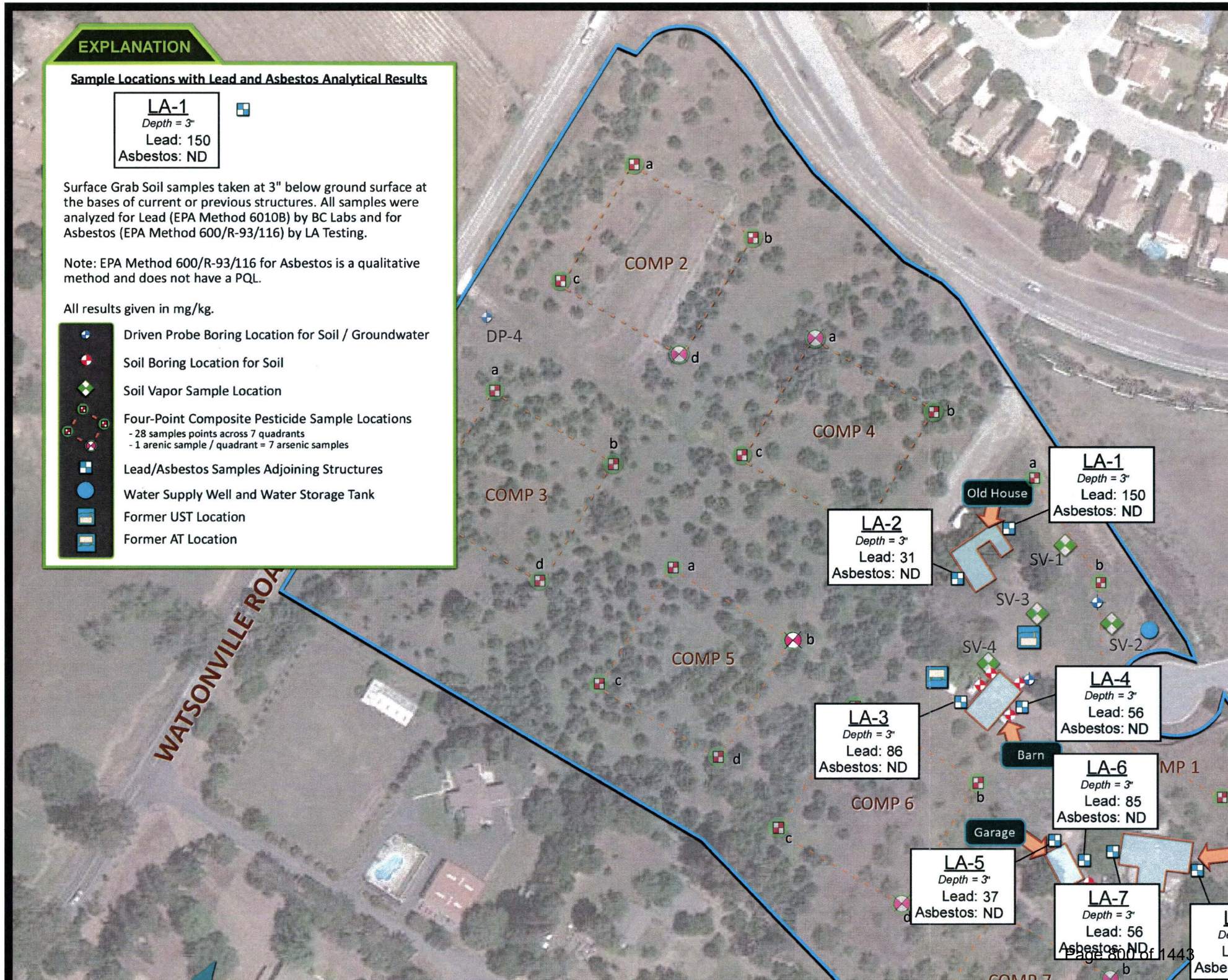

Residential
City Park
Closed LUST Fuel Release
(14905 Watsonville Road)
Santa Teresa Blvd
Secretariat W
Watsonville Road

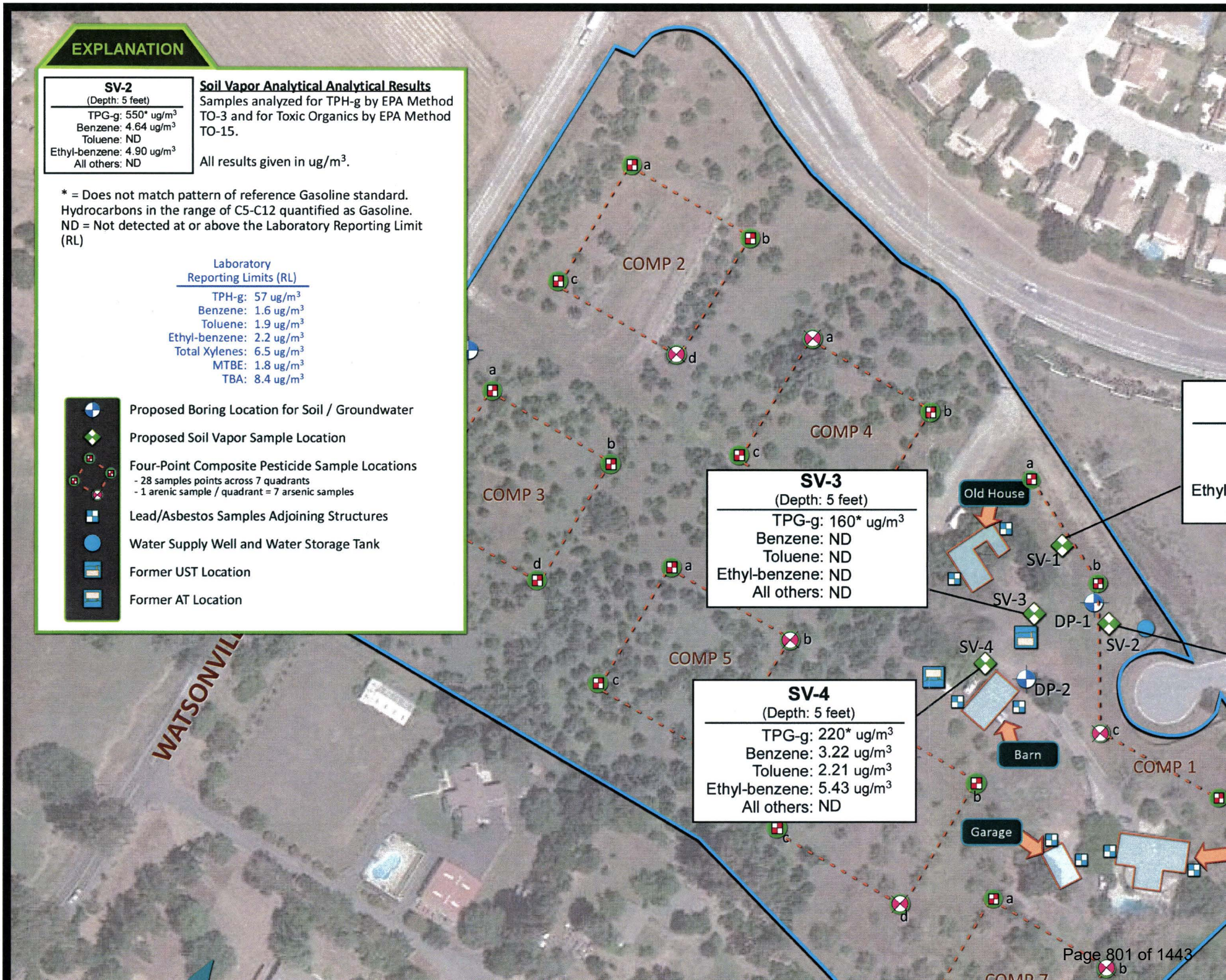
Inclined mound
Closed LUST Fuel Release
(14905 Watsonville Road)
Former Christmas
Tree Farm
Old House
WATSONVILLE ROAD
Barn
Garage

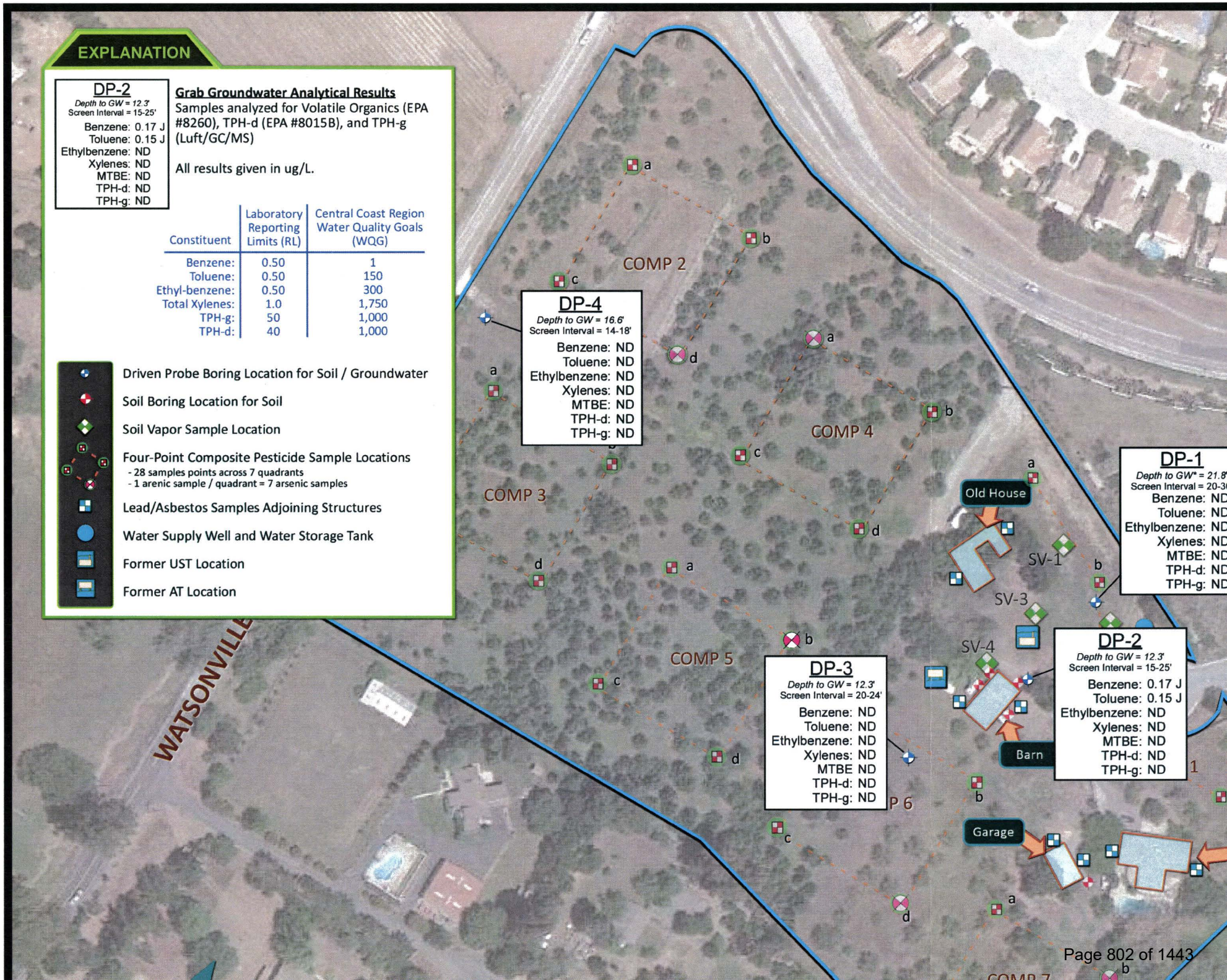

EXPLANATION
Ongoing Leaking Underground Storage Tank (LUST) Case
Regulatory Closure
Ongoing Remedial Action
Ongoing Spills, Leaks, Investigations & Cleanups (SLIC) site
Regulatory Closure
Ongoing Remedial Action
Open National Priorities List or CERCLIS (Superfund) site
Delisted NPL site
Proposed NPL site
RCRA Generators & Corrective Action (Resource Conservation & Recovery Act) site
RCRA CORRACTS
RCRA-LQG (large qty generator)
RCRA-SQG (small qty generator)
Underground Storage Tank (UST)
Aboveground Storage Tank (AST)
DTSC Voluntary Cleanup site
Landfill or Solid Waste Disposal site
CUPA Hazardous Materials site: these are adjoining sites that have a Hazardous Materials Management Plan on file with the county.
SURROUNDING SITES
1 14905 Santa Teresa Blvd - Former Ruth Jones Residence
2 14905 Watsonville Rd - Rist Quarry
3 15065 Sunnyside Ave - Harry H Christense
These are primarily historical and ongoing fuel and chemical release and/or hazardous waste generator sites within a 1/4-mile radius around the subject Site. See Section 5 of the report and Appendix C for further details.
1
2
3
1/8 MILE
Approximated Quarter-Mile Radius from Parcel Boundary


N
0'
140'
Approximate Scale
Base Map from Google Maps
Comp-2 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.00041 J mg/kg
4,4'-DDT: ND
Dieldrin: 0.00031 J mg/kg
Endrin: ND
Arsenic: 3.0 mg/kg
(Comp-2-d)
Comp-4 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0017 mg/kg
4,4'-DDT: ND
Dieldrin: 0.0054 mg/kg
Endrin: ND
Arsenic: 3.4 mg/kg
(Comp-4-a)
Explana
Comp-1 (a,b,c,d
4,4'-DDD ND
4,4'-DDE: 0.0024 mg/
4,4'-DDT: 0.0049 mg/
Dieldrin: 0.00040 J r
Endrin: 0.00059 mg
Arsenic: 3.3 mg/kg
(Comp-1-c)
Proposed
Proposed
Four-Poin
- 28 sample
- 1 arenic s
Additiona
Lead/Asb
Water Su
Former U
Former A
* = Due to slightly elevat
samples, additional limit
residual dieldrin present
quadrant "Comp-3" and
Closed LUST Fuel Release
(14905 Watsonville Road)
Comp-3 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0011 mg/kg
4,4'-DDT: 0.00073 mg/kg
Dieldrin: 0.018 mg/kg
Endrin: ND
Arsenic: 3.4 mg/kg
(Comp-3-c)
*Comp-3-eS
Dieldrin (STLC): ND
Comp-5 (a,b,c,d)
4,4'-DDD ND
4,4'-DDE: 0.00014 J mg/kg
4,4'-DDT: ND
Dieldrin: 0.00019 J mg/kg
Endrin: ND
Arsenic: 3.9 mg/kg
(Comp-5-b)
Comp-6 (a,b,c,d)
4,4'-DDD: ND
4,4'-DDE: 0.0032 mg/kg
4,4'-DDT: 0.0016 mg/kg
Dieldrin: 0.0068 mg/kg
Endrin: ND
Arsenic: 3.7 mg/kg
(Comp-6-d)
COMP 1
COMP 2
COMP 3
COMP 4
COMP 5
COMP 6
DP-1
DP-2
DP-3
DP-4
SV-1
SV-2
SV-3
SV-4
Old House
Barn
Garage
WATSONV
ROA


EXPLANATION
SB-2
Depth = 2 feet
B-T-E-X: ND
TPH-d: 4.9
TPH-mo: ND
Grab Groundwater Analytical Results
Samples analyzed for Volatile Organics (EPA #8260), TPH-d and TPH-mo (Luft/FPP)
All results given in mg/kg.
ND = Not detected at or above the Laboratory Reporting Limit
NA = Not analyzed for specific constituent
Constituent | Laboratory Reporting Limits (RL)
Benzene: 0.0050
Toluene: 0.0050
Ethyl-benzene: 0.0050
Total Xylenes: 0.010
TPH-d: 20
TPH-mo: 10
Driven Probe Boring Location for Soil / Groundwater
Soil Boring Location for Soil
Soil Vapor Sample Location
Four-Point Composite Pesticide Sample Locations
- 28 samples points across 7 quadrants
- 1 arenic sample / quadrant = 7 arsenic samples
Lead/Asbestos Samples Adjoining Structures
Water Supply Well and Water Storage Tank
Former UST Location
Former AT Location
COMP 2
COMP 3
COMP 4
COMP 5
COMP 1
DP-4
DP-3
Old House
Barn
SB-3
Depth = 2 feet
B-T-E-X: ND
TPH-d: ND
TPH-mo: ND
SB-2
Depth = 2 feet
B-T-E-X: ND
TPH-d: 4.9
TPH-mo: ND
SB-1
Depth = 2 feet
B-T-E-X: ND
TPH-d: ND
TPH-mo: ND
SB-4
Depth = 2 feet
B-T-E-X: ND
TPH-d: 4.3
TPH-mo: ND
SB-5
Depth = 2 feet
B-T-E-X: ND
TPH-d: ND
DP-1
Depth = 12 feet
B-T-E-X: ND
TPH-d: NA
TPH-mo: NA
DP-2
Depth = 10 feet
B-T-E-X: ND
TPH-d: NA
TPH-mo: NA
SV-4
WATSONVILLE


EXPLANATION
Sample Locations with Lead and Asbestos Analytical Results
LA-1
Depth = 3"
Lead: 150
Asbestos: ND
Surface Grab Soil samples taken at 3" below ground surface at the bases of current or previous structures. All samples were analyzed for Lead (EPA Method 6010B) by BC Labs and for Asbestos (EPA Method 600/R-93/116) by LA Testing.
Note: EPA Method 600/R-93/116 for Asbestos is a qualitative method and does not have a PQL.
All results given in mg/kg.
Driven Probe Boring Location for Soil / Groundwater
Soil Boring Location for Soil
Soil Vapor Sample Location
Four-Point Composite Pesticide Sample Locations
- 28 samples points across 7 quadrants
- 1 arenic sample / quadrant = 7 arsenic samples
Lead/Asbestos Samples Adjoining Structures
Water Supply Well and Water Storage Tank
Former UST Location
Former AT Location
WATSONVILLE ROA
COMP 2
COMP 3
COMP 4
COMP 5
COMP 6
DP-4
Old House
Barn
Garage
SV-1
SV-2
SV-3
SV-4
LA-1
Depth = 3"
Lead: 150
Asbestos: ND
LA-2
Depth = 3"
Lead: 31
Asbestos: ND
LA-3
Depth = 3"
Lead: 86
Asbestos: ND
LA-4
Depth = 3"
Lead: 56
Asbestos: ND
LA-5
Depth = 3"
Lead: 37
Asbestos: ND
LA-6
Depth = 3"
Lead: 85
Asbestos: ND
LA-7
Depth = 3"
Lead: 56
Asbestos: ND
MP 1


EXPLANATION
SV-2
(Depth: 5 feet)
TPG-g: 550* ug/m3
Benzene: 4.64 ug/m3
Toluene: ND
Ethyl-benzene: 4.90 ug/m3
All others: ND
Soil Vapor Analytical Analytical Results
Samples analyzed for TPH-g by EPA Method TO-3 and for Toxic Organics by EPA Method TO-15.
All results given in ug/m3.
* = Does not match pattern of reference Gasoline standard.
Hydrocarbons in the range of C5-C12 quantified as Gasoline.
ND = Not detected at or above the Laboratory Reporting Limit (RL)
Laboratory Reporting Limits (RL)
TPH-g: 57 ug/m3
Benzene: 1.6 ug/m3
Toluene: 1.9 ug/m3
Ethyl-benzene: 2.2 ug/m3
Total Xylenes: 6.5 ug/m3
MTBE: 1.8 ug/m3
TBA: 8.4 ug/m3
Proposed Boring Location for Soil / Groundwater
Proposed Soil Vapor Sample Location
Four-Point Composite Pesticide Sample Locations
- 28 samples points across 7 quadrants
- 1 arenic sample / quadrant = 7 arsenic samples
Lead/Asbestos Samples Adjoining Structures
Water Supply Well and Water Storage Tank
Former UST Location
Former AT Location
COMP 2
COMP 3
COMP 4
COMP 5
COMP 1
SV-3
(Depth: 5 feet)
TPG-g: 160* ug/m3
Benzene: ND
Toluene: ND
Ethyl-benzene: ND
All others: ND
SV-4
(Depth: 5 feet)
TPG-g: 220* ug/m3
Benzene: 3.22 ug/m3
Toluene: 2.21 ug/m3
Ethyl-benzene: 5.43 ug/m3
All others: ND
Old House
SV-1
SV-3
DP-1
SV-2
SV-4
DP-2
Barn
Garage
WATSONVIL
Ethyl


EXPLANATION
DP-2
Depth to GW = 12.3'
Screen Interval = 15-25'
Benzene: 0.17 J
Toluene: 0.15 J
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND
Grab Groundwater Analytical Results
Samples analyzed for Volatile Organics (EPA #8260), TPH-d (EPA #8015B), and TPH-g (Luft/GC/MS)
All results given in ug/L.
Constituent | Laboratory Reporting Limits (RL) | Central Coast Region Water Quality Goals (WQG)
Benzene: | 0.50 | 1
Toluene: | 0.50 | 150
Ethyl-benzene: | 0.50 | 300
Total Xylenes: | 1.0 | 1,750
TPH-g: | 50 | 1,000
TPH-d: | 40 | 1,000
Driven Probe Boring Location for Soil / Groundwater
Soil Boring Location for Soil
Soil Vapor Sample Location
Four-Point Composite Pesticide Sample Locations
- 28 samples points across 7 quadrants
- 1 arenic sample / quadrant = 7 arsenic samples
Lead/Asbestos Samples Adjoining Structures
Water Supply Well and Water Storage Tank
Former UST Location
Former AT Location
COMP 2
COMP 3
COMP 4
COMP 5
DP-4
Depth to GW = 16.6'
Screen Interval = 14-18'
Benzene: ND
Toluene: ND
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND
DP-3
Depth to GW = 12.3'
Screen Interval = 20-24'
Benzene: ND
Toluene: ND
Ethylbenzene: ND
Xylenes: ND
MTBE ND
TPH-d: ND
TPH-g: ND
DP-1
Depth to GW = 21.8'
Screen Interval = 20-30
Benzene: ND
Toluene: ND
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND
DP-2
Depth to GW = 12.3'
Screen Interval = 15-25'
Benzene: 0.17 J
Toluene: 0.15 J
Ethylbenzene: ND
Xylenes: ND
MTBE: ND
TPH-d: ND
TPH-g: ND
Old House
Barn
Garage
SV-1
SV-3
SV-4
WATSONVILLE
P 6

TABLES

Table 1: Soil Sample Results
Persistent Organochlorine Pesticide (OCP) and Arsenic Analysis
14905 Santa Teresa Boulevard, Morgan Hill, California

All soil results are in parts per million (mg/kg).

Sample Information			Metals by EPA #6010.B	Persistent Organochlorine Compounds by EPA #8081A											
Sample ID#	Sample Type *(discrete or composite)*	Depth (inches below ground surface)	Arsenic	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Alpha-BHC (HCH alpha)	Beta-BHC (HCH beta)	Chlordane (technical)	delta-BHC (HCH delta)	Dieldrin	*Soluble Dieldrin (mg/L)	Endosulfan I	Endosulfan II
Comp-1 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	ND	0.0024	0.0049	ND	ND	ND	ND	ND	0.00040 J	--	ND	ND
Comp-1-c	Discrete	3 - 6"	3.3	--	--	--	--	--	--	--	--	--	--	--	--
Comp-2 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	ND	0.00041 J	ND	ND	ND	ND	ND	ND	0.00031 J	--	ND	ND
Comp-2-d	Discrete	3 - 6"	3.0	--	--	--	--	--	--	--	--	--	--	--	--
Comp-3 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	ND	0.0011	0.00073	ND	ND	ND	ND	ND	**0.018**	--	ND	ND
Comp-3-c	Discrete	3 - 6"	3.4	--	--	--	--	--	--	--	--	--	--	--	--
Comp-3-eS	Discrete	3 - 6"	--	--	--	--	--	--	--	--	--	--	ND	--	--
Comp-4 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	ND	0.0017	ND	ND	ND	ND	ND	ND	**0.0054**	--	ND	ND
Comp-4-a	Discrete	3 - 6"	3.4	--	--	--	--	--	--	--	--	--	--	--	--
Comp-5 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	ND	0.00014 J	ND	ND	ND	ND	ND	ND	0.00019 J	--	ND	ND
Comp-5-b	Discrete	3 - 6"	3.9	--	--	--	--	--	--	--	--	--	--	--	--
Comp-6 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	ND	0.0032	0.0016	ND	ND	ND	ND	ND	**0.0068**	--	ND	ND
Comp-6-d	Discrete	3 - 6"	3.7	--	--	--	--	--	--	--	--	--	--	--	--
Comp-7 (a,b,c,d)	Composite (4-point)	3 - 6 "	--	0.0012	0.011	0.0053	ND	ND	ND	ND	ND	0.00089	--	ND	ND
Comp-7-b	Discrete	3 - 6"	2.9	--	--	--	--	--	--	--	--	--	--	--	--
Laboratory Reporting Limit (RL):			1.0	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.050	0.00050	0.00050	0.0000031	0.00050	0.00050
Environmental Screening Levels [1] Screening Levels Residential / Industrial			0.39 / **40**	2.4 / **290**	1.7 / **4.0**		0.032 / **0.35**	--	--	0.44 / **15**	--	0.0023 / **0.0023**	0.0000042	0.0046 / **0.0046**	
CHHSLs [2] Screening Levels Residential / Industrial			0.070 / **0.24**	2.3 / **9.0**	1.6 / **6.3**		0.033 / **0.13**	--	--	0.43 / **1.7**	--	0.035 / **0.13**	--	--	

Notes

1 = **Environmental Screening Levels (ESLs):** California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entiled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (i contamination should be warranted. The ESLs used for this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water. The ESL do gasoline, whereas "residual fuels" include fuel oil (bunker fuel), lubricating oils (motor oil, oil and grease, waste oils) and asphalts.

Table 2: Soil Sample Results, July 12, 2013
Total Petroleum Hydrocarbons and Volatile Organic Analysis
14905 Santa Teresa Boulevard, Morgan Hill, California

All soil results are in parts per million (mg/kg).

Sample Information			Total Petroleum Hydrocarbons by LUFT/FFP		Volatile Organic Analysis by EPA #8260				
Sample ID#	**Sample Type *(discrete or composite)***	**Depth (feet below ground surface)**	**Diesel**	**Motor Oil**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**	**MTBE**
DP-1	**Discrete**	12'	--	--	ND	ND	ND	ND	ND
DP-2	**Discrete**	10'	--	--	ND	ND	ND	ND	ND
SB-1	**Discrete**	2'	ND	ND	ND	ND	ND	ND	ND
SB-2	**Discrete**	2'	4.9	ND	ND	ND	ND	ND	ND
SB-3	**Discrete**	2'	ND	ND	ND	ND	ND	ND	ND
SB-4	**Discrete**	2'	4.3	ND	ND	ND	ND	ND	ND
SB-5	**Discrete**	2'	ND	ND	ND	ND	ND	ND	ND
Laboratory Reporting Limit (RL):			20	10	0.0050	0.0050	0.0050	0.010	0.0050
Environmental Screening Levels [1] **Screening Levels Residential / Industrial**			**83 / 83**	**500 / 2,500**	**0.044 / 0.044**	**2.9 / 2.9**	**2.9 /3.3**	**2.3 / 2.3**	**0.023 / 0.023**

Notes

1 = Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entiled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted. The ESLs used for this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water. The ESL document catogorizes TPH as either gasoline, middle distillates, or residual fuels. "Middle distillates" are considered to include diesel fuel, kerosene, stoddard solvent, heating fuel, and jet fuel, whereas "residual fuels" include fuel oil (bunker fuel), lubricating oils (motor oil, oil and grease, waste oils) and asphalts.

ND = Not Detected at or above the laboratory RL.

BOLD = Analytical results above ESL or CA Low-Threat Closure Soil Screening Level

Table 3: Soil Surface Sample Results, July 12, 2013
Lead and Asbestos Analysis
14905 Santa Teresa Boulevard, Fremont, California

All soil results are in parts per million (mg/kg).

Sample Information			Lead (by EPA Method 6010B)	Asbestos* (by EPA Method 600/R-93/116)
Sample ID#	Sample Type	Depth (inches below ground surface)		
LA-1	Surface Grab Sample	3"	**150**	None Detected
LA-2	Surface Grab Sample	3"	31	None Detected
LA-3	Surface Grab Sample	3"	**86**	None Detected
LA-4	Surface Grab Sample	3"	56	None Detected
LA-5	Surface Grab Sample	3"	37	None Detected
LA-6	Surface Grab Sample	3"	**85**	None Detected
LA-7	Surface Grab Sample	3"	56	None Detected
LA-8	Surface Grab Sample	3"	13	None Detected
Laboratory Reporting Limit (RL):			20	--
Environmental Screening Levels [1] Screening Levels Residential / Industrial for SHALLOW Soils (<3m)			**80 / 320**	--
CHHSLs [2] Screening Levels Residential / Industrial			**80 / 3,500**	--

Notes

1 = Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entiled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (interim Final, November 2007, Revised February 2013). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted. The ESLs used for this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water. The ESL document catogorizes TPH as either gasoline, middle distillates, or residual fuels. "Middle distillates" are considered to include diesel fuel, kerosene, stoddard solvent, heating fuel, and jet fuel, whereas "residual fuels" include fuel oil (bunker fuel), lubricating oils (motor oil, oil and grease, waste oils) and asphalts.

2 = California Human Health Screening Levels for Soil (CHHSLs): The California Human Health Screening Levels are concentrations of 54 Hazardous Chemicals in soil or soil gas that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

ND = Not Detected at or above the laboratory RL.

< # = Reporting limit elevated due to laboratory sample dilution. Value reported as less than elevated laboratory reporting limit, X.

BOLD = Analytical results above CHHSL or ESL

* = EPA Method 600/R-93/116 is a qualitative detection method

Table 4: Summary of Soil Vapor Sample Analytical Results - July 12, 2013
Morgan Hill Ag ESA Phase II
14905 Santa Teresa Blvd, Morgan Hill
All results are in ug/m³

Sample ID	Sample Depth (feet, bgs)	Toxic Organics (TO - 3) in Air	Toxic Organics (TO - 15) in Air								Leak Trace Compound Monitoring		
		Total Petroleum Hydrocarbons as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes m,p	Xylenes o	MTBE	TBA	Other VOCs	Average Shroud Concentration as % (Field Measurement)	Summa Canister Helium as % (Laboratory Results)	% Sample Leakage
SV-1	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.5	0.20	0.9
SV-2	5'	550*	4.64	ND	4.90	ND	ND	ND	ND	ND	22.8	1.20	5.3
SV-3	5'	160*	ND	ND	ND	ND	ND	ND	ND	ND	24.7	0.95	3.8
SV-4	5'	220*	3.22	2.21	5.43	ND	ND	ND	ND	ND	28.4	2.40	8.5
Laboratory Reporting Limit (RL):		57	1.6	1.9	2.2	4.3	2.2	1.8	8.4	varies	--	--	--
CHHSLs (1) Screening Levels Residential / Commercial		--	36.2 / 122	135,000 / 378,000	--	315,000/ 879,000		4,000 / 13,400	--	varies	--	--	--
Environmental Screening Levels Residential & Commercial (ESLs) (2)		370,000 / 3,100,000	42 / 420	160,000 / 1,300,000	490 / 4,900	52,000 / 440,000		4,700 / 47,000	--	varies	--	--	--

Notes:

1 = California Human Health Screening Levels for Indoor air and soil gas (CHHSLs): The California Human Health Screening Levels are concentrations of 54 Hazardous Chemicals in soil or soil gas that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health. The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA.

2 = Environmental Screening Levels (ESLs): from Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final, November 2007 - revised February 2013), California Regional Water Quality Control Board - San Francisco Bay Region. The ESLs are intended to provide guidance on whether remediation of detected contamination is warranted. The ESLs used for this table were obtained from Table E., Indoor Air and Soil Gas (Vapor Intrusion Concerns) Screening Levels.

Residential / Commercial = **LTSGC, CHHSLs & ESLs for Residential or Commercial land uses**: ESL screening limit concentrations are presented in BROWN for Residential land uses and in GREEN for Commercial/Industrial land uses. A single number indicates the ESL is the same concentration for both Residential and Commercial land uses.

VOCs = Volatile Organic Compounds
ug/m³ = micrograms per cubic meter (parts per billion, ppb)
bgs = below ground surface
MTBE = Methyl Tert Butyl Ether
TBA = Tert Butanol
< # = Analyte not-detected at or above the elevated laboratory reporting limit. Reporting limit elevated due to laboratory sample dilution; results presnted as less than the Method Detection Limit (MDL)

J = Laboratory reports the result is a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather than quantitative.
* = Does not match pattern of reference Gasoline standard. Hydrocarbons in the range of C5-C12 quantified as Gasoline.

Table 5: Grab Groundwater Results, July 12, 2013
Total Petroleum Hydrocarbons and Volatile Organic Analysis
14905 Santa Teresa Boulevard, Morgan Hill, California

All grab groundwater results are in ug/L

Sample Information			Total Petroleum Hydrocarbons		Volatile Organic Analysis by EPA #8260				
Sample ID#	Depth to Groundwater* (feet)	Temporary Screen Interval	Diesel (by EPA #8015B)	Gasoline (by Luft/GC/MS)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
DP-1	15.4'	22-32'	ND	ND	ND	ND	ND	ND	ND
DP-2	12.3'	15-25'	ND	ND	0.17 J	0.15 J	ND	ND	ND
DP-3**	12.3'	14-18'	ND	ND	ND	ND	ND	ND	ND
DP-4**	16.6'	14-18'	ND	ND	ND	ND	ND	ND	ND
Laboratory Reporting Limit (RL):			**40**	**50**	**0.50**	**0.50**	**0.50**	**1.0**	**0.50**
Central Coast Region Water Quality Goals (WQG)[1]:			**1,000**	**1,000**	**1**	**150**	**300**	**1,750**	**5**

Notes

1 = Water Quality Goals: Goals establised by the CRWQCB Central Coast Region based on Maximum Contaminant Limits (Department of Health Services) or taste & odor threshold limits.

ND = Not Detected at or above the laboratory RL.

< # = Reporting limit elevated due to laboratory sample dilution. Value reported as less than elevated laboratory reporting limit, X.

J = Indicates a value between the MDL and PQL and that the reported concentration should be considered as estimated rather than quantitative.

BOLD = Analytical results above ESL or CA Low-Threat Closure Soil Screening Level

***** = Not necessarily stabilized Depth to Groundwater

****** = Total boring depth for DP-3 and DP-4 was to 24' and 32' bgs, respectively

APPENDIX A

COLLECTED *PHASE I ESA* INFORMATION

- Site Inspection Checklist with Photo Sheet
- Land Use Questionnaire
- Interviewing Documentation

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

Phase I Environmental Site Assessment
Site Inspection Checklist

Objective: To visually evaluate and document the extent of the target property(ies) for the likely presence of *recognized environmental conditions.*

Site/Facility Name: Former Ruth Jones Property / Christmas Tree Farm

Site Address: 14905 Santa Teresa Blvd, Morgan Hill [779-02-023]

Site Contact: Doug Blackwell, (408) 892-8345

1. **Current Uses of the Property:** *To include (1) general description of the facility & commercial or industrial processes therein, (2) topography, (3) site improvements [# of buildings, size/age/condition], (4) occupants/vacancies and the nature of business operations, and (5) any indications of past site use.*

The Site is an approximately 18-acre agricultural property, with a dilapidated barn, one house and an adjoining garage present. The remainder of the Site is sporadic and at times densely vegetated, with patches of the former christmas trees and orchards, along with invading plant species. Site topography is generally flat, however a large, inclined man-made hill is present in the northwestern portion of the property, possibly used to elevate farm equipment and materials above flood level.

The one-story, wooden barn structure was built prior to 1917 (present in topographic maps) in conjunction with agricultural activities at the site. The barn is currently unused, and is in disrepair with refuse throughout. There is no evidence of current chemical storage within the barn area. There are some tools and agricultural equipment remnants of the Christmas tree farm operations which were conducted on the Site by previous owners.

The residence and associated garage were built some time in the early 1960s (aerial photographs). The house and garage are in good condition and are well maintained. There is no evidence of chemical storage associated with these structures, aside from basic household fuel and chemical storage for automotive and property maintenance.

2. **Site Infrastructure:**	Yes	No	Notes:
• Any wells, water tanks or water towers?	☑	☐	
• Bioler rooms?	☐	☑	
• Electrical transformers?	☐	☑	
• Septic System?	☐	☐	
• Drainage wells or dry wells?	☐	☑	

Note observations and data for heating sources, water supply source(s), solid waste disposal and electrical systems.

A single water supply well is present on-Site that was installed in the late 1990s. This well replaced a pre-existing well that was used for agricultural purposes. The current well produces potable water for the single-family residence.

3. **Evidence of Hazardous Materials Storage & Use** *(check appropriate):*

	Yes	No
• Haz-mat storage area(s)? Location?	☐	☑
• Abandoned drums or containers?	☑	☐
• Aboveground Storage Tanks?	☐	☑
• Underground Storage Tanks?	☐	☑
• Fuel or Chemical Dispensing Equipment or vent piping?	☐	☑
• Pools of liquid? Characteristics?	☐	☑
• Sumps, oil/water separators and collection pits?	☐	☑
• Unusual Odors, staining or distressed vegetation?	☐	☑

The former UST and AST were removed from the Site in 1997. Only small quantities of fuels and chemicals are present in the garage adjoining the residential dwelling.

HAZMAT CONTINUED:

4. Exterior Observations:

	Yes	No
• Exterior surface coverings? *(describe condition, type, % native soils)*	☐	☑
• Paving patches/staining?	☐	☑
• Manholes/utility covers?	☐	☑
• Any stacks or HVAC units visible on roof?	☐	☑
• Mounds or depressions?	☑	☐
• Do surface water catch basins drain?	☐	☐
• Any ditches or drainages? *(If flow is present, identify the source)*	☑	☐

A large, inclined man-made hill is present in the northwestern portion of the property, possibly used to elevate farm equipment and materials above flood level. Llagas Creek (Coyote Creek) runs along the southeastern border of the property, flowing east-northeast.

5. **Interior Observations:**	Yes	No
• Maintenance Areas	☐	☑
• Hydraulic Equipment	☐	☑
• Interior Floor Staining or Patching?	☐	☑
• Interior Floor Drains? Outlet Sump?	☐	☑
• Interior Floor Integrity (good, satisfactory, poor)?	☐	☐

The interior of the barn had a large quantity of refuse and pieces of the structure. No drains were observed. The barn's floor are wooden.

6. Describe Adjoining Site Land Uses and Note Any Areas of Concern:

Northeast (down-gradient lands): Santa Teresa Blvd and residential neighborhoods.

Northwest (side-gradient lands): Watsonville Road, low density residences.

Southwest (up-gradient lands): Low density residential.

Southeast (side-gradient lands): Coyote Creek (Llagas Creek) and open space.

7. Any inaccessible Areas of the Property:

No

ADDITIONAL INFORMATION OBTAINED & UTILIZED DURING SITE INSPECTION

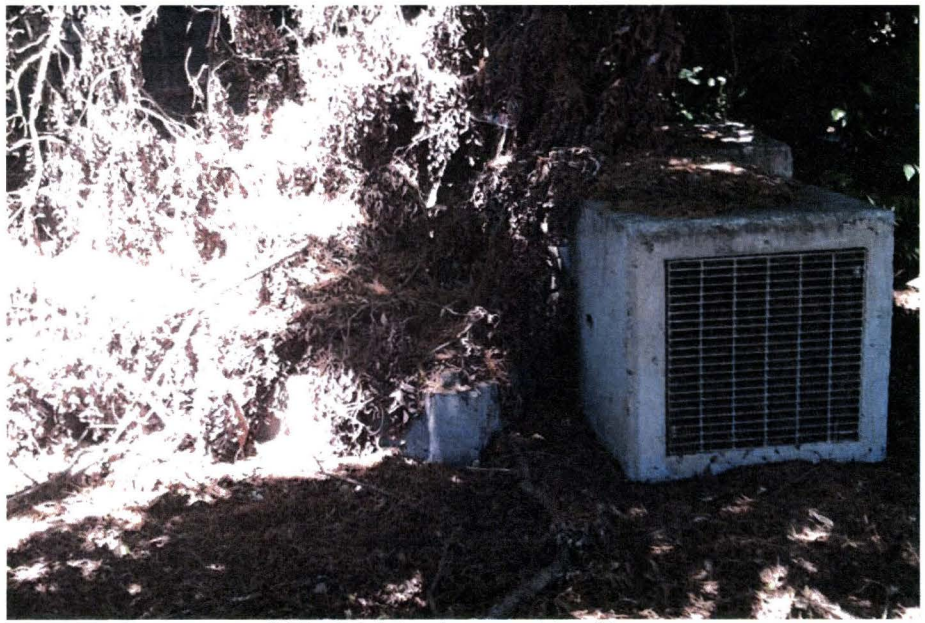
	Yes	No
Photo Sheets	☑	☐
Hazardous Materials Management Plans (HMMP)	☐	☑
Permits	☐	☑
Previous Reports/Inspections	☑	☐
Other	☐	☑

001. Inside barn

002. Inside barn

003. Inside barn

004. Side of barn



005. Catch basin near side of barn

006. Inside barn

007. Inside barn

008. Facing north from eastern portion of site

009. Domestic water supply well and tank

010. Driveway - facing southwest

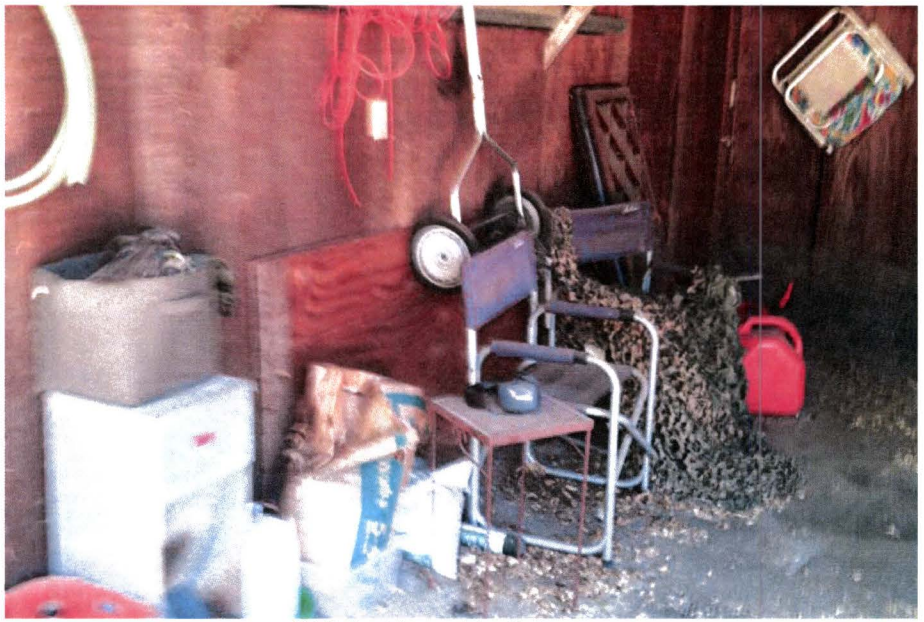
011. Driveway entrance

012. Hoist next to trailer

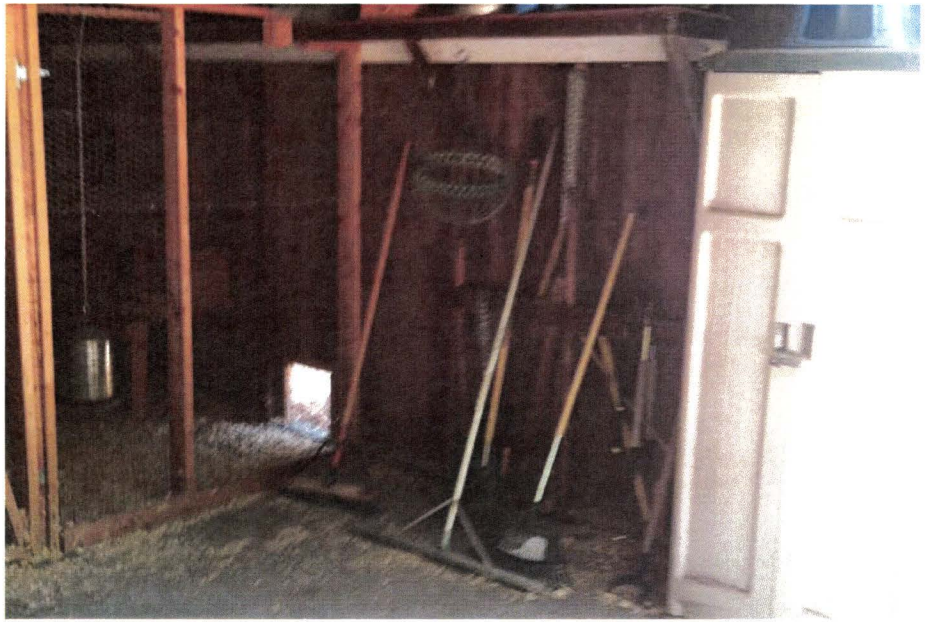
013. Mature orchards, Christmas trees

014. Farm equipment - disk

015. Tractor next to residential unit



016. Inside residential garage



017. Inside residential garage

018. Old irrigation piping next to garage

019. Piles of tree cuttings throughout

020. Ramped mound in northwest portion of site

021. Christmas trees and central access road

022. Facing southwest along Watsonville Road

023. Facing northeast along Watsonville Road

024. Upgradient property across Watsonville Road

025. Vineyard across Watsonville Road

026. Intersection of Watsonville Road and Santa Teresa Blvd

Appendix H

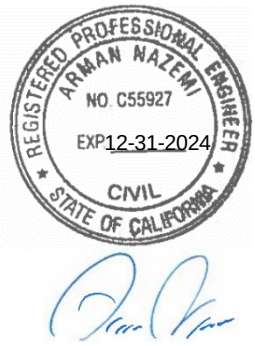
Stormwater Control Plan

Stormwater Control Plan

for

BLACKROCK- Quail Vineyard
Southerly quadrant of the Watsonville Road and Santa Teresa Blvd. Intersection
Morgan Hill, CA

January 13, 2023
Revised Date: May 22, 2023



Blackrock LLC, Owner
Rocke Garcia, Legally Responsible Party
2730 Lone Oak Court
Gilroy, CA 95020
glenrockdevel@gmail.com
408-892-8345

Prepared by:

Arman Nazemi, PE
MH engineering Co.
16075 Vineyard Blvd, Morgan Hill, CA 95037
408.779.7381
arman@mhengineering.com

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D. LID Retention Volume Sizing Calculations
E. NOAA Rainfall Data
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J. Operation and Maintenance Plans
K. Operation & Inspection Logs, Form, & Checklists
L. BMP RAM Field Protocols
M. City of Morgan Hill Municipal Code Chapter 18.71

I. Project Data

I.A. Purpose of the Report

The general purpose of this Stormwater Control Plan (SWCP) is to demonstrate compliance with the Central Coast Regional Water Quality Control Board's (CCRWQCB) Post-Construction Stormwater Compliance Resolution R3-2013-0032 and the Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara.

All new construction and redevelopment projects are required to comply with these regulations if they create and/or replace at least 2,500 square feet of impervious area. The requirements are designed preserve the health of watersheds that may be impacted by the improvement of the subject property. Developments are encouraged to maximize the use of Low Impact Development (LID) techniques and incorporate as many Stormwater Control Measures (SCM) and Best Management Practices (BMP) as possible to reduce contaminants leaving the site and affecting downstream water bodies. A Stormwater Control Plan prepared by, or under the direction of, a Professional Civil Engineer is required to detail the potential impacts and mitigation measures implemented by the project.

Table 1: Project Data Summary

Project Name/Number	25268.2
Application Submittal Date	5/22/2023
Project Location	
Project Phase	N/A
Project Type and Description	Residential
Total Project Area	683,476
Total New Impervious Area	186,920
Total Replaced Impervious Area	186,920
Total Pre-Project Impervious Area	0
Total Post-Project Impervious Area	186,920
Net Impervious Area	186,920
Watershed Management Zone	1
Design Storm Frequency	95th Percentile
Design Storm Depth	1.85

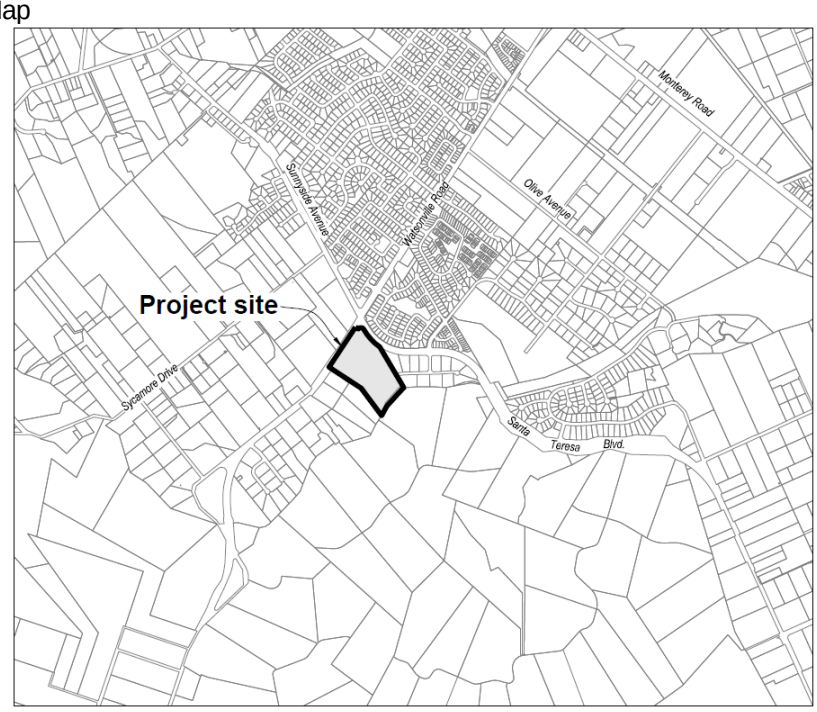
II. Setting

II.A. Project Location and Description

The project is located in Morgan Hill at southerly quadrant of Santa Teresa Blvd. and Watsonville Road intersection in Residential Planned Development RPD zoning. The project proposes 14 detached residential lots on 683,476 square foot of buildable area. The parcel has frontage along the Llagas Creek with adequate setback designated for flood way. Due to larger footprint of each lot, the site is divided into 30 separate Drainage Management Area, DMAs. Each DMA is provided along the side yards and backyards with a bio-swales with detention facility. Due to lack of infiltration along with lack of a minimum 10 feet separation to high seasonal ground water (water table is found within 8 to 10 feet from the surface per Earth System soil report), the project falls under technical infeasibility. As a result the drainage design is based on providing quality treatment for 10 percent equivalent impervious surface area in compliance with C3 stormwater guidelines. Each lot is proposed to designate bio-swales treatment area for a minimum of 10 percent equivalent impervious surface areas. The site will detain excess surface runoff due to new development within bio-swale areas and after processing quality treatment it will release it at less than or equal to pre-development level in compliance with hydro-modification

requirements for all storms up to 100 year event. Furthermore; in order to size the required detention facilities an additional 74,538 sf of hardscape assumption was distributed among all lots proportion to the lot size. This is in addition to proposed hard surfaces depicted on the proposed tentative improvement plans that includes, building site, driveways, sidewalk, road frontage and internal streets improvements. This conservative assumption was to account for future home improvements within their lot which may not require going through permitting requirements. The excess runoff during the peak of the storm will be captured, detained and conveyed through 18 “storm drain pipe that discharges into the existing 60” diameter public storm drain system that flows to the Llagas Creek. This project falls within Central Coast region 3 part of the Monterey Watershed.

Figure 1: Vicinity Map



II.B. Existing Site Features and Conditions

The proposed site is generally flat with gentle slope toward the creek. All parcels have independent storm drainage systems that mitigate drainage impact due to development in terms of hydro modification limiting post development to pre-development level for all storm events. The excess runoff from each parcel will be discharged into a public storm drain system that ultimately drains to Llagas Creek fronting the project site via an existing 60” storm drain.

II.C. Opportunities and Constraints for Stormwater Control

II.C.1. Opportunities.

Opportunities for stormwater control include measures such as limiting disturbance of natural drainage features, permeable soils, or native vegetation; minimizing impervious areas; routing runoff through vegetation; and use of permeable surfaces such as pavers. Opportunities presented and implemented by this site include:

The bio-retention facility not only provide quality treatment for up to 10 percent of impervious area but also comply with hydromodification.

II.C.2. Constraints
Stormwater Control Constraints include site conditions such as impermeable soils, high groundwater, groundwater and/or soil contamination, geotechnical hazards, project density, or high-intensity land use. Constraints presented by this project include:

The site infiltration is very low to zero due to presence of clayey soil. The combination of both very low infiltration and presence of high seasonal ground water found within 12 feet of the ground surface the project falls within technically infeasible site. We have applied 10 percent equivalent surface areas for quality treatment and hydromodifications per the Central Coast Region 3 stormwater guidelines.

III. Low Impact Development Design Strategies

III.A. Performance Requirements

The CCRWQCB Resolution R3-2013-0032 as well as the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* describe levels of Post-Construction Requirements based upon the amount of impervious area created/replaced. Below is a discussion of each of the performance requirements and mitigation measures intended to comply with each Performance Requirement Tier.

III.A.1. Performance Requirement No. 1 (PR-1): Site Design and Runoff Reduction
Development projects that create and/or replace at least 2,500 square feet of impervious areas are subject to PR-1. PR-1 requires the following:

- Limit Disturbance of creeks and natural drainage features
- Limit disturbance of highly permeable soils
- Limit disturbance of native vegetation
- Minimize creation and/or replacement of impervious areas
- Minimize runoff using:
    - Cisterns or rain barrels for reuse
    - Route runoff through vegetation
    - Use of permeable pavements

The project is optimized to minimize the ground disturbance to extend possible. The project provide adequate setback to prevent any disturbance to the Llagas Creek.

III.A.2. Performance Requirement No. 2 (PR-2): Water Quality Treatment
Development projects that create and/or replace at least 5,000 square feet (15,000 square feet for Single-Family Detached Homes) Net Impervious Area are subject to PR-2 in addition to PR-1. Net Impervious Area credits apply when the Post-Development Impervious Area is less than Pre-Development Conditions and is calculated below:

Net Impervious Area=(Total Post Development Impervious Area)-(Reduced Impervious Area Credit)

Where

Reduced Impervious Area Credit =
(Total Pre-Development Impervious Area) – (Total Post-Development Impervious Area)

Projects subject to the requirements of PR-2 are responsible for treating any contaminants that are created by the development. Table 2 below corresponds to Table 4 in *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* and is listed in order of preference according to said manual.

Table 2: Water Quality Treatment Measures Design Criteria (Guidance Manual Table 4)

Water Quality Treatment Measure*	**Design Criteria**
LID Treatment System – *Harvesting and use, infiltration, evapotranspiration, and bioretention (without an underdrain) SCMs*	Retain stormwater from the 85th Percentile 24-hour storm event (based on local rainfall data)
Biofiltration Treatment System – *Bioretention with raised underdrain, or other facilities at least as effective as a system with the specified design criteria.*	Design of rain event of 0.2 in/hr intensity or 2 x 85th percentile hourly rainfall intensity or other specified design criteria include: • Maximum surface loading rate of 5 in/hr • Minimum surface reservoir depth (6") • Minimum planting minimum depth (24") • Proper plant selection • Subsurface gravel layer (minimum depth of 12") • Underdrain placement near the top of the gravel layer • No compaction of soils beneath the facility • No liners preventing infiltration
Non-Retention Based Treatment Systems – *Lined bioretention, flow-through planters, and high rate tree well filters and media filters*	Volume Hydraulic Design Basis: 85th Percentile 24-hour storm event Flow Hydraulic Design Basis: 0.2 in/hr intensity OR 2 x 85th Percentile hourly rainfall intensity
*Multiple SCMs may be used to collectively achieve the design criteria.	

This project utilizes the proposed bio-swales for Quality Treatment and utilizing surface pond and bio-swale for detention and hydro-modifications. This system uses biofiltration media and special plant selection to break down contaminants in the water before entering the underground storage system. Figure 2 below shows a typical bioswale detail. The simplified sizing method (utilizing the 10% equivalent Impervious surface areas sizing method) was used to size these biofiltration systems. Figure 3 below shows simplified sizing methodology per the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* and Table 3 below show the sizing of each of the biofiltration SCMs.

Figure 2: Typical Bioswale Detail

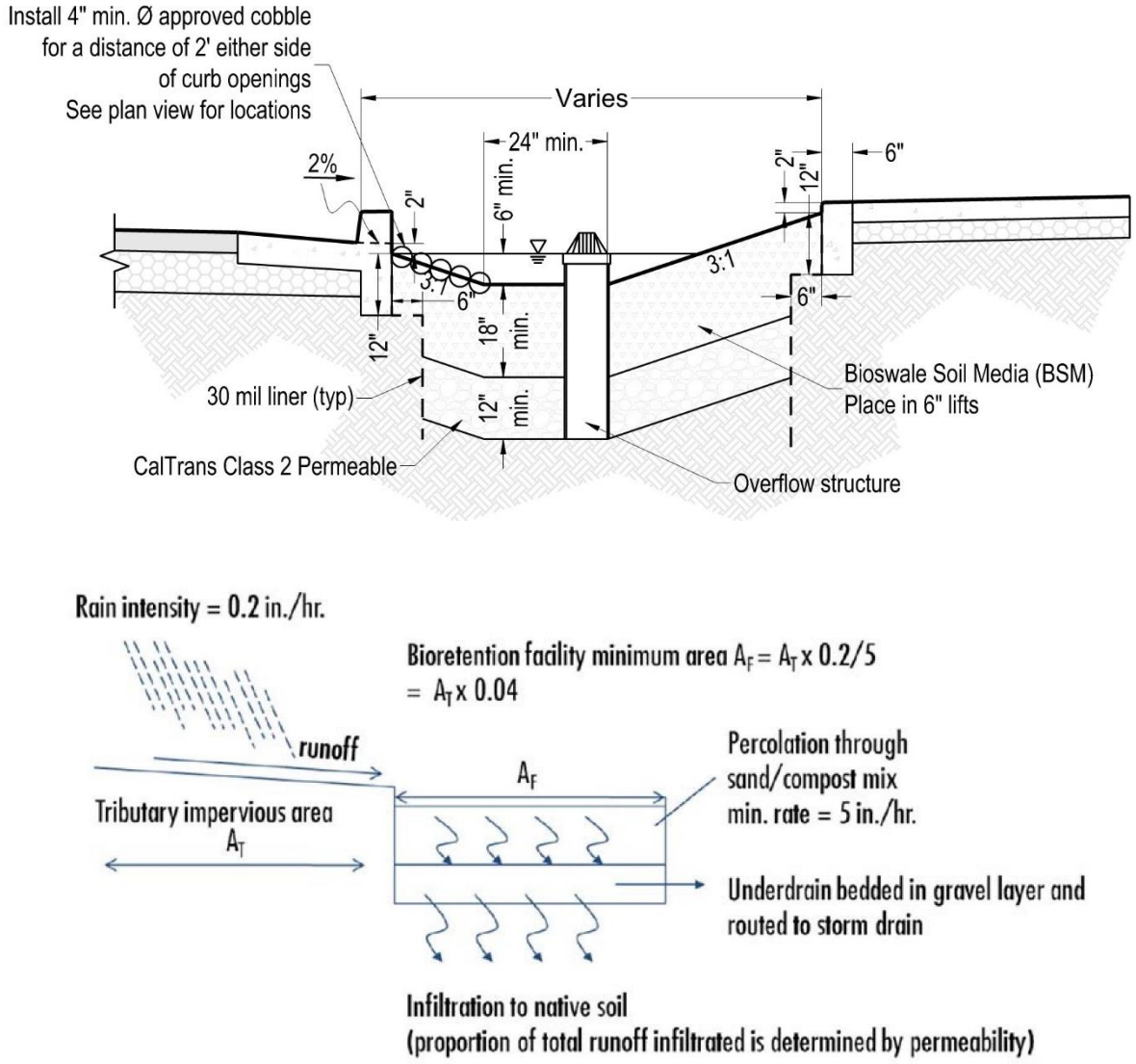


Table 3: LID Treatment Sizing Summary

Note: Not applicable due to technical infeasible site condition.

III.A.3. Performance Requirement No. 3 (PR-3): Runoff Retention

Development projects that create and/or replace 15,000 square feet of impervious area (Single Family Detached Homes are allowed to use Net Impervious Area as defined in PR-2) and are located within Watershed Management Zones 1, 2, 5, 6, 8, 9, and portions of Watershed Management Zones 4, 7, and 10 that lie in designated Groundwater Basins are subject to Performance Requirement 3 as we well as PR-1 and PR-2. PR-3 requires the retention of the volume of runoff that could contain contaminants and that would naturally infiltrate in pre-development conditions. Appendix D of the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of*

Gilroy, City of Morgan Hill and County of Santa Clara details the calculations for the required retention volume. Attachment E has detailed calculations for this project following the calculations in Appendix D of said Guidance Manual and is summarized below in Table 4 below.

Table 4: LID Volume Sizing Table

Note: Not applicable due to technical infeasible site condition.

This retains the required retention volume as calculated in Attachment E using an above ground retention/detention pond. The retention/detention ponds are placed at placed at the lowest point on site to conform to existing terrain and watersheds with a bottom elevation of subject lot. The pond releases via a stand pipe to retain the required retention volume. This elevation was determined by modeling the 95th percentile storm event in HydroCAD and placing the invert of the outfall just above the water surface elevation determined by the model storm. This ensures no release of the 95th Percentile Event as required by the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* continuous simulation of hydrologic model. This volume will be retained on site and will be infiltrated into the native soil beneath the pond. Utilizing an infiltration rate of 0.19 inches per hour with a factor of safety of 2 included, the system will drain within 72 hours. See Attachment B for location and details.

III.A.4. Performance Requirement No. 4 (PR-4): Peak Management
Development Projects that create and/or replace at least 22,500 square feet of impervious areas and within Watershed Management Zones 1, 2, 3, 6, and 9 are required to comply with Performance Requirement 4 in addition to previously discussed performance requirements. PR-4 is intended to mitigate the increased runoff created by the project's increase in impervious areas, thus preventing any adverse flooding conditions downstream of the project. PR-4 requires developments to detain increased runoff from the 2, 5, and 10 year events such that they release at rates at, or below, pre-development conditions.

This retains the required retention volume as calculated in Attachment E using an above ground bio-retention/detention pond. The bio-retention/detention pond is placed at placed at the lowest point on site to conform to existing terrain and watersheds. The pond releases via a stand pipe to retain the required retention volume. Outfall elevation and size has been designed to meter the outflow from the project at, or below, pre-development conditions up to the 100-year event. See Section IV below for detailed description of model and results.

III.A.5. Performance Requirement No. 5 (PR-5): Special Circumstances
This Performance Requirement applies to projects that are exempt from the runoff retention and/or peak flow mitigation requirements described in previous performance requirements because they discharge to highly altered channels, flow control facilities, or historic lake and wetland areas.

This project does not fall under this performance requirement.

IV. Documentation of Drainage Design

IV.A. Drainage Management Area Characterization

The Drainage Management Areas (DMAs) shown on Attachment C have been delineated based upon the tributary areas to each Source Control Measure (SCM). The site is comprised of 28 DMAs and SCM that it drains to storm drain that ultimately drains to Llagas Creek. Table 4 below shows a summary of each of the DMAs. See Attachment C for details.

Table 5: DMA Summary Table

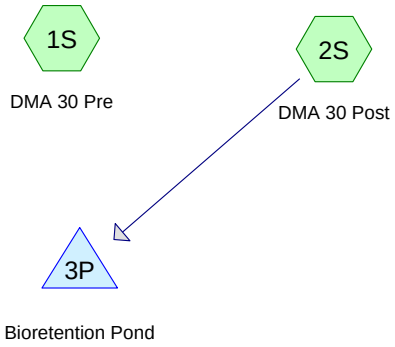
DMA	Total DMA Area (SF)	Impervious Area				EISA (SF)	Required Treatment Area (SF)	Provided Treatment Area (SF)
		Roof (SF)	PCC (SF)	AC (SF)	Landscape (SF)			
		CF: 1.00	CF: 1.00	CF: 1.00	CF: 0.10			
1	42,819	1,538	9,432	11,829	20,021	24,801	2,242	2,385
2	21,606	1,739	3,760	0	16,107	7,110	643	680
3	23,914	2,788	3,250	0	17,876	7,826	711	720
4	19,428	469	4,546	0	14,413	6,456	586	600
5	21,606	2,662	3,369	0	15,575	7,589	681	780
6	21,301	626	4,120	0	16,555	6,402	576	640
7	18,121	1,609	4,098	0	12,414	6,948	631	640
8	43,516	2,690	8,534	9,343	22,950	22,862	2,065	2,210
9	39,030	4,704	5,030	0	29,296	12,663	1,147	1,190
10	17,468	0	5,203	3,900	8,365	9,939	892	1,020
11	17,206	2,377	3,756	3,928	7,145	10,775	973	1,050
12	15,333	2,767	3,766	0	8,801	7,413	666	750
13	6,752	1,823	1,136	0	3,793	3,338	298	360
14	11,326	1,308	2,070	0	7,948	4,172	371	460
15	26,528	926	5,247	0	20,355	8,209	741	800
16	20,473	2,416	2,711	0	15,346	6,662	598	680
17	16,814	1,910	2,168	0	12,736	5,352	475	600
18	26,571	3,428	5,054	0	18,089	10,291	929	1,000
19	37,462	1,641	8,610	12,356	14,855	24,093	2,184	2,250
20	21,127	2,991	4,403	0	13,733	8,767	789	875
21	26,310	3,523	3,831	0	18,956	9,249	840	850
22	18,513	1,621	5,292	0	11,600	8,073	732	750
23	23,435	2,748	6,471	0	14,216	10,641	964	1,000
24	20,473	1,551	2,617	0	16,305	5,799	524	560
25	21,127	1,334	2,807	0	16,986	5,840	526	580
26	22,520	1,719	4,387	0	16,415	7,747	711	640
27	20,952	878	4,487	0	15,588	6,923	636	560
28	46,939	1,882	10,870	16,407	17,780	30,937	2,809	2,850
29	11,674	512	2,683	3,850	4,629	7,508	681	700
30	12,866	583	3,367	5,082	3,834	9,415	847	950

IV.B. Hydrologic Modeling

Hydrologic modeling has been completed utilizing the HydroCAD program. This program uses the SCS Unit Hydrograph method to route the design storms through the proposed SCMs to determine the runoff impact generated by the project. The model utilizes a unit hydrograph of Valley Water's Santa Clara Valley 1956 design storm combined with rainfall depths determined by the National Oceanic and Atmospheric Administration (NOAA). This rainfall data has been determined to be more conservative and provide the

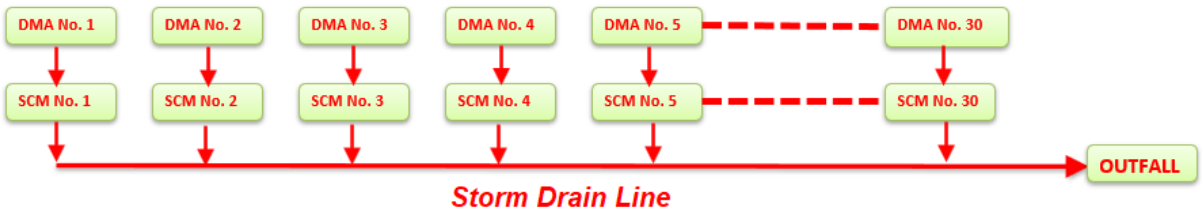
worst-case scenario when determining hydrologic impact of the development. Figure 4 below shows a schematic of the model created in HydroCAD. Detail input and output data can be found in Attachment F.

Table 6: HydroCAD Model Schematic



Note: The schematics above is similar for all 30 DMAs.

Figure 3: Stormwater Modeling Schematic



This retains the required retention volume as calculated in Attachment E using an above ground retention/detention pond. The bio- retention/detention pond is placed at placed at the lowest point on site to conform to existing terrain and watersheds. The pond releases via a stand pipe to retain the required retention volume. Once filled, the system will continue to detain the increased runoff with the provided storage and metered outfall such that release from the site is at, or below, pre-development levels up to the 100-year event per the City of Morgan Hill Drainage Ordinance.

In addition to the outfall mentioned above, infiltration has been modeled out of the system using the infiltration report mentioned in [Geotechnical Report Information]. A factor of safety of 2 has been applied to this infiltration and modeled as “Discarded” in the HydroCAD model. This is the water that will infiltrate into the native soil during the modeling window. HydroCAD modeling shows that with this infiltration rate included in the system, 95th Percentile below the outlet elevation. Using the factored infiltration rate in the HydroCAD model, retained runoff in the surface pond will be fully infiltrated within 72 hours after storm.

The maximum water surface elevation in the system for the event has been determined to be 100-year event. The system is designed to detain the 100-year event; however overland release has been provided to pre-development level. This system would only be used in the event of failure of the outfall system of collection pipes. Tables 6 & 7 below show a summary typical for each event. See Attachment G for detailed model input and output data.

Table 7: Typical Pre-Development Runoff Summary (DMA No. 30)

Events for Subcatchment 1S: DMA 30 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.03	0.012	0.47
2 year	2.90	0.06	0.029	1.18
5 year	3.84	0.10	0.047	1.91
10 year	4.62	0.13	0.063	2.56
25 year	5.72	0.17	0.087	3.53
50 year	6.59	0.20	0.106	4.32
100 year	**7.49**	**0.23**	**0.127**	**5.15**

Table 8: Typical SCM Runoff Summary (DMA No. 30)

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.05	0.03	0.03	**0.00**	336.97	98
2 year	0.09	0.06	0.06	0.00	337.32	231
5 year	0.12	0.10	0.10	0.00	337.63	351
10 year	0.15	0.12	0.12	0.00	337.82	423
25 year	0.19	0.15	0.15	0.00	338.10	527
50 year	0.23	0.17	0.17	0.00	338.34	621
100 year	**0.26**	**0.19**	**0.19**	0.00	**338.63**	**728**

Inflow = Post-Development peak runoff flow entering the SCM
Outflow = Total outflow from the SCM, including infiltration and overflow
Discarded = Runoff leaving the system via infiltration using the factored infiltration rate
Primary = Ruoff leaving the system and into the public storm drain system
Tertiary = Pond overtopping
Elevation = Maximum water surface elevation during the storm event

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

Common sources of potential pollutants in residential projects include pesticides/herbicides from landscape maintenance, fertilizers, oil/fuel leaking from poor vehicle maintenance, and airborne contaminants settling on the site.

V.B. Source Control Table

Table 9: Potential Pollutants and Source Control BMPs

	Pollutants Associated with Activity						
Potential Pollutant Source	Sediment/ Litter/ Debris	Nutrients/ Organic Matter	Bacteria	Hydro-carbons	Toxics/ Chemicals/ Paint	Other	Source Control BMP Proposed
Pets		X	X				Good housekeeping/ Illicit Discharge Control/Pet Waste Station
Parked Vehicles	X			X			Vehicle Maintenance, Fueling and Storage
Roads, Fertilizers, Pesticides, Storm Drains, Etc.	X			X	X		Plant Selection and integrated pest management

Table 10: Source Control Measures

Source Control Measure	Description
Storm Drain Inlets	Structural: Inlets clearly marked with “No Dumping” or similar message Operational: Inlets will have routine inspection and cleaning.
Pesticides	Structural: Pest-resistant plans will be selected when possible near impervious surfaces Operational: Landscape maintenance to utilize integrated pest management methods.
Bioswales	Operational: Bi-annual inspections required by the City to assess performance of the filtration media.
Underground Retention System	Structural: Installed sumps for sedimentation and ADS Envirohood for floating contaminants. Operational: Routine inspection and maintenance of sumps.

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

Structural Control Measures are facilities designed and implemented to contain and remove contaminants found in stormwater runoff generated from development. These facilities break down and remove contaminants using filtration, infiltration, sedimentation, and evapotranspiration on the site before releasing runoff from the site.

This project has installed biofiltration facilities for each DMA that will break down contaminants in runoff through the use of special sand and compost material that will filter contaminants in the runoff. These biofiltration facilities feature a special selection of plants that will break down contaminants such as oils and metals that enter the facility. Runoff will pass through the filtration media and enter the storm drain system via an underdrain and be routed to the retention facility to promote infiltration and further treatment of the runoff.

An ADS Envirohood (or approved equivalent) has been installed at the outlet control for the system to prevent any floating contaminants, such as oils, from leaving the site. This system functions such that the only way for water to leave via the outlet is under the surface of the water and creates a barrier for contaminants that float along the surface of the water from reaching the outlet pipe without compromising hydraulic capacity of the outlet. See Attachment B for location and details.

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

Project that trigger Performance Requirements 2, 3, or 4 are required to record a Stormwater Best Management Practices, Operation and Maintenance Agreement with the City of Morgan Hill and incorporate language into the CC&Rs accepting responsibility for inspection, operation, and maintenance of the stormwater structure control measures. Attachment H of this report is the Stormwater Best Management Practices, Operations and Maintenance Agreement demonstrating that Evergreen will be responsible for the structure control measures installed during this development. Legally Responsible Party Contact information provided below.

Blackrock LLC, Owner
Rocke Garcia, Legally Responsible Party
2730 Lone Oak Court
Gilroy, CA 95020
glenrockdevel@gmail.com
408-892-8345

Blackrock LLC will be required to enter into contract with a Third Party inspector to assess and recommend maintenance of the installed systems. Third Party Inspector is required to be a registered Civil Engineer by the State of California or a Qualified SWPPP Practitioner (QSP).

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

Table 11: Source Control Measure Maintenance Summary

Structure Control Measure	Maintenance
Biofiltration Facilities (bioswales)	Routine Inspection, Sediment monitoring, debris/trash cleaning, integrated pest management for planting.
Storm Drain Inlets	Routine inspection and cleaning.
Water Quality control Inlets/Outlets	Routine inspection and cleaning.

As stated in the *Stormwater Best Management Practices, Operation, and Maintenance Agreement*, the project shall submit two (2) annual inspections per year in perpetuity. One inspection is due every June and shall follow the instructions outlined in the *BMP RAM Field Protocols* (added as attachment). The second inspection shall be submitted every November and will include a certification from the Engineer or QSP verifying all SCM(s) are in working conditions. Maintenance shall be performed whenever the SCM(s) are in poor conditions as per the annual inspections, or regular maintenance.

VII. Construction Checklist

Table 12: Construction Checklist

SWCP Page No.	Structural Control Measure SCMs	Plan Sheet No.	SCM Detail No.

Attachment G	SCM 1-30	1-6	To be provided

VIII. Certifications

The design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the Post-Construction Stormwater Management Resolution R3-2013-0032 and the current edition of the City's LID and Post-Construction Requirements Handbook.

See Attachment G for Performance Requirement Certifications

Attachment A

Existing Site Condition

Attachment B

Performance Requirement Checklist

LOW IMPACT DEVELOPMENT

AND

POST-CONSTRUCTION

STORMWATER MANAGEMENT REQUIREMENTS

APPLICANT PACKET

FOR PROJECTS IN SOUTH SANTA CLARA COUNTY

COUNTY OF SANTA CLARA

REV 6/11/15

PROJECT INFORMATION

Project Name: Black Rock-Quail Vineyard APN#: 779-002-023

Project Address: Southerly quadrant of Watsonville Road and Santa Teresa Blvd. intersection

Cross Streets: Wasonville Road/ Santa Teresa Blvd. Intersection

Applicant/Developer Name: BLACKROCK LLC, 2730 Lone Oak Ct., Gilroy,CA 95020

Project Phase(s): 1 of 1 Engineer: Arman Nazemi, PE

Project Type (Check all that apply): ☐ New Development ☐ Redevelopment
☑ Residential ☐ Commercial ☐ Industrial ☐ Mixed Use ☐ Public ☐ Institutional
☐ Restaurant ☐ Uncovered Parking ☐ Retail Gas Outlet ☐ Auto Service (SIC code)____
☐ Other _____

Project Description: This is residential development comprising of 28 detached lots.

Project Watershed/Receiving Water (creek, river): Llagas creek

1. Total Project Area	683,476	ft²
2. Pre-Project		
(a) Impervious Area	0	ft²
(b) Pervious Area	683,476	ft²
3. Post-Project		
(a) Replaced Impervious Area	0	ft²
(b) New Impervious Area	186,920	ft²
(c) Total Post-Project Impervious Area (*sum of Line 3a and Line 3b*)	186,920	ft²
(d) Post-Project Pervious Area	496,556	ft²
Net Impervious Area		
4. Reduced Impervious Area Credit *(Line 2a minus Line 3c)*	0	ft²
5. Net Impervious Area *(Line 3c minus Line 4)*	186,920	ft²

6. Is Line 3c greater than or equal to 2,500 sq. ft?

☐ No, the project does not need to meet Post-Construction Stormwater Management Requirements **- STOP HERE**.

☑ Yes, the project is subject to Performance Requirement No. 1: Site Design and Runoff Reduction. Complete the **Site Design and Runoff Reduction Checklist** on **Page 4**. Continue to #7.

7. Is the Project a detached single-family home?

☐ No, go to #8.

☑ Yes, continue to #7.a. below.

7a. Is Line #5, Net Impervious Area greater than or equal to 15,000 sq ft?

☐ No, the project does not have any additional requirements – **STOP HERE**.

☑ Yes, this project is subject to Performance Requirement No. 2: Water Quality Treatment. Complete the **Water Quality Treatment Checklist** on **Page 6**. Continue to #7.b.

☑ Yes, this project is subject to Performance Requirement No. 3: Runoff Retention. Complete the **Runoff Retention Checklists** on **Pages 8-11**. Continue to #7.b.

7b. Is Line #3.c, amount of impervious surface created and/or replaced, greater than or equal to 22,500 sq ft?

☐ No, go to #12.

☑ Yes, this project is subject to Performance Requirement No. 4: Peak Management (refer to the Stormwater Management Guidance Manual for instructions).
Go to #12.

8. For projects that are not detached single family homes, is Line #5, Net Impervious Area, greater than or equal to 5,000 sq ft?

☐ No, the project does not have any additional requirements – **STOP HERE**.

☐ Yes, this project is subject to Performance Requirement No. 2 Water Quality Treatment. Complete the **Water Quality Treatment Checklist** on **Page 6**. Continue to #9.

9. Is Line #3.c, amount of impervious surface created and/or replaced, greater than or equal to 15,000 sq ft?

☐ No, go to #11.

☐ Yes, this project is subject to Performance Requirement No. 3 Runoff Retention. Complete all **Runoff Retention Checklists** on **Pages 8-11**, as applicable. Continue to #10.

10. Is Line #3.c, amount of impervious surface created and/or replaced, greater than or equal to 22,500 sq ft?

☐ No. Continue to #11.

☐ Yes, this project is subject to Performance Requirement No. 4: Peak Management (refer to the Stormwater Management Guidance Manual for instructions). Continue to #11.

11. Is there a pollutant generating activity or source included in the project (e.g., restaurants, grocery stores, food service operations, outdoor storage, vehicle service facilities, retail gas outlets, outdoor parking lots, loading docks, pools, spas, or fountains)?

☐ No, go to #12.

☐ Yes, your Project is required to implement structural or operational source control measures. Complete the **Source Control Checklist** on **page 5**. Continue to #12.

12. **Operation and Maintenance Information**

a) Property Owner's Name BLACKROCK LLC

b) Responsible Party for Stormwater Treatment/Hydromodification Control O&M:

i. Name: Rockie Garcia

ii. Address: 2730 Lone Oak Court, Gilroy CA 95020

iii. Phone/E-mail: 408-892-8345 / glenrockdevel@gmail.com

13. Submit a Stormwater Control Plan with the required information, and complete the **Stormwater Control Plan Checklist** on **page 12**.

☑ Yes

☐ No

 File No.:_____

PERFORMANCE REQUIREMENT NO. 1: SITE DESIGN AND RUNOFF REDUCTION

Certification

	DESIGN STRATEGY	INCORPORATED INTO PROJECT?
1.	Limit disturbance of creeks and natural drainage features.	X
2.	Minimize compaction of highly permeable soils.	X
3.	Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection.	
4.	Minimize impervious surfaces by concentrating improvements on the least sensitive areas of the site, while leaving the remaining land in a natural undisturbed state.	X
5.	Minimize stormwater runoff by implementing one or more of the following design measures:	
	a) Direct roof runoff into cisterns or rain barrels for reuse.	
	b) Direct roof runoff onto vegetated areas safely away from building foundations and footings.	
	c) Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas safely away from building foundations and footings.	
	d) Direct runoff from driveways and/or uncovered parking lots onto vegetated areas safely away from building foundations and footings.	
	e) Construct bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios with permeable surfaces.	

I, Arman Nazemi, PE, acting as the Project Engineer for Black Rock, Vineyard project, located at South Quadrant of Watsonville Road and Santa Teresa Blvd., hereby state that the Site Design and Runoff Reduction design strategies indicated above have been incorporated into the design of the project.

Arman Nazemi
Signature

May 1, 2023
Date

 File No.:_____

SOURCE CONTROL CHECKLIST

On-site Source Control Measures	**Incorporated Into Project?**
Wash area/racks, drain to sanitary sewer or septic system[1]	☐
Covered dumpster area, drain to sanitary sewer/septic system[1] or landscaped area	☐
Accessible cleanout for draining swimming pool/spa/fountain	☐
Parking garage floor drains plumbed to sanitary sewer[1]	☐
Fire sprinkler test water/condensate drain lines drain to sanitary sewer/septic system[1] or landscaped area	☐
Interior floor drains/boiler drain lines plumbed to sanitary sewer	☐
Beneficial landscaping/IPM (minimize irrigation, runoff, pesticides and fertilizers; promotes treatment)	☑
Outdoor material storage protection	☐
Covers, drains for loading docks, maintenance bays, fueling areas	☐
Maintenance (pavement sweeping, catch basin cleaning, good housekeeping)	☑
Storm drain labeling	☑
Other[2] _____	☐

Notes:

[1] Subject to sanitary sewer authority and/or Department of Environmental Health requirements.

[2] See CASQA Stormwater BMP Handbook for New Development and Redevelopment for additional BMPs for vehicle service repair facilities, fuel dispensing areas, industrial processes, rooftop equipment and other pollutant generating activities and sources. https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook

PERFORMANCE REQUIREMENT NO. 2: WATER QUALITY TREATMENT

Certification

ON-SITE WATER QUALITY TREATMENT MEASURES	INCORPORATED?
1. Low Impact Development (LID) Treatment Systems designed to retain stormwater runoff generated by the 85th percentile 24-hour storm. Stormwater Control Measures Implement (check all that apply, design documentation is required)	
a) Harvesting and Use,	☐
b) Infiltration,	☑
c) Evapotranspiration	☐
2. Biofiltration Treatment Systems[1] – with the following design parameters:	
a) Maximum surface loading rate appropriate to prevent erosion, scour and channeling within the biofiltration treatment system itself and equal to 5 inches per hour, based on the flow of runoff produced from a rain event equal to or at least: (a) 0.2 inches per hour intensity; or (b) Two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depth	☑
b) Minimum surface reservoir volume equal to the biofiltration treatment system surface area times a depth of 6 inches	☑
c) Minimum planting medium depth of 24 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used. A Project may utilize an alternative planting medium if it demonstrates its planting medium is equal to or more effective at attenuating pollutants than the specified planting medium mixture.	☑
d) Proper plant selection[2]	☑
e) Subsurface drainage/storage (gravel) layer with an area equal to the biofiltration treatment system surface area and having a minimum depth of 12 inches	☑
f) Underdrain with discharge elevation at top of gravel layer	☑
g) No compaction of soils beneath the biofiltration facility (ripping/loosening of soils required if compacted)	☑

h) No liners or other barriers interfering with infiltration, except for situations where lateral infiltration is not technically feasible ☑

3. Non-Retention Based Treatment Systems – designed to meet at least one of the following hydraulic sizing criteria:

   (a) Volume Hydraulic Design Basis – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to the volume of runoff generated by the 85th percentile 24-hour storm event, based on local rainfall data. ☑

   (b) Flow Hydraulic Design Basis – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat: ☑
      (i) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or
      (ii) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

I, Arman Nazemi, PE, acting as the Project Engineer for Black Rock-Quail Vineyard project, located at _____, hereby state that the Water Quality Treatment Measures indicated above have been incorporated into the design of the project.

arman nazemi _____ May 15, 2022

Signature Date

[1] Facilities or a combination of facilities, of a different design than in Item #2 may be permitted if all of the following measures of equivalent effectiveness are demonstrated: 1) equal or greater amount of runoff infiltrated or evapotranspired; 2) equal or lower pollutant concentrations in runoff that is discharged after biofiltration; 3) equal or greater protection against shock loading and spills; and 4) equal or greater accessibility and ease of inspection and maintenance.

[2] Technical guidance for designing bioretention facilities is available from the Central Coast LID Initiative. The guidance includes design specifications and plant lists appropriate for the Central Coast climate. (http://www.centralcoastlidi.org/Central_Coast_LIDI/LID_Structural_BMPs.html)

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

Design Rainfall Events & Treatment Requirements for Watershed Management Zones (WMZs)[1]

WMZ[2]	Treatment Options & Design Rainfall	Check Applicable WMZs
WMZ 1	Via optimized infiltration[3], prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.	☑
WMZ 2	Via storage, rainwater harvesting, infiltration, and/or evapotranspiration, prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WM 4 *	Via optimized infiltration[2], prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 5	Via optimized infiltration[2] prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 6	Via storage, rainwater harvesting, infiltration, and/or evapotranspiration, prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 9	Via storage, rainwater harvesting, infiltration, and/or evapotranspiration, prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 10 *	Via optimized infiltration[2], prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data	☐

1. Includes only those WMZs located in Santa Clara County.
2. Use the Santa Clara County Department of Planning and Development Online Property Profile database to determine the WMZ in which your project is located: http://www.sccplanning.org/gisprofile/

   Search for your project site by APN or Address to retrieve the Property Profile. At the bottom of the property profile page, under Special Resources/Hazards/Constraints Areas, look for the "Central Coast Watershed Management Zone Value".
3. Storage, rainwater harvesting, and/or evapotranspiration may be used when infiltration is optimized.

* Applicable only to those areas that overlay designated Groundwater Basins.

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

LID Site Assessment Checklist

ITEMS TO DOCUMENT:	INCLUDED IN PROJECT DOCUMENTS?
1. Site topography	☑
2. Hydrologic features including contiguous natural areas, wetlands, watercourses, seeps, or springs	☑
3. Depth to seasonal high groundwater	☑
4. Locations of groundwater wells used for drinking water	☐
5. Depth to an impervious layer such as bedrock	☐
6. Presence of unique geology (e.g., karst)	☐
7. Geotechnical hazards	☐
8. Documented soil and/or groundwater contamination	☐
9. Soil types and hydrologic soil groups	☑
10. Vegetative cover/trees	☑
11. Run-on characteristics (source and estimated runoff from offsite which discharges to the project area)	☐
12. Existing drainage infrastructure for the site and nearby areas including the location of municipal storm drains	☐
13. Structures including retaining walls	☐
14. Utilities	☑
15. Easements	☑
16. Covenants	☐
17. Zoning/Land Use	☑
18. Setbacks	☑
19. Open space requirements	☑
20. Other pertinent overlay(s)	☐

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

LID Site Design Measures

The Project Engineer shall certify the Project design optimizes the use of the following design measures to augment the design strategies required by Performance Requirement No. 1. Initial each runoff retention measure that has been incorporated and optimized into the design or mark NA if not applicable.

PERFORMANCE REQUIREMENT NO. 3 CERTIFICATION OF LID SITE DESIGN MEASURES

	DESIGN MEASURE	INCORPORATED/ OPTIMIZED
1.	Defining the development envelope, identifying the protected areas, and identifying areas that are most suitable for development and areas to be left undisturbed	✓
2.	Identifying conserved natural areas, including existing trees, other vegetation, and soils (shown on the plans)	✓
3.	Limit the overall impervious footprint of the project	✓
4.	Design of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety or mobility uses are not compromised	✓
5.	Set back development from creeks, wetlands, and riparian habitats	✓
6.	Design conforms the site layout along natural landforms	✓
7.	Design avoids excessive grading and disturbance of vegetation and soils	✓

I, Arman Nazemi, PE, acting as the Project Engineer for Black Rock-Quail Vineyard project, located at South quadrant of Watsonville Road ans Santa Teresa Blvd., hereby state that LID Site Design Measures initialed have been incorporated into the design of the project.

arman nazemi
Signature

May 15, 2022
Date

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

TECHNICAL INFEASIBILITY CHECKLIST

	Site Conditions	Check Applicable
1.	Depth to seasonal high groundwater limits infiltration and/or prevents construction of subgrade stormwater control measures[3]	X
2.	Depth to an impervious layer such as bedrock limits infiltration	
3.	Sites where soil types significantly limit infiltration	X
4.	Sites where pollutant mobilization in the soil or groundwater is a documented concern	
5.	Space constraints (e.g., infill projects, some redevelopment projects, high density development)	
6.	Geotechnical hazards	
7.	Stormwater Control Measures located within 100 feet of a groundwater well used for drinking water	
8.	Incompatibility with surrounding drainage system (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning treatment or flow control facility)	

[3] According to the CASQA Frequently Asked Questions about LID, "some MS4 permits and BMP guidance manuals require anywhere from 3-10 feet of separation from the groundwater level for infiltration practices. This distance depends on the soil type, pollutants of concern, and groundwater use. In some cases, however, where there may be groundwater or soil contamination, LID infiltrative practices may be restricted completely. (p. 7 in https://www.casqa.org/Portals/0/LID/CA_LID_FAQ_06-28-2011.pdf)

 File No.:_____

STORMWATER CONTROL PLAN CHECKLIST

Stormwater Control Plan Required Contents	**PR Level**	**Done?**
1. Project Information	All	
• Project name		☑
• Application number		☑
• Address and assessor's parcel number		☑
• Name of Applicant		☑
• Project Phase number (if project is being constructed in phases)		☑
• Project Type (e.g., commercial, industrial, multi-unit residential, mixed-use, public), and description		☐
2. Project Areas	All	
• Total project site area		☑
• Total new impervious surface area		☑
• Total replaced impervious surface area		☑
• Total new pervious area		☑
• Calculation of Net Impervious Area		☑
3. Statement of Performance Requirements that apply to the project:	All	
• Performance Requirement No.1 – Site Design and Runoff Reduction		☑
• Performance Requirement No.2 – Water Quality Treatment		☑
• Performance Requirement No. 3 – Runoff Retention		☑
• Performance Requirement No. 4 – Peak Management		☑
4. Delineation of Drainage Management Areas (DMAs)	All	☑
5. Summary of Site Design and Runoff Reduction Performance Requirement measures selected for the project (see PR-1 checklist)	PR-1	☑
6. Description of Runoff Reduction Measures and Structural Stormwater Control Measures, by Drainage Management Area and for entire site	PR-2, 3, and 4	☑
7. Water quality treatment calculations used to comply with the Water Quality Treatment Performance Requirement and any analysis to support infeasibility determination	PR-2	☑
8. Documentation certifying that the selection, sizing, and design of the Stormwater Control Measures meet the full or partial Water Quality Treatment Performance Requirements (see PR-2 checklist)	PR-2	☑

Stormwater Control Plan Required Contents	**PR Level**	**Done?**
9. Statement that Water Quality Treatment Performance Requirement has been met on-site, or, if not achievable: • Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements • Statement of intent to comply with Water Quality Treatment Performance Requirement through Alternative Compliance	PR-2	☑
10. LID Site Assessment Summary (see PR-3 checklist)	PR-3	☑
11. LID Site Design Measures Used (see PR-3 checklist)	PR-3	☑
12. Supporting calculations used to comply with the applicable Runoff Retention Performance Requirements	PR-3	☑
13. Documentation demonstrating infeasibility where Site Design and Runoff Reduction measures and retention-based Stormwater Control Measures cannot retain required runoff volume	PR-3	☑
14. Documentation demonstrating percentage of the project's Equivalent Impervious Surface Area dedicated to retention-based Stormwater Control Measures	PR-3	☑
15. Statement that Runoff Reduction Performance Requirement has been met on-site, or, if not achievable: • Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements • Statement of intent to comply with Runoff Retention Performance Requirements through an Alternative Compliance agreement	PR-3	☑
16. Supporting calculations used to comply with the applicable Peak Management Performance Requirements	PR-4	☑
17. Documentation demonstrating infeasibility where on-site compliance with Peak Management Performance Requirements cannot be achieved	PR-4	☑
18. Statement that Peak Management Performance Requirement has been met on-site, or, if not achievable: • Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements • Statement of intent to comply with Peak Management Requirements through an Alternative Compliance agreement		☑
19. O&M Plan for all structural SCMs to ensure long-term performance	PR-2, 3, and 4	☑
20. Owner of facilities and responsible party for conducting O&M	PR-2, 3, and 4	☑

Attachment C

Percolation Data

&

Soil Report

GEOLOGIC HAZARDS EVALUATION AND
SOIL ENGINEERING STUDY
QUAIL VINEYARDS SUBDIVISION
14905 SANTA TERESA BOULEVARD
MORGAN HILL, CALIFORNIA

September 14, 2012

Prepared for

Blackrock, LLC

Prepared by

Earth Systems Pacific
780 Montague Expressway, #205
San Jose, CA 95131

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Blackrock, LLC
14656 Stonebridge Drive
Morgan Hill, CA 95037

Attention: Mr. Doug Blackwell

Project: **Proposed Quail Vineyards Subdivision on 16.30 Acre Site**
APN 779-02-023
Santa Teresa Blvd & Watsonville Road
Unincorporated Morgan Hill, Santa Clara County, California

Subject: **Geologic Hazards Evaluation and Soil Engineering Study**

Reference: Proposal for a Geologic Hazards Evaluation and Liquefaction Analysis Plus Soil Engineering Study, Proposed Residential Subdivision on 16.30 Acre Site, APN 779-02-023, Santa Teresa Blvd & Watsonville Road, Unincorporated Morgan Hill, Santa Clara County, California by Earth Systems Pacific, dated April 23, 2012.

Dear Mr. Blackwell:

In accordance with your authorization of the above referenced proposal, this Geologic Hazards Evaluation and Soil Engineering Study has been prepared for use in the development of plans and specifications for your proposed 15-lot subdivision located on the southeast corner of Watsonville Road and Santa Teresa Boulevard. The recommendations contained herein should be considered preliminary and revised as necessary by Earth Systems Pacific once detailed plans for the project become available.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. Please do not hesitate to contact this office if there are any questions concerning this report.

Sincerely,

Earth Systems Pacific

Xyrus Mejia
Staff Engineer

Christopher M. Cecile
Project Geologist
Professional Geologist 8991

Bill E. Zehrbach
Senior Engineer
Geotechnical Engineer 926

REGISTERED PROFESSIONAL ENGINEER
BILL E. ZEHRBACH
GE 926
EXP. 9/30/13
GEOTECHNICAL
STATE OF CALIFORNIA
9/14/12

Distribution: Blackrock, LLC (4)
HMH Engineers (1)
David J Powers and Associates (1)
City of Morgan Hill, Attn: Rebecca Tolentino (1)

Doc. No.: 1209-191.SER

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GEOLOGIC HAZARDS EVALUATION AND SOIL ENGINEERING STUDY

1.0 INTRODUCTION

1.1 Site Setting

The subject site is located at the intersection of Watsonville Road and Santa Teresa Boulevard in unincorporated Morgan Hill, California. The approximate center of the project is 37.0919°N latitude and 121.6457°E longitude on the United States Geological Survey's Mt. Madonna 7.5-Minute Quadrangle (Figure 1). The property is irregular in shape and bounded to the northwest by Watsonville Road, to the northeast by Santa Teresa Boulevard and residential development, to the southwest by residential development, and to the southeast by Llagas Creek.

The property is formerly home to a Christmas tree farm. As such, numerous evergreen trees of varying sizes and ages are found throughout the property. The majority of the Christmas trees are found on the northwest half of the property. Several other trees are found throughout the remainder of the site. Currently, a single family residence, detached garage, and a barn occupy the eastern portion of the site. In addition a recently imported stockpile of soil is found on the northern corner of the site. It is our understanding that this stockpile was imported with the intent of being used during grading operations. Generally, the site slopes gently from the northern portion of the property down to Llagas Creek located on the southern portion of the site.

1.2 Planned Development

We understand that the proposed development will consist of 15 single family detached residences and internal public streets. The residential structures will be one and two stories in height, of wood frame construction, with raised wood floors over a crawl space, on flat, graded building pads.

1.3 Scope of Services

Earth Systems Pacific (ESP) performed this Geologic Hazards Evaluation and Soil Engineering Study for Blackrock LLC for the subject site located at the intersection of Watsonville Road and Santa Teresa Boulevard in unincorporated Morgan Hill, California. The purpose of the Geologic Hazards Evaluation and Soil Engineering Study is to evaluate the

potential geologic and seismic conditions which may affect development of the site and to provide design-level geotechnical engineering recommendations for the proposed project.

The scope of work for the Geologic Hazards Evaluation is intended to satisfy the requirements of California Division of Mines and Geology (CDMG) Note 42: Guidelines to Geologic/Seismic Reports. Our scope included a review of published and unpublished geologic literature, review of geologic mapping and aerial photography of the site and vicinity, a general site reconnaissance, subsurface exploration, evaluation of the data collected, quantitative analysis of liquefaction potential at the site, and preparation of a written report section with supporting graphics.

The scope of work for the Soil Engineering Study included a review of published and unpublished geotechnical literature, a general site reconnaissance, subsurface exploration, laboratory testing of selected samples, an engineering evaluation of the data collected, and preparation of this written report. The analysis and subsequent recommendations were based on information provided by the client and the conceptual grading plans by HMH.

The report and recommendations are intended to comply with the considerations of the California Building Code (CBC), 2010 Edition, and common geologic and geotechnical engineering practice in this area at this time under similar conditions. The tests were performed in general conformance with the standards noted, as modified by common geotechnical practice in this area at this time under similar conditions.

Preliminary geotechnical recommendations for site preparation and grading; foundations; exterior flatwork; utility trenches; site drainage and finish improvements; and observation and testing are presented to guide the development of project plans and specifications. It is our intent that this report be used by the client to form the geotechnical basis of the design of the project as described herein, and in the preparation of plans and specifications.

Analysis of the soil for percolation rates, mold or other microbial content, radioisotopes, hydrocarbons, or other chemical properties are beyond the scope of this report. This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, shoring, temporary slope angles, and construction means and methods. Ancillary features such as swimming pools, temporary access roads, fences, light poles, and nonstructural fills are not within our scope and are also not addressed.

To verify that pertinent issues have been addressed and to aid in conformance with the intent of this report, it is requested that final grading and foundation plans be submitted to Earth Systems Pacific for review.

In the event that there are any changes in the nature, design, or locations of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained herein will not be considered valid unless the changes are reviewed and the conclusions of this report are verified or modified in writing by the geotechnical engineer and engineering geologist. The criteria presented in this report are considered preliminary until such time as they are verified or modified in writing by the geotechnical engineer in the field during construction.

2.0 GEOLOGIC REVIEW

2.1 Regional Geologic Setting

The subject site is located in the foothills of the Santa Cruz Mountains. The Mt. Hamilton-Mt. Diablo Range and the Santa Cruz Mountains, respectively, form the eastern and western boundaries of the Santa Clara Valley in the Coast Ranges geomorphic province in central California. These northwest-trending mountain ranges are the result of tectonic uplift that has been interpreted to have been occurring since Pliocene-Pleistocene time (beginning approximately 3 to 5 million years before present). The regional basins now occupied by San Pablo and San Francisco Bays, and the Santa Clara Valley, were formed by related tectonic processes during Pleistocene time.

The predominant structural feature in the California Coast Ranges is the San Andreas fault zone, which is the structural boundary between two tectonic plates: the Pacific Plate to the west of the San Andreas fault zone and the North American Plate east of the fault. These two plates are moving past each other at approximately 5.1 cm/year at the mouth of the Gulf of California and 1 to 3 cm/year in the central and northern parts of California (Brown, 1990). The Hayward and Calaveras faults, located on the east side of the Santa Clara Valley, are interpreted to be part of the San Andreas fault system.

For the San Francisco Bay area in general, the oldest rocks east of the San Andreas fault are the Jurassic-Cretaceous Franciscan Complex. The Franciscan Complex is composed of a chaotic assemblage of mainly shale, sandstone, chert, limestone, greenstone, and serpentinite. These rocks are interpreted to represent components of ancient Pacific Ocean crust that have

been disrupted and accreted to western California during Cretaceous to early Tertiary time and prior to development of the San Andreas fault system. The Franciscan Complex is overlain by, or in fault contact with, sedimentary rocks of upper Cretaceous age in some terranes in the southern and eastern Santa Clara Valley. West of the San Andreas fault, the oldest rocks are the predominantly Mesozoic granitic Salinian Block. Mesozoic and Paleozoic metamorphic rocks are a lesser component of the Salinian Block. On both sides of the San Andreas fault, the oldest rocks are overlain by Tertiary and Quaternary marine and terrestrial sedimentary rocks and local volcanic rocks. All of the above rock units were faulted, folded, and uplifted due to plate motions and activity on the San Andreas, Hayward, Calaveras, and smaller related faults. This deformation began about 30 million years ago but is mainly Pliocene to Pleistocene in age (~5 million to 11,700 years ago). Holocene-age (11,700 years to present-day) plate motion is expressed mainly as creep and seismicity on the various faults of the San Andreas fault system.

The Quaternary sediment in Santa Clara Valley was deposited when older rocks in the Santa Cruz Mountains and the Mt. Hamilton-Mt. Diablo Range were exposed to erosion by tectonic uplift.

2.2 Geologic Literature Review

2.2.1 Soil and Geologic Mapping

Two dominant soils are mapped at the site by the U.S. Department of Agriculture (Web Soil Survey, 2012). The northern half of the site is mapped as Pleasanton Loam (PoA) and the southern half is mapped as Zamora clay loam (ZbA). A thin strip of riverwash (less than 0.5% of the site area) is shown along the margin of Llagas Creek in the southernmost corner of the site.

PoA is described as a loam which occupies terraces and alluvial fans (0-2% slopes) and is derived from alluvium. It is described as well drained with a saturated hydraulic conductivity of 4.425 µm/s (0.64 inches/hr). The USDA describes PoA as a silty clay (CL-ML) with a published plasticity index of 13 and liquid limit of 35. Published data describes the soil as having a pH of 6.7 and an electroconductivity of 0.5 mmhos/cm.

ZbA is described as forming from alluvium derived from alluvial fans and is found on 0-2% slopes. It is described as a lean clay (CL) with a published plasticity index of 15 and liquid limit of 36. The USDA describes ZbA as well drained with a saturated hydraulic

conductivity of 2.7 μm/s (0.39 inches/hr). Published data describes the soil as having a pH of 7.0 and an electroconductivity of 0.6 mmhos/cm.

Dibblee (1973, 2005) mapped the geology of the Mount Madonna 7.5 Minute Quadrangle at a scale of 1:24,000. Dibblee shows the site as located in Quaternary alluvium (Qa). Franciscan rocks are shown in the nearby vicinity to the north and south. The nearest fault trace mapped by Dibblee is the Ben Lomond fault, located approximately 1.2 miles to the southwest, trending northwesterly across Hayes Valley. The fault is shown as concealed by Quaternary alluvium and is shown crossing through Franciscan rocks indicating Cretaceous through Tertiary as possible ages of faulting. Several other similar faults are shown to the southwest prior to reaching the Berrocal and Sargent faults 4.9 miles and 5.6 miles southwest, respectively. Both the Berrocal and Sargent faults offset Tertiary aged strata indicating at least Tertiary for possible age of faulting.

McLaughlin, et al. (2001) mapped the geology of the Mount Madonna Quadrangle at a scale of 1:24,000 (Figure 2). The map shows the site location as underlain by Plesitocene fan deposits on the north half of the site, and Holocene levee deposits on the southern half. Franciscan rocks are also shown in the general vicinity of the site. The overall geology indicates that the site is likely underlain by a Holocene and Pleistocene alluvium which overlies the Franciscan beneath the site. The Ben Lomond fault of Dibblee (2005) is shown as concealed by both Holocene and Pleistocene age alluvium; indicating that the fault in this area is older than Pleistocene. The Berrocal and Sargent faults are shown 4.9 and 5.6 miles to the southwest. These faults are both shown as concealed by Pleistocene deposits, again indicating Tertiary for possible age of faulting.

2.2.2 Faulting

Active faults are defined by the California Geological Survey (CGS) as faults that are well defined and have experienced movement within the last 11,700 years (Hart and Bryant, 2007). The definition of potentially active faults varies, however. A generally accepted definition of a potentially active fault is one that shows evidence of displacement older than 11,700 years and younger than 1,600,000 years (i.e., Pleistocene in age). However, potentially active is no longer used as criteria for zoning by the state. The terms sufficiently active and well-defined are now used by the CGS as criteria for zoning faults under the Alquist-Priolo Act (Hart and Bryant, 2007). Inactive faults are classified as not having been active within the last 1.8 million years.

The site is located within the seismically active Coyote Valley area, but outside current State Earthquake Fault Zones (CGS, 1976) and County Fault Rupture Hazard Zone (County of Santa Clara, 2002). The nearest State-zoned fault is the San Andreas fault. The nearest County zoned fault is the Sargent-Berrocal fault zone approximately 6 miles southwest of the subject site.

The major active faults in the southern Santa Clara County Area are the San Andreas and Calaveras faults. The San Andreas fault is approximately 7.9 miles southwest of the site and the Calaveras faults is located approximately 5.3 miles northeast of the site (WGCEP, 2008).

The nearest mapped fault to the site, irrespective of zoning, is the Ben Lomond fault mapped by Dibblee (2005) approximately 1.2 miles to the southwest of the proposed project site, trending northwesterly. Other nearby faults include the Berrocal (Pleistocene-active; Jennings, 2010), and Sargent fault (Holocene-active; Jennings, 2010).

2.2.3 Landsliding

No State of California Seismic Hazard Zone map currently exists for the Mount Madonna Quadrangle. The County of Santa Clara (2002a; Figure 3). Shows a landslide hazard zone extending approximately 100 feet into the southernmost portion of the site. No slides have been mapped on or around the subject site by others.

2.2.4 Liquefaction

No State of California Seismic Hazard Zone map currently exists for the Mount Madonna Quadrangle. The site is located in a liquefaction hazard zone defined by the County of Santa Clara (2002b) (Figure 4).

2.2.5 Earthquake History

Several strong earthquakes have occurred on the active faults in the San Francisco Bay region within the last 200 years (Figures 5 and 6). Especially notable are the 6.8M 1868 Hayward earthquake, the 1906 8.3M San Francisco earthquake, the 1926 Monterey Bay 6.1M doublet, the August 6, 1979, 5.8M Coyote Lake earthquake, the April 24, 1984, 6.2M Morgan Hill (Halls Valley) earthquake, and the October 17, 1989, 7.1M (6.9Mw) Loma Prieta earthquake. The Calaveras fault is considered active from San Ramon to Hollister (Hart, 1984), and three earthquakes of Richter magnitude 5.8 and larger have occurred on the Calaveras fault since 1900 (Stover, 1984).

The epicenters of the 1984 Morgan Hill (Mw 6.1) and 1989 Loma Prieta (Mw 6.9) earthquakes were, respectively, approximately 16.4 miles north and 13.1 miles southwest of the subject site. The 1984 Morgan Hill earthquake produced ground shaking equivalent to a modified Mercalli intensity of VIII and the 1989 Loma Prieta earthquake also produced ground shaking equivalent to a modified Mercalli intensity of VII in the 95037 zip code of Morgan Hill (USGS, 2012). Figure 7 is a reproduction of the Modified Mercalli Intensity Scale (ABAG, 2003). It should be expected that the subject site will be affected by future earthquakes of comparable or greater magnitude than the 1984 Morgan Hill and 1989 Loma Prieta earthquakes.

Whereas the U.S. Geological Survey no longer attempts to predict the occurrence and magnitude of future earthquakes, the Working Group on California Earthquake Probabilities (2008) has estimated that there is a 63% probability that one or more major earthquakes (M_W 6.7+) will occur in the Bay Area by the year 2037 (Figure 8). The Hayward fault is considered the most likely fault in the Bay Area (31% probability) followed by the San Andreas fault (21%) and the Calaveras fault (7%) to have a major earthquake by the year 2037.

2.3 Aerial Photo Interpretations

Earth Systems Pacific reviewed aerial photographs of the site and vicinity from 1956 through 1988, for the presence of terrain features indicative of landslides or active fault zones. The subject site is visible on the photographs we reviewed.

A lineament is seen in stereo aerial photographs as a feature having tonal differences on either side. These differences may be due to changes in soil or rock type, vegetation, groundwater levels, geologic structure, or sedimentary bedding characteristics. Lineaments are sometimes associated with topographic features characteristic of faults, such as linear and shutter ridges, sag ponds, spring zones, and offset drainages. No photo lineaments were observed to cross the proposed project site. The nearest lineaments observed were associated with the Coyote Creek fault (4.2 miles northeast) and the Calaveras fault (5.3 miles northeast).

The aerial photographs were also examined for geomorphic features characteristic of ancient (dormant) and active landslides. No evidence of landsliding was observed on or adjacent to the site. Several small scale slides and colluvial swales were observed to the west of the site, but these do not discharge on or near the site.

3.0 FIELD INVESTIGATION AND LABORATORY TESTING

3.1 Subsurface Exploration

The subsurface exploration consisted of seven exploratory borings drilled at the site on May 21, 2012. The exploratory borings were drilled under the direction of an ESP staff engineer at the approximate locations shown on the Site Map (Figure 9). The borings were drilled to depths of 15 to 32 feet below the ground surface. The borings were drilled using a truck-mounted B-53 drill rig equipped with an 8-inch diameter, continuous-flight hollow-stem auger. Soil materials encountered in the borings were categorized and logged in general accordance with the Unified Soil Classification System. Copies of the boring logs are included in Appendix A.

3.2 Subsurface Profile

Our borings at the site generally encountered 4 to 12 feet of brown to dark brown, very stiff to hard, sandy lean clay (CL) overlying granular soil layers. Generally, the thicker clay layers wrap the northwest, northeast, and southeast edges of the property. Two borings located towards the center of the property, Borings B3 and B6, had thinner clay surficial layers on the order of 4 to 4.5 feet. Below the clay, we encountered medium dense to dense, clayey sands (SC) and gravel-sand-clay mixtures (GC) to the bottom of the depths explored with the exception of Borings B1 and B7. Borings B1 and B7 (closest to Llagas Creek), drilled to depths of 25 and 31 feet, encountered shale at the bottom of the explored depths. At the shale contact, drilling and sampling refusal was encountered.

Groundwater was encountered between 8 and 12 feet below the ground surface. Publicly available data from the State Water Resources Control Board's GeoTracker (2012) database indicates that the site was historically home to two underground storage tanks which were removed in 1976 and 2000. The site was closed in 2000. Santa Clara Valley Water District documents indicate that groundwater monitoring was performed and that the highest groundwater depth was 12.51 feet below the ground surface. It should be noted, however, that fluctuations in the level of subsurface water can occur due to variations in rainfall, temperature, and other factors, and groundwater levels should not be considered constant.

3.3 Laboratory Testing

As the borings were drilled, soil samples were obtained using a tube-lined barrel sampler (ASTM D 3550-01 (2007) with shoe similar to D 2937-04). Standard penetration tests were

also performed at selected intervals (ASTM D 1586-08a). Selected tube samples were tested for moisture content and dry density (ASTM D 2216-05 and D 2937-04), two samples were tested for shear strength (ASTM D 3080-04), one sample was tested for a plasticity index (ASTM D 4318-10), and five samples were tested for grain size characteristics (ASTM D 1140-06). One bulk sample was tested for an R-Value (ASTM D 2844-07). Copies of the laboratory test results are included in Appendix B.

4.0 DATA ANALYSIS

4.1 Subsurface Soil Classification

Based on the boring data, the site is assigned to Site Class D (stiff soil) as defined by Table 1613.5.2 of the 2010 CBC.

4.2 Seismic Design Parameters

The seismic parameters presented in Table 1 comply with Chapter 16 of the California Building Code (2010 Edition). The values were determined utilizing the USGS Earthquake Hazards Program Earthquake Ground Motion Parameter Java Application and the International Building Code provisions.

TABLE 1

Summary of Seismic Parameters - CBC 2010
(Site Coordinates 37.0919°N, 121.6457°W)

Site Class	D	
Short Term Spectral Response Parameter - S_s	1.500g	
1 Second Spectral Response Parameter - S_1	0.605g	
Site Coefficient – F_a	1.0	($S_s \geq 1.25$)
Site Coefficient - F_v	1.5	($S_1 \geq 0.5$)

4.3 Deterministic Seismic Hazard Evaluation

Estimated peak horizontal ground acceleration is one of the basic parameters used to characterize the ground shaking potential at a given site. Actual ground accelerations at a locality are influenced by topography, geologic structure, condition of subsurface materials, and groundwater level. Table 2 lists the estimated seismic parameters for known active faults in the San Francisco Bay region that could produce earthquakes that would impact the site.

The estimated mean peak horizontal ground accelerations presented in Table 2 are based upon the mean, 5% damped, peak ground acceleration derived from three Next Generation Attenuation (NGA) relationships. The NGA relationships used were Campbell & Bozorgnia (2008), Boore & Atkinson (2008), and Chiou & Young (2006). The fault parameters used in our analysis were obtained from the WGCEP Uniform California Earthquake Rupture Forecast (UCERF1; 2002), and UCERF2 (2008) with estimated Type B source recurrence intervals from the California Geological Survey (CGS) Open File Report 96-08 (1996). For historically considered faults (no longer considered as independent seismic sources), such as the Sargent fault, fault parameters were obtained from Cao et al (2003). For our analysis we used an estimated Vs_{30} = 365 m/s, based on the site geology and the soil classification (Site Class D) determined in accordance with Table 1613.5.2 of the 2010 California Building Code.

This method of seismic analysis is a deterministic approach in that the maximum considered earthquake (MCE) along each active fault within the region that may be reasonably expected to generate strong ground shaking at the site is evaluated. Table 2 also lists the distance of the causative faults from the site as derived from the computer program EQFAULT (Blake, 2004), and supplemented by data obtained from published geologic maps, the possible earthquake magnitudes that may be generated by the faults, the recurrence interval for the faults, and the seismic source type classification of WGCEP UCERF2 (2008).

Based on the data presented in Table 2, below, it appears that the highest peak ground acceleration will result from an earthquake occurring on the San Andreas fault. The highest short period ground acceleration would result from an earthquake occurring on the Calaveras fault. The highest 1-second ground acceleration would result from an earthquake on the San Andreas fault. We have included the Sargent fault and the southeast extension of the Hayward fault in our search due to their historical zoning status. The values given are conservative in that it is assumed that the earthquake will occur at the near-point of a fault relative to the site.

TABLE 2
Deterministic Estimates of Ground Acceleration for Significant Known Faults in the Site Region ("Stiff Soil" Site[2])

Fault	Closest Distance (mi/km)	Maximum Magnitude (Mw)[1]	Estimated Ground Acceleration (g) Mean[2] PGA	T_s	T_1	Recurrence Interval[3] (years)	Source Type[4]
Calaveras	5.3/8.5	7.0	0.302	**0.649**	0.386	54	A
Sargent*	5.6/9.0	6.8	0.284	0.622	0.343	1200	B
San Andreas	8.6/13.8	8.05	**0.314**	0.622	**0.462**	229	A
Zayante-Vergeles	11.8/19.1	7.0	0.199	0.437	0.225	8821	B
Hayward (SE Extension)*	13.2/21.1	6.4	0.136	0.328	0.132	220	B
Monte Vista-Shannon	13.3/21.5	6.5	0.142	0.341	0.143	2410	B
Quien Sabe	19.3/31.1	6.6	0.121	0.277	0.118	647	B

[1] Moment magnitude from WGCEP UCERF2 (2008) or Cao et al (2003)
[2] Ground Accelerations estimated from mean of NGA relationships using Vs30=540m/s (assumed) (2010 CBC Site Class C Soil)
[3] Recurrence intervals from WGCEP UCERF2 (2008) or CDMG OFR 96-08.
[4] Seismic source type from WGCEP UCERF2 (2008).
*Not included in 2002 CGS Data, (Cao et al, 2003) or 2008 WGCEP data.

4.3 Quantitative Liquefaction Analysis

Soil liquefaction is a phenomenon where saturated granular soils undergo a substantial loss of strength due to increased pore water pressure resulting from cyclic stress applications induced by earthquakes or other vibrations. In this process, the soil acquires mobility sufficient to permit both vertical and horizontal movements, which may result in significant deformations. Soils most susceptible to liquefaction are loose, uniformly graded, fine-grained sands. In addition, recent literature indicates that fine grained soils may also be susceptible to liquefaction or cyclic strain softening. Examples of highly susceptible fine-grained soil include "nonplastic silts and clayey silts of low plasticity (PI<12) at high water content to liquid limit ratios (w_c/LL>0.85)." Examples of soils moderately susceptible to liquefaction include "clayey silts and silty clays of moderate plasticity (12<PI<18) at w_c/LL>0.80" (Bray and Sancio, 2006). It is generally acknowledged that liquefaction will not occur if these deposits are located at a depth greater than 50 feet below the ground surface. In the deeper deposits, the greater overburden pressure is sufficient to prevent liquefaction from occurring.

The liquefaction potential at the subject site was evaluated using the methodology suggested in the 1996 and 1998 National Center for Earthquake Engineering Research workshops (NCEER) on evaluation of liquefaction resistance of soils (Youd & Idriss, editors), and the 1999 Southern California Earthquake Center (SCEC) "Recommended Procedures for Implementation of DMG

Special Publication 117". A brief outline about the variables involved in the liquefaction evaluation process is described below.

One of the steps of liquefaction potential evaluation consists of normalizing the SPT blow count to the effective overburden stress of 100 kilopascal (or 1.044 tons per square foot). This is denoted as $N_{1(60)}$ and is found through the following formula:

$$N_{1(60)} = N_m C_N C_E C_B C_R C_S$$

where:

N_m = measured standard penetration resistance
C_N = factor to normalize N_m to a common reference effective over-burden stress
C_E = hammer energy ratio (ER) correction factor
C_B = borehole diameter correction factor
C_R = rod length correction factor
C_S =correction factor for samplers with or without liners

Factor	Variable	Term	Correction
Overburden Pressure		C_N	$(P_a/\sigma'_{vo})^{0.5}$; $0.4<C_N<2$
Energy Ratio	Safety Hammer Donut Hammer Automatic Trip Hammer	C_E	0.60 to 1.17 0.45 to 1.00 0.9 to 1.6
Borehole Diameter	65 mm to 115 mm 150 mm 200mm	C_B	1.0 1.05 1.15
Rod Length	3m to 4m 4m to 6m 6m to 10m 10m to 30m >30 m	C_R	0.75 0.85 0.95 1.0 <1.0
Sampling Method	Standard Sampler Sampler without liners	C_S	1.0 1.2

The other steps involve obtaining two variables: the seismic demand on a soil layer, expressed in terms of CSR (cyclic stress ratio), and the capacity of a soil layer to resist liquefaction, expressed in terms of CRR (cyclic resistance ratio).

CSR can be calculated using the following equation:

$$CSR = (\tau_{av}/\sigma'_{vo}) = 0.65(a_{max}/g)(\sigma_{vo}/\sigma'_{vo})r_d$$

where:
a_{max} = peak horizontal acceleration at the ground surface generated by the earthquake
g = acceleration of gravity
σ_{vo} = total vertical overburden stress
σ'_{vo} = effective vertical overburden stress
r_d = stress reduction coefficient

CRR can be obtained from the Simplified Base Curve graphical representation recommended for determination of CRR from SPT for Magnitude 7.5 along with Empirical Liquefaction Data (after Youd and Idriss 1977). A factor of safety (FS) against liquefaction is then calculated using the following equation:

$$FS = (CRR_{7.5}/CSR)\ MSF$$

where $CRR_{7.5}$ is the cyclic resistance ratio for a magnitude 7.5 earthquake and MSF is the magnitude scaling factor. The soil layer is considered to be potentially liquefiable if the CRR and CSR established for the soil stratum at a given depth produce a factor of safety against liquefaction, CRR/CSR, less than the selected factor of safety for the project. A general guideline in selecting an appropriate factor of safety for a project is shown in the table below (SCEC, 1999):

Consequence of Liquefaction	$(N_1)_{60}$ (clean sand)	Factor of Safety
Settlement	≤15 ≥30	1.1 1.0
Surface Manifestation	≤15 ≥30	1.2 1.0
Lateral Spreading	≤15 ≥30	1.3 1.0

The variables discussed in the above text are used to develop a profile of the soil, and an in-house developed computer spreadsheet analysis is carried out to assess liquefaction triggering, liquefaction settlement, and seismically induced settlement.

4.3.1 Analysis

For the analysis, a high groundwater elevation of 8 feet was modeled (highest encountered groundwater during exploration work). The peak ground acceleration (pga) used in the analysis was taken as 0.57g, the highest pga taken from the three sources listed below.

Peak Ground Acceleration	Source
0.31g	Deterministic Estimates of Ground Acceleration (this study)
0.40g	SDs/2.5, Paragraph 1802.2.7 of the California Building Code (2010 Edition)
0.57g	2002 California Probabilistic Seismic Hazard Assessment (PSHA) Model developed jointly by the CGS and USGS

In general, the fine grained clay soils found at the site in the upper 4 to 12 feet are stiff to very stiff and in our opinion are not susceptible to liquefaction. The coarse grained soils found below the clay soils vary in consistency throughout the site. Generally, the dense nature of these coarse grained materials resulted in higher factors of safety against liquefaction occurrence. However, in two borings (B3 and B4) loose to medium dense granular soils were encountered that are susceptible to liquefaction or dry sand subsidence. A summary of our liquefaction analysis is presented below.

Liquefaction Analysis (Groundwater – 8 feet)

Boring Number	Dry Sand Subsidence (inches)	Liquefaction Settlement (inches)	Total Liquefied Thickness (feet)
B1	0	0	0
B2	0	0	0
B3	0.2	0.5	4
B4	0	0.5	4
B5	0	0	0
B6	0	0	0
B7	0	0	0

4.3.2 Discussion

The loose to medium dense coarse soils found in Borings B3 and B4 that are susceptible to liquefaction are classified as poorly graded sand to clayey gravels. The analysis on these layers indicates that approximately ½ inch of liquefaction related settlement may occur. These saturated, loose to medium dense layers are not found uniformly throughout the site and are

located away from Llagas Creek, and therefore liquefaction settlement is not anticipated to occur throughout the entire site, but in localized areas.

In addition, the liquefaction analysis presented above was run using a high groundwater of 8 feet, which was encountered in only one boring (B3). If we ran the analysis using the 12 foot water table (shown in table below) as found in the remaining borings as well as in the Santa Clara Valley Water District documents, liquefaction susceptibility of the site is considered low.

Liquefaction Analysis (Groundwater – 12 feet)

Boring Number	Dry Sand Subsidence (inches)	Liquefaction Settlement (inches)	Total Liquefied Thickness (feet)
B3	0.2	0	0
B4	0.1	0	0

Surface Manifestation

Under the analysis modeling groundwater at 8 feet, surface manifestation (sand boils and ground cracking) as a result of a liquefaction event is possible and may lead to loss of bearing capacity. The possibility of surface manifestation would be considered low under the analysis modeling groundwater at 12 feet.

Lateral Spreading

The borings most critical to liquefaction analysis (B1 and B7) were located towards Llagas Creek, and our liquefaction analysis indicated low susceptibility due to the dense nature of the coarse grained soils and shale encountered at the bottom of the borings. Since the liquefiable sediments found on the site in Borings B3 and B4 are not uniform throughout the site and located away from Llagas Creek, lateral spreading is considered low.

5.0 GEOLOGIC ANALYSIS AND CONCLUSIONS

This Geologic Hazards Evaluation was conducted to determine the geologic conditions at the subject site and to evaluate potential geologic hazards that may impact the proposed development. Our Geologic Hazards Evaluation focused on addressing potential geologic hazards associated with slope stability. In general, the potential geologic hazards encountered in the San Francisco Bay Area include landslides, debris flows, and the hazards concomitant with earthquakes. Earthquake-related hazards include ground rupture along the trace of a

fault, ground shaking, ridge-top cracking, lateral spreading, lurching, liquefaction, and earthquake-induced landsliding.

The following conclusions are based on the data acquired and analyzed during the course of ESP's Geologic Hazards Evaluation. The site geology is shown on Figure 9.

5.1 Primary Seismic Hazards

5.11 Ground Rupture

The proposed building sites are not within an earthquake fault zone as defined by the current published State fault rupture maps that we reviewed. There are no mapped active fault traces that cross, or trend towards, the building site. It is ESP's opinion that the potential for surface rupture at the site is low.

5.2.2 Ridge-top Cracking

The effects of topography on relative ground shaking intensity and resultant ground surface disturbance and structural damage were noted in the Santa Cruz Mountains after the 1906 San Francisco Earthquake (Lawson, 1908) and the 1989 Loma Prieta earthquake (Plafker and Galloway, 1989). Ridge-top cracking during the 1989 Loma Prieta earthquake damaged roadways and structures approximately 10 km from the epicenter in the Summit Road area of the Santa Cruz Mountains. The origin of the cracks is complex, and may have been caused in part by large-scale lateral spreading in the relatively soft Tertiary sedimentary rocks that form the northwest-trending ridges in the region (Plafker and Galloway, 1989). The topographic effects of ground shaking and high level of ground cracking and structural damage after the Loma Prieta earthquake have been studied at Robinwood Ridge, approximately 7.5 km north-northwest of the epicenter (Hartzell et al., 1994). The study by Hartzell et al. concluded that the apparent amplification of ground shaking is a complex interaction of seismic and topographic conditions that cannot be quantified with existing data. The site is not located in terrain comparable to that affected by the 1989 Loma Prieta earthquake. The potential for ridge-top cracking is deemed to be low at the site.

5.2.3 Ground Shaking

The main identified geologic hazard at this site is the potential for strong seismic ground shaking. A moderate to major earthquake on the San Andreas, Calaveras, or any of the other nearby active faults could cause severe ground shaking at the site. The foundations for the

proposed residences should be designed for seismic shaking, including horizontal and vertical accelerations, as required by the latest edition of the California Building Code. These values should be considered minimum design criteria.

5.2 Secondary Earthquake Effects

5.2.1 Landslides

The geologic maps and aerial photographs examined for this Geologic Hazards Evaluation do not show the site to be located near any existing landslides. Only the southernmost portion of the property is within a Santa Clara County landslide hazard zone. The subject site is located in relatively flat terrain and no features indicative of landsliding were observed on the site during our site visit. It is ESP's opinion that the hazard posed by landsliding is low.

5.2.2 Liquefaction

Our analyses indicate that there is a potential for liquefaction resulting from ground shaking during conditions of high groundwater. Total settlements would be on the order of 0.5 inches or less. However, there is a potential for some surface manifestation in portions of the site.

5.3 Other Geologic Concerns

5.3.1 Debris Flows

Debris flows are a type of landslide characterized by a rapidly flowing mass of rock fragments, soil, and mud with more then half of the particles being larger than sand size and typically containing cobbles and boulders as well. Debris flows generally are initiated in colluvium filled hollows. These flows result almost invariably from unusually heavy rain, and tend to find their way into drainages and travel for significant distances. For example, a catastrophic rainstorm in the San Francisco Bay area in January 1982 deposited nearly half the normal annual rainfall in 32 hours and triggered more than 18,000 landslides, principally debris flows, and caused 25 fatalities and $66 million in property damage (NOAA, 2005). Due to the site's location away from natural drainages and thick colluvial filled hollows, the potential for debris flows to affect the proposed building sites is considered low.

5.3.2 Flooding

According to Flood Insurance Rate Map, Panel Number 06085C 0609H, dated May 18, 2009, published by the Federal Emergency Management Agency (FEMA), the site is located in areas of Zone X, Zone D, and Zone AE (Figure 10). Zone X is described as *areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood.* Zone D is described as *areas where flood risk is undetermined, but possible.* Zone AE is described as *Floodway – channel of stream and adjacent floodplain areas that must be kept free of encroachment.*

Zone AE appears to clip the rear of Lots 14 and 15. No structures may be constructed within this zone.

6.0 SUMMARIZED GEOLOGIC CONCLUSIONS AND RECOMMENDATIONS

The proposed subdivision at the subject site is considered feasible from a geologic viewpoint provided the recommendations contained herein are implemented in the design and construction of the development. The property owner should be aware that development in the seismically active Bay Area entails variable risks, which may include potential structural distress to residences and on-site pavements, plus disruption of local roads and utilities.

The main identified geologic hazards at the site is the potential for strong seismic shaking due to an earthquake on one or more of the more active faults in the San Francisco Bay Area and the potential for localized liquefaction of the near surface soils. A moderate to major earthquake on the San Andreas, Calaveras or other nearby faults could cause severe ground shaking at the site. The foundations for the proposed structures and anticipated improvements should be designed to accommodate seismic shaking and the effects of liquefaction.

No evidence of large scale active or dormant landsliding which might affect the proposed development was noted during our review of aerial photographs or site reconnaissance. No landslides have been mapped by others on or near the site. It is our opinion that the hazard posed by landsliding at the site is low.

The site is underlain by alluvial sediment to between 22 and 31 feet below the ground surface. Beneath this, drilling refusal was encountered in hard dark gray shale. Under the highest water conditions, the site would be susceptible to liquefaction and surface manifestation. In our

opinion, the most detrimental effect liquefaction would have on the site would be the possibility of bearing capacity loss during a seismic event.

The geotechnical engineering conclusions and recommendations presented in the Sections 7.0 and 8.0 of this report should be implemented during the design and construction of the proposed subdivision.

7.0 SOIL ENGINEERING CONCLUSIONS

7.1 Site Suitability

Based on our analysis of the results of the field investigation and laboratory testing program, it is our opinion that the site is geotechnically suitable for the proposed residential subdivision, provided the recommendations contained herein are implemented in the design and construction. The primary geotechnical concerns at the site are the expansion potential of the surficial soils and the potential for liquefaction related ground deformation.

7.2 Soil Expansion Potential

The surficial soils have a Plasticity Index (PI) of 27 indicating a moderately high expansion potential. In general, expansive soils tend to swell with increases in soil moisture and shrink as the soil moisture decreases. The volume changes that the soils undergo in this cyclical pattern can stress foundations, slabs, and exterior flatwork if precautionary measures are not incorporated into the construction procedure. Due to the expansive nature of the surficial soil, deepening footings and presoaking foundation excavations may be deemed necessary.

7.3 Liquefaction Mitigation

Based on our analysis there is a potential for localized liquefaction at the site that could affect improvements, depending upon the depth to groundwater. Three possible measures were considered to mitigate the effects of liquefaction on the building foundations. One measure would be to utilize an integrated foundation system with through-going strip footings and tie beams with no isolated foundation elements. The second measure would be to over-excavate the building pad approximately 4 feet below the bottom of the foundations, place a filter fabric across the bottom of the excavation and backfill the excavation to design pad grade. The third measure would be to utilize concrete mat or PT foundation slabs. The report provides recommendations for the first option, the unitized foundation system. Recommendations for the other two options can be provided upon request.

7.4 Site Preparation and Grading

According to the *Conceptual Grading Plan*, the lots have pad elevations on the order of 340.5 to 343. In order to reach these pad grades, fill on the order of 2 to 4 feet is anticipated throughout the site, with the deeper fills towards the northern portion of the site. Prior to fill and grading work, a significant amount of site preparation will need to take place. This would entail stripping the site of vegetation, removal of trees and their root systems, and the razing of existing structures. To account for possible ground disturbance from these activities, sub-excavation on the order of 1 to 2 feet in building pad areas is required.

7.5 Foundations

The proposed Quail Vineyard residences may be supported by conventional strip footings constructed on a graded building pad. To mitigate the effects of potential liquefaction, the foundation system should be integrated, with through going strip footings or tie beams and no isolated footings. Concrete post-tensioned foundations are another alternative.

7.6 Static Settlement

The foundation loads are anticipated to be typical for conventional wood frame buildings. Static settlements are not anticipated to exceed 1 inch with differential settlement of less than ½ inch between adjacent foundation elements.

7.7 Existing Stockpile

It is our understanding that the on-site stockpile is from a previous jobsite located at 1115 Newhall Drive in San Jose, California. According to the US Department of Agriculture, Soil Conservation Service, the surficial soils at the borrow site are silty clays of the Sunnyvale series. These soils are characterized as having a Plasticity Index in the range of 20 to 30, indicating an expansion potential similar to that of the on-site native soils. Cornerstone Earth Group prepared a letter report titled "Supplemental Geotechnical Recommendations" for the development at the borrow site. They indicated that near surface soils at the borrow site are a mixture of import soils from a site in Palo Alto with PI's ranging from about 18 to 37. The estimated that the average PI is about 25 based on their laboratory testing. The Geotechnical Engineer should review the stockpile prior for use as fill on the site.

8.0 SOIL ENGINEERING RECOMMENDATIONS

8.1 Site Preparation and Grading

General Site Preparation

8.1.1 Site clearing, placement of fill, and grading operations at the site should be conducted in accordance with the recommendations provided in this report. Compaction recommendations for site grading work can be found later in this section.

8.1.2 Existing utilities, where known, should be located on the grading plans, to assist the Geotechnical Engineer during grading operations. Existing utility lines that will not be serving the proposed subdivision should be either removed or properly abandoned. The necessity of removing abandoned underground utility lines should be determined by the Geotechnical Engineer during site grading.

8.1.3 Surface vegetation (weeds, shrubs, etc.), and organically contaminated topsoil must be removed from areas to be graded. The depth of surface organic stripping will probably vary and should be determined by the Geotechnical Engineer during grading operations. Organically contaminated soils may either be stockpiled and later used as topsoil in landscaping areas or removed from the site.

8.1.4 Trees that are to be removed from the site should have their main root systems removed. In addition, tree roots larger than 1 inch in diameter should be chased out and removed. The depressions from the removal of the tree root systems should be reviewed by the Geotechnical Engineer to determine the need of additional excavation work. Once approved, the bottom of the depression should be scarified and cross-scarified 8 inches in depth, moisture conditioned, and recompacted. The depressions should then be backfilled with approved, compacted, moisture conditioned structural fill, as recommended in other sections of this report.

8.1.5 It is likely that tree removal and demolition of the existing residences and associated buildings will disturb the ground. Therefore we recommend that the upper 12 to 24 inches of existing ground in the proposed building areas be sub-excavated and the excavation reviewed by the Geotechnical Engineer. The lateral extent of the sub-excavation should extend at least 5 feet beyond the proposed building footprint and appurtenant concrete flatwork. If disturbed soil, remnants of foundations, large tree roots, or debris are encountered after the removal of the upper 24 inches, additional

sub-excavation should be performed until identified undocumented fill, loose disturbed soil, or debris is removed from the building footprint. Once clean undisturbed soil is encountered, the bottom of the excavation should be scarified and cross-scarified 8 inches in depth, moisture conditioned, and recompacted. The depressions should then be backfilled with approved, compacted, moisture conditioned structural fill, as recommended in other sections of this report.

8.1.6 Over-excavated material can be re-used as fill provided it is cleared of excessive quantities of organics or other potentially deleterious materials. Tree roots larger than one inch in diameter should be removed from the fill material. The fill should be placed in moisture conditioned lifts not exceeding 8 inches in non-compacted thickness.

8.1.7 The Geotechnical Engineer should be notified at least 48 hours prior to commencement of grading operations.

Compaction Recommendations

8.1.8 In general, prior to placement of fill on the site, the surface soils should be scarified at least 8 inches, moisture conditioned and recompacted to the recommended relative compaction present below, unless noted otherwise. This scarification operation should be performed at locations designated for proposed structural fill, concrete slabs-on-grade, foundations and asphalt pavement areas.

8.1.9 Recompacted native soils and structural fill should be compacted to a minimum relative compaction of 90 percent of maximum dry density at a moisture content above optimum. Pavement subgrade should be compacted to a minimum 92 percent of maximum dry density at a moisture content above optimum. Aggregate base should be compacted to at least 95 percent of maximum density.

8.1.10 Due to the fine-grained nature of the upper soils, and depending on moisture conditions at the time of construction, there is a potential for the soils to become unstable during grading. Unstable soils hinder compactive effort and are inappropriate for placement of additional fill. Alternatives to correct instability include aeration to dry the soils, lime treatment, over-excavation and recompaction, and the use of gravel or geotextiles as stabilizing measures. Recommendations for stabilization should be provided by a representative of Earth Systems Pacific, as needed, during construction.

8.2 Foundations

8.2.1 The proposed residential structures may be supported by either conventional strip foundations or concrete post-tensioned foundations. Recommendations for both systems are provided below.

Conventional Foundation Systems

8.2.2 To mitigate the potential effects of liquefaction, it is recommended that the foundation system consist of through going strip footings and tie beams. Isolated spread footings are not recommended.

8.2.3 The foundations should extend a minimum of 24 inches below the lowest adjacent soil pad grade. Foundations should be designed using a maximum allowable bearing capacity of 2,500 psf dead plus live load. This value may be increased by one-third when transient wind loads are included. No increase is allowed for seismic loading conditions.

8.2.4 Minimum widths of continuous footings should be 12 inches

8.2.5 Resistance to lateral loads should be calculated based on a passive equivalent fluid pressure of 300 pcf and a friction factor of 0.3. Passive and frictional resistance can be combined in the calculations without reduction to either value. These values are based on the assumption that backfill adjacent to foundations is properly compacted. The upper 12 inches of embedment should be neglected where landscape soil abuts the foundation.

8.2.6 The foundation excavations should be moisture conditioned to over optimum to close any desiccation cracks prior to the placement of concrete, as recommended by the Geotechnical Engineer in the field. The Geotechnical Engineer should observe the foundation excavations prior to forming or placement of reinforcing steel to verify the adequacy of the conditioning or recommend additional moisture conditioning, if deemed necessary.

8.2.7 Foundation excavations should be free of excessive slough prior to placement of concrete and reinforcing steel. The footings should be reinforced as directed by the

architect/engineer. For the expansive soil condition, we recommend at least one #5 bar, top and bottom.

Concrete Post-tensioned Slab-On-Grade Foundations

8.2.8 The post-tensioned slab should be designed in accordance with the provisions of the current edition of the California Building Code and the recommendations of the Post-Tensioning Institute. Geotechnical design parameters presented below were calculated in accordance with the third edition of "Design of Post-Tensioned Slabs-on-Ground" by the Post-Tensioning Institute.

Edge Moisture Variation Distance (e_m)	
Center Lift Condition	9.0 feet
Edge Lift Condition	4.6 feet
Estimated Differential Swell (y_m)	
Center Lift Condition	1.0 inches
Edge Lift Condition	1.5 inches
Allowable Bearing Capacity (dead load)	1,000 psf
Allowable Bearing Capacity (dead + live loads)	1,500 psf
Allowable Bearing Capacity (DL+LL+ wind or seismic)	2,000 psf
Subgrade Friction Factor (slab against subgrade)	0.25
Total settlement (static)	1 inch
Differential settlement (static)	0.5 inches

8.2.9 The building pad should be periodically moisture conditioned as necessary to maintain the soil moisture content at a minimum of 2 percentage points above optimum until the placement of concrete or vapor retarding membranes. The moisture content of the soil should be tested by the Geotechnical Engineer prior to placement of the concrete or vapor retarding membranes.

8.2.10 In areas where moisture transmitted from the subgrade would be undesirable, a vapor retarder should be utilized beneath the floor slab. The vapor retarder should comply with ASTM Standard Specification E 1745-11 and the latest recommendations of ACI Committee 302. The vapor retarder should be installed in accordance with ASTM Standard Practice E 1643-11. Care should be taken to properly lap and seal the vapor retarder, particularly around utilities, and to protect it from damage during construction.

8.2.11 If sand, gravel or other permeable material is to be placed over the vapor retarder, the material over the vapor retarder should be only lightly moistened and not saturated

prior to casting the slab. Excess water above the vapor retarder would increase the potential for moisture damage to floor coverings. Recent studies, including those by ACI Committee 302, have concluded that excess water above the vapor retarder would increase the potential for moisture damage to floor coverings and could increase the potential for mold growth or other microbial contamination. These studies also concluded that it is preferable to eliminate the sand layer and place the slab in direct contact with the vapor retarder, particularly during wet weather construction. However, placing the concrete directly on the vapor retarder would require special attention to using the proper vapor retarder, concrete mix design, and finishing and curing techniques. In this case, the vapor retarder should be underlain by at least 2 inches of clean washed pea gravel or crushed gravel.

8.2.12 When concrete slabs are in direct contact with vapor retarders, the concrete water to cement (w/c) ratio must be correctly specified to control bleed water and plastic shrinkage and cracking. The concrete w/c ratio for this type of application is typically in the range of 0.45 to 0.50. The concrete should be properly cured to reduce slab curling and plastic shrinkage cracking. Concrete materials, placement, and curing methods should be specified by the architect/engineer.

8.2.13 To further protect moisture-sensitive floor coverings, the perimeters of the post-tensioned slabs should be deepened to penetrate a minimum of 4 inches into the subgrade soil. Also, the concrete could be proportioned to reduce its porosity (and its corresponding potential for transmitting moisture) by limiting the w/c ratio to 0.48 or less.

8.2.14 Post-tensioned slabs should be constructed and maintained in accordance with the publication *Construction and Maintenance Manual for Post-Tensioned Slab-on-Ground Foundations* by the Post-Tensioning Institute. Particular attention should be paid to the "Property Owner Maintenance" and "Landscaping" sections of the Manual.

8.3 Slab-on-Grade Construction

8.3.1 Conventional interior slab-on-grade floors are not recommended due to the expansive nature of the native soils. Slabs-on-grade in garages should be underlain by a minimum 6 inches of ¾ inch clean crushed rock or compacted aggregate base.

8.3.2 For slab-on-grade floor construction in areas where moisture sensitive materials will be stored directly on the slab, a capillary break and cushion layer should be constructed between the floor slab and the compacted soil building pad. This capillary break should consist of a vapor retarder (as described above), underlain in turn by 6 inches of clean crushed gravel or compacted aggregate base. A layer of clean sand over the vapor retarder is optional.

8.4 Exterior Slab-On-Grade Construction

8.4.1 Exterior flatwork should have minimum thicknesses of 4 full inches and should be reinforced as directed by the architect/engineer.

8.4.2 For exterior non-traffic bearing concrete slabs-on-grade such as sidewalks and patios, the flatwork should be underlain by a minimum 4-inch layer of compacted, non-expansive material such as aggregate base. A greater thickness of non-expansive material would enhance flatwork performance. Prior to placement of the non-expansive material, the soil in the flatwork area should be above optimum moisture content, and no desiccation cracks should be present.

8.4.3 Assuming that movement (i.e., ¼-inch or more) of exterior flatwork is acceptable, the flatwork should be designed to be independent of the building foundations. The flatwork should not be doweled to foundations, and a separator should be placed between the two.

8.4.4 To reduce shrinkage cracks in concrete, the concrete aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the concrete should be properly placed and finished, contraction joints should be installed, and the concrete should be properly cured. Concrete materials, placement and curing specifications should be at the direction of the architect/engineer.

8.5 Pavement Sections

Asphalt Pavement

8.5.1 A bulk sample of the surficial material was tested for a Resistance Value (R-Value) test, resulting in an R-Value of 9. For design considerations, an R-Value of 5 was selected to account for variations in subgrade soil conditions. The asphalt concrete (AC) sections were designed in accordance with the Caltrans Highway Design Method

for Traffic Indices (TIs) of 4 through 7. Determination of the appropriate TI for each area to be paved is the province of the architect/engineer. The calculated base and AC thicknesses are for compacted material. Normal Caltrans construction tolerances should apply. The aggregate base should conform to Caltrans Class 2.

AC Pavement Sections
(R-Value - 5)

R-Value	Traffic Index	AC Thickness	Class 2 Base Thickness
5	4.0	2.5"	7.5"
5	4.5	2.5"	9.5"
5	5.0	3.0"	10.0"
5	5.5	3.0"	12.0"
5	6.0	3.5"	12.5"
5	6.5	3.5"	14.0"
5	7.0	4.0"	15.0"

Concrete (PCC) Pavements

8.5.2 Portland Cement Concrete (PCC) pavements in automobile parking areas should be at least 4 inches thick. Lightly loaded concrete pavements, subjected primarily to automobile traffic, should be a minimum 5 inches thick. Concrete pavement which will experience periodic truck traffic, such as garbage truck or moving van routes, should be a minimum of 6 inches thick.

8.5.3 Reinforcing of the concrete is optional. The concrete should have a minimum modulus of rupture of 650 psi. Construction joints should be doweled. The concrete pavement sections should be underlain by a minimum of 6 inches of compacted Class 2 aggregate base. A modulus of subgrade reaction of 150 pci may be assumed in the design of the concrete pavements.

General Conditions

8.5.4 Since the anticipated subgrade soils comprise expansive clays, the existing subgrade soils may have elevated moisture contents at the time of construction, making it difficult to achieve the recommended compaction. It may be necessary to aerate the soil to bring the moisture content to within the compactable range prior to recompaction. Over-excavation and replacement with additional aggregate base, the use of geosynthetic materials such as geogrid, and lime treatment are additional

mitigation measures that may be necessary. Additional recommendations can be prepared once site grading of the proposed pavement areas begins.

8.5.5 The subgrade soil should be scarified 8 inches, moisture conditioned as necessary and be compacted to the recommendations in Section 8.1.9. Aggregate base should be compacted to at least 95 percent of maximum dry density.

8.5.6 The subgrade and base should be firm and unyielding when proof-rolled with heavy, rubber-tired equipment prior to paving. The subgrade soils should be periodically moistened as necessary prior to placement of the aggregate base to maintain the soil moisture content near optimum.

8.5.7 Pavement longevity will be enhanced if the surface grade drains away from the edges of the pavement. Finished AC surfaces should slope toward drainage facilities at 2 percent where practicable, but in no case should water be allowed to pond.

8.5.8 Cutoff walls below curbs and around landscape islands should be constructed to extend the life of both asphalt and concrete pavement by reducing irrigation water and runoff that seeps into the aggregate base. Where utilized, cutoff walls should extend through the aggregate base to penetrate a minimum of 4 inches into the subgrade soils.

8.6 Utility Trenches

8.6.1. It is assumed that utility pipes will be properly bedded and shaded at least 6 inches over the top of the pipe with an approved, imported, granular material. For purposes of this discussion, trench backfill is defined as that portion of the backfill material placed above the import shading material. It is further assumed that the trenches will not exceed about 10 feet in depth.

8.6.2. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utility pipes. The site soils may be used for trench backfill above the select material. If obtaining compaction is difficult with the site soils, use of more easily compacted sand may be desirable. The upper foot of backfill should consist of native material to reduce the potential for seepage of water into the backfill except under slabs and pavements

8.6.3. Trench backfill should be compacted to a minimum of 90 percent of maximum dry density. The existing native soils may be used for trench backfill if properly prepared

and compacted. Jetting to compact utility trench backfill should not be allowed. Jetting of granular shading material around corrugated pipes and multiple conduit joint pipes may be considered.

8.6.4. Import sand or pea gravel may also be used as trench backfill, if so desired. The pea gravel should be clean, washed and rounded, and will require mechanical compaction with vibratory plates. Existing soil and import materials, such as sand or quarry fines, will also require mechanical compaction, and may require moisture conditioning prior to compaction operations.

8.6.5. Where utility trenches extend under perimeter foundations, the trenches should be backfilled entirely with native soil compacted to a minimum of 90 percent of maximum dry density. The zone of native soil should extend to a minimum distance of 2 feet on both sides of the foundation. If utility pipes pass through sleeves cast into the perimeter foundations, the annulus between the pipes and sleeves should be sealed.

8.6.6. In landscape areas, at least the final 24 inches of backfill should be compacted, approved fill soil, to reduce the potential for surface rain or irrigation water from rapidly penetrating down into the trench. Under pavement areas the top 12 inches should be compacted, approved fill soil.

8.6.7. Where trenches pass from landscape areas to pavement areas, at least a three foot length of trench, centered on the curb line, should be backfilled with native soil to reduce the potential for lateral migration of water from the planter to the pavement area.

8.7 Site Drainage and Finish Improvements

8.7.1 Unpaved ground surfaces should be finish graded to direct surface runoff away from building foundation improvements at a minimum 5 percent grade for a minimum distance of 10 feet. If this is not practicable due to the terrain or other site features, swales with improved surfaces should be provided to divert drainage away from improvements. The landscaping should be planned and installed to maintain proper surface drainage conditions.

8.7.2 Runoff from driveways, roof gutters, downspouts, planter drains and other improvements should discharge in a non-erosive manner away from foundations, pavements, and other improvements.

8.7.3 Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means during and following construction is essential to protect the site from erosion damage. Care should be taken to establish and maintain vegetation.

8.7.4 Raised planter beds adjacent to foundations should be provided with sealed sides and bottoms so that irrigation water is not allowed to penetrate the subsurface beneath foundations. Outlets should be provided in the planters to direct accumulated irrigation and rain water away from foundations.

8.7.5 Open areas adjacent to exterior flatwork should be irrigated or otherwise maintained so that relatively constant moisture conditions are created throughout the year. Irrigation systems should be controlled to the minimum levels that will sustain the vegetation without saturating the soil.

8.8 Geotechnical Observation and Testing

8.8.1 It must be recognized that the recommendations contained in this report are based on a limited number of borings performed by Earth Systems Pacific, and rely on continuity of the subsurface conditions encountered.

8.8.2 It is assumed that the Geotechnical Engineer will be retained to provide consultation during the design phase, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.

8.8.3 Unless otherwise stated, the terms "compacted" and "recompacted" refer to soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent of maximum dry density. The standard tests used to define maximum dry density and field density should be ASTM D 1557-09 and ASTM D 6938-10, respectively, or other methods acceptable to the geotechnical engineer and jurisdiction.

8.8.4 "Moisture conditioning" refers to adjusting the soil moisture to at least optimum moisture, or as recommended in this report, prior to application of compactive effort. If the soils are overly moist so that they become unstable, or if the recommended compaction cannot be readily achieved, drying the soil to optimum moisture content or just above may be necessary. Placement of gravel layers, geotextiles, or lime treatment may also be necessary to help stabilize unstable soils. The Geotechnical Engineer should be contacted for recommendations for mitigating unstable soils.

8.8.5 At a minimum, the following should be provided by the Geotechnical Engineer:

- Review of grading and foundation plans and details as they near completion
- Professional observation during site preparation, grading, and foundation excavation
- Oversight of soil compaction testing during grading
- Oversight of soils special inspection during grading

8.8.6 Special inspection of grading should be provided as per Section 1704.7 and Table 1704.7 of the CBC; the soils special inspector should be under the direction of the Geotechnical Engineer. The amount of coverage to be provided will be determined during the grading operations. The following operations should be subject to soils special inspection:

- Stripping and clearing of vegetation and deleterious materials
- Scarification, moisture conditioning and recompaction
- Observation of the over-excavation of wet, loose, or disturbed soils and undocumented fills
- Fill placement and compaction
- Proposed imported materials
- Foundation excavations
- Compaction and proof rolling pavement subgrade and aggregate base
- Utility trench backfill compaction
- Retaining wall backfill compaction

8.8.7 It will be necessary to develop a program of quality control prior to beginning grading. It is the responsibility of the owner, contractor, or project manager to determine additional inspection items required by the architect/engineer or the governing jurisdiction.

8.8.8 A preconstruction conference among a representative of the owner, the Geotechnical Engineer, soil special inspector, the architect/engineer, and contractors is recommended to discuss planned construction procedures and quality control requirements. Earth Systems Pacific should be notified at least 48 hours prior to beginning grading operations.

8.8.9 If Earth Systems Pacific is not retained to provide construction observation and testing services, it will not be responsible for the interpretation of the information by others or any consequences arising there from.

9.0 CLOSURE

This report is valid for conditions as they exist at this time for the type of project described herein. Our intent was to perform this study in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the Scope of Services section. Application beyond the stated intent is strictly at the user's risk.

If changes with respect to the project type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions stated in this report are not correct, Earth Systems Pacific should be notified for modifications to this report. Items not specifically addressed in this report should comply with the California Building Code and the requirements of the governing jurisdiction.

As detailed plans for the proposed residential subdivision were not available at the time of this report, the recommendations contained herein should be reviewed and revised as necessary by the Geotechnical Engineer once final plans for the proposed improvements become available.

The recommendations of this report are based upon the geologic and geotechnical conditions encountered during this study and previous studies by others, and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by Earth Systems Pacific based on conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report should be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and his authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. Please feel free to contact this office at your convenience if you have any questions regarding this report.

End of Text

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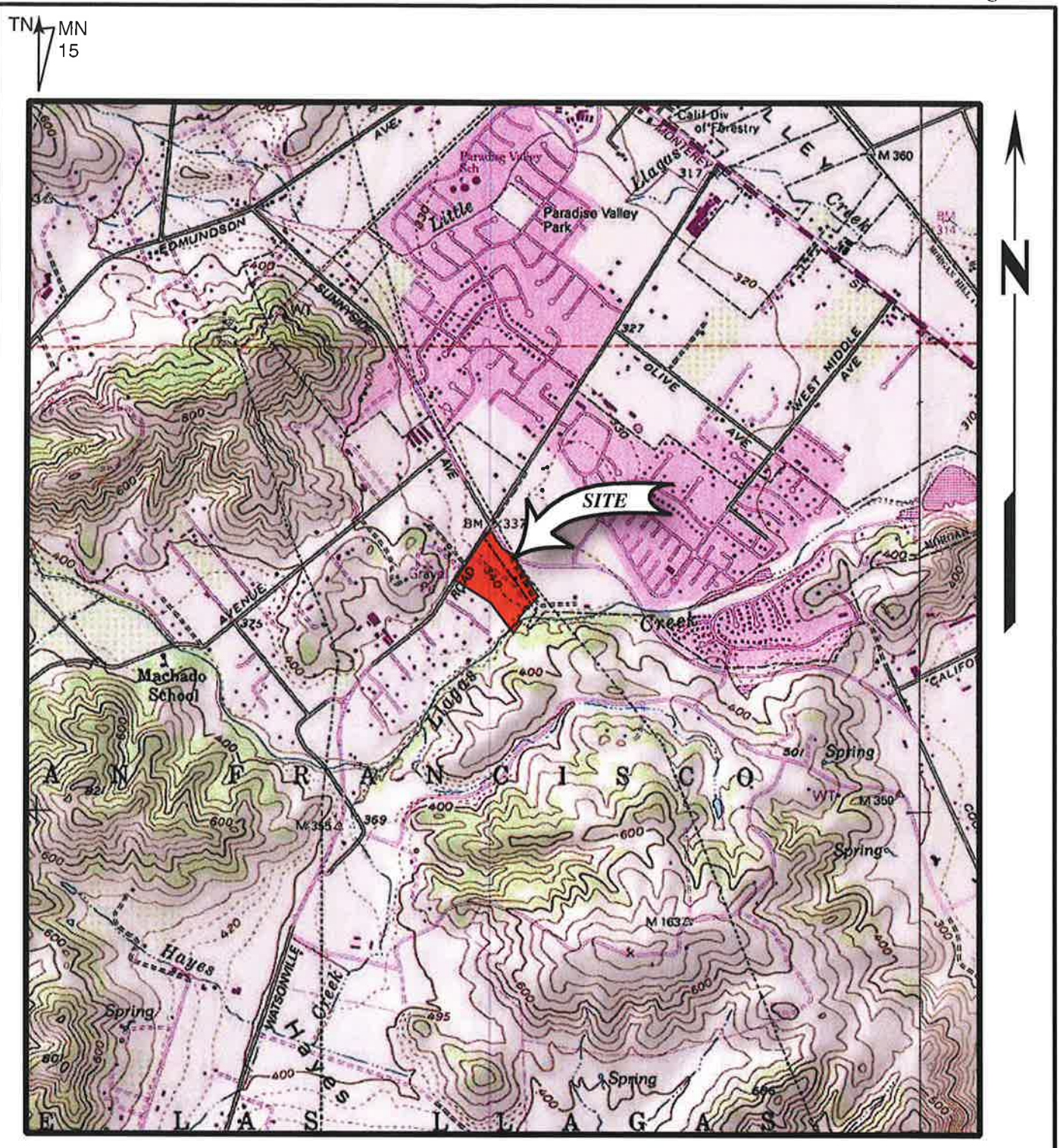
Aerial Photographs (Stereo Pairs)

Date	Scale	Type	Source	Ref. No.
6/12/56	1:24,000	B&W	ESP Archives	CIV-7R-157/158
8/25/70	1:48,000	B&W	ESP Archives	AV-965-16-41/42
5/10/88	1:12,000	B&W	ESP Archives	AV-3281-5-15/16

FIGURES

Figure 1



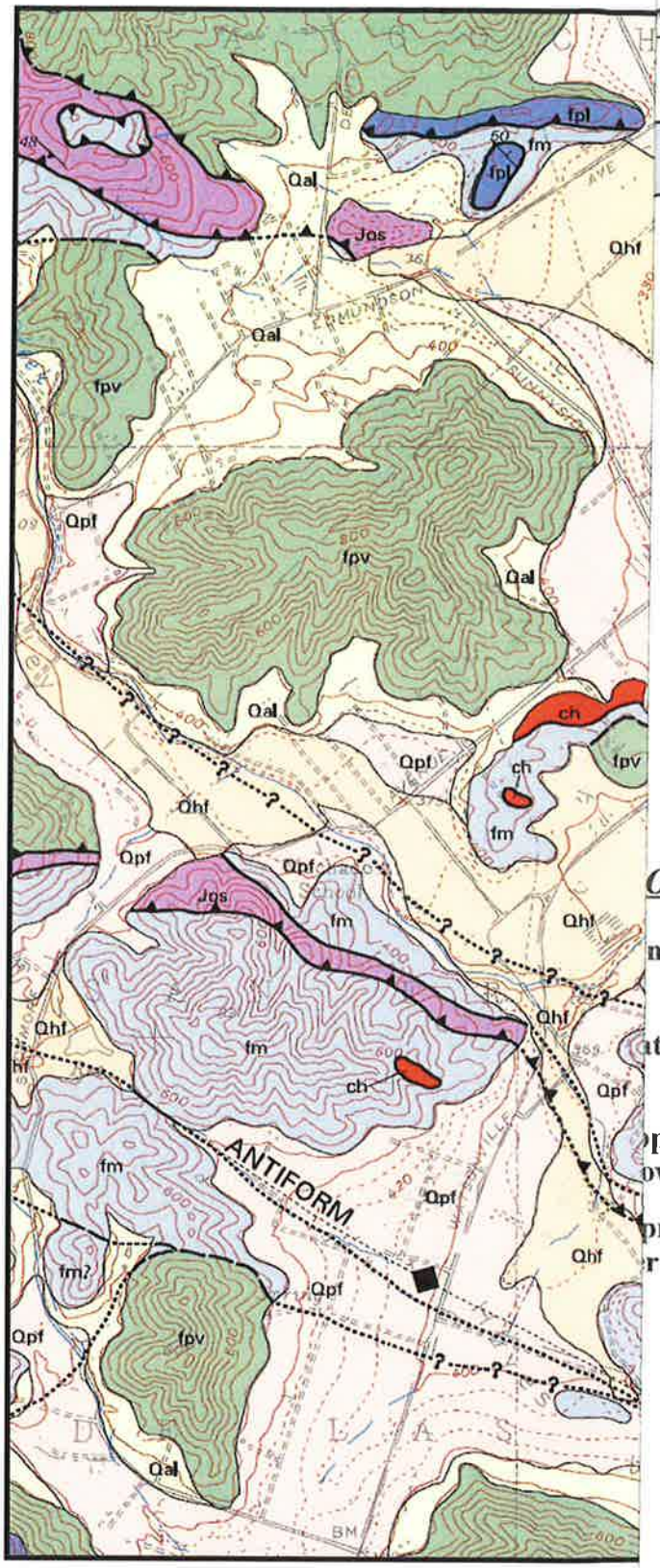
Approximate Scale 1: 24,000

1 0 Mile

1 0 1 Kilometer

Base: U.S.G.S. 7.5 minute Mt Madonna Quadrangle
Map created with Topo!" © 2003 National Geographic (www.nationalgeographic.cm/topo)

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**Site Location Map** **SH-11788-SA**



Base: McLaughlin et. al, (2001)

VD

Franciscan Complex (Cretaceous and Jurassic)

fm — **Mélange of the Central Belt (Upper Cretaceous)**

ch — **Chert blocks**

Permanente Terrane (Cretaceous)

fpl — **Foraminiferal limestone (Upper and Lower Cretaceous)**

fpv — **Volcanic rocks (Lower Cretaceous)**

OLS

mate, dotted where concealed, queried where

te, dotted where concealed, queried where

proximate, dotted where concealed, queried
own-dropped side

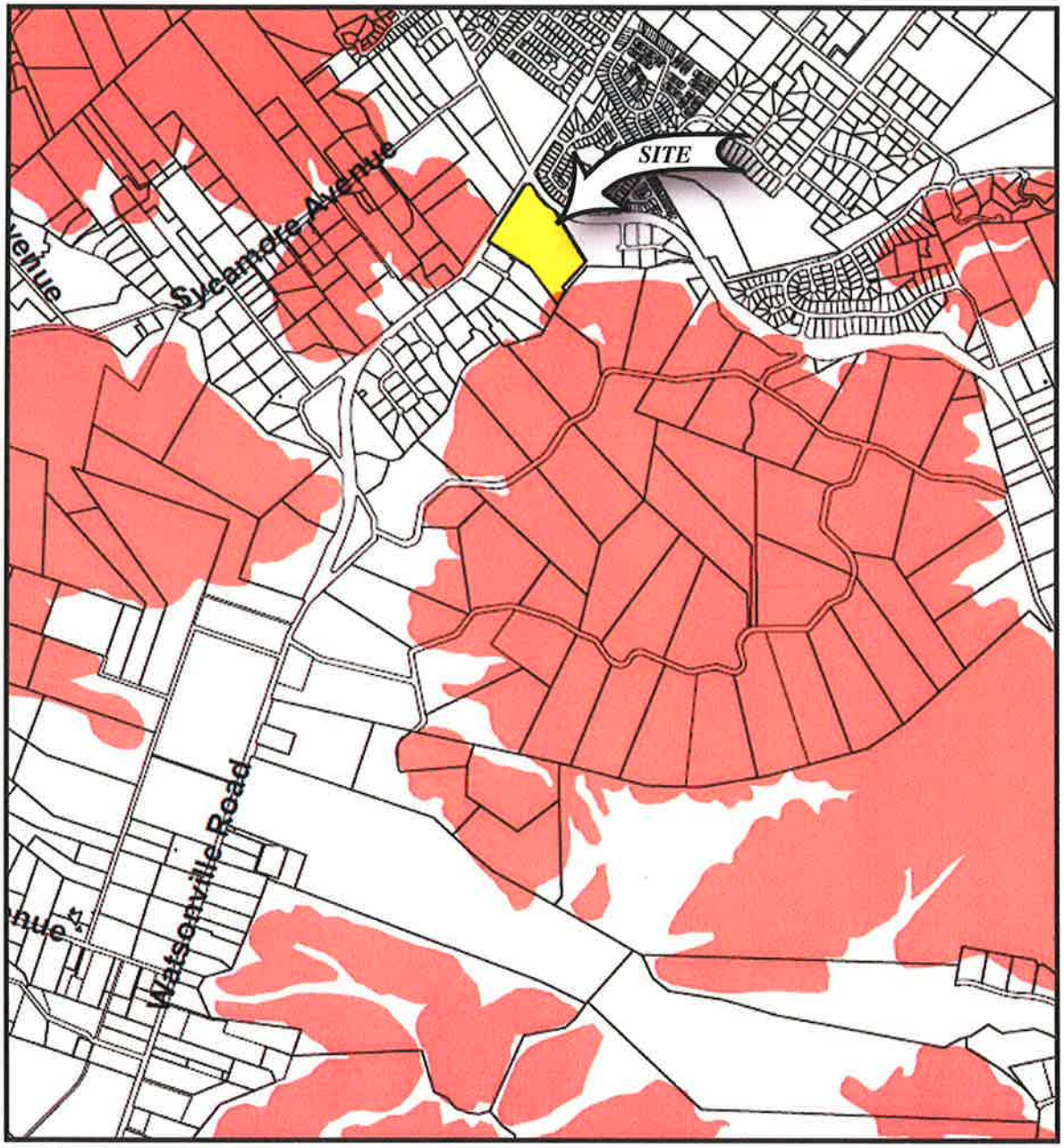
proximate, dotted where concealed, queried
r plate

gic Map

00 | **SH-11788-SA**

Earth Systems Pacific

Figure 3



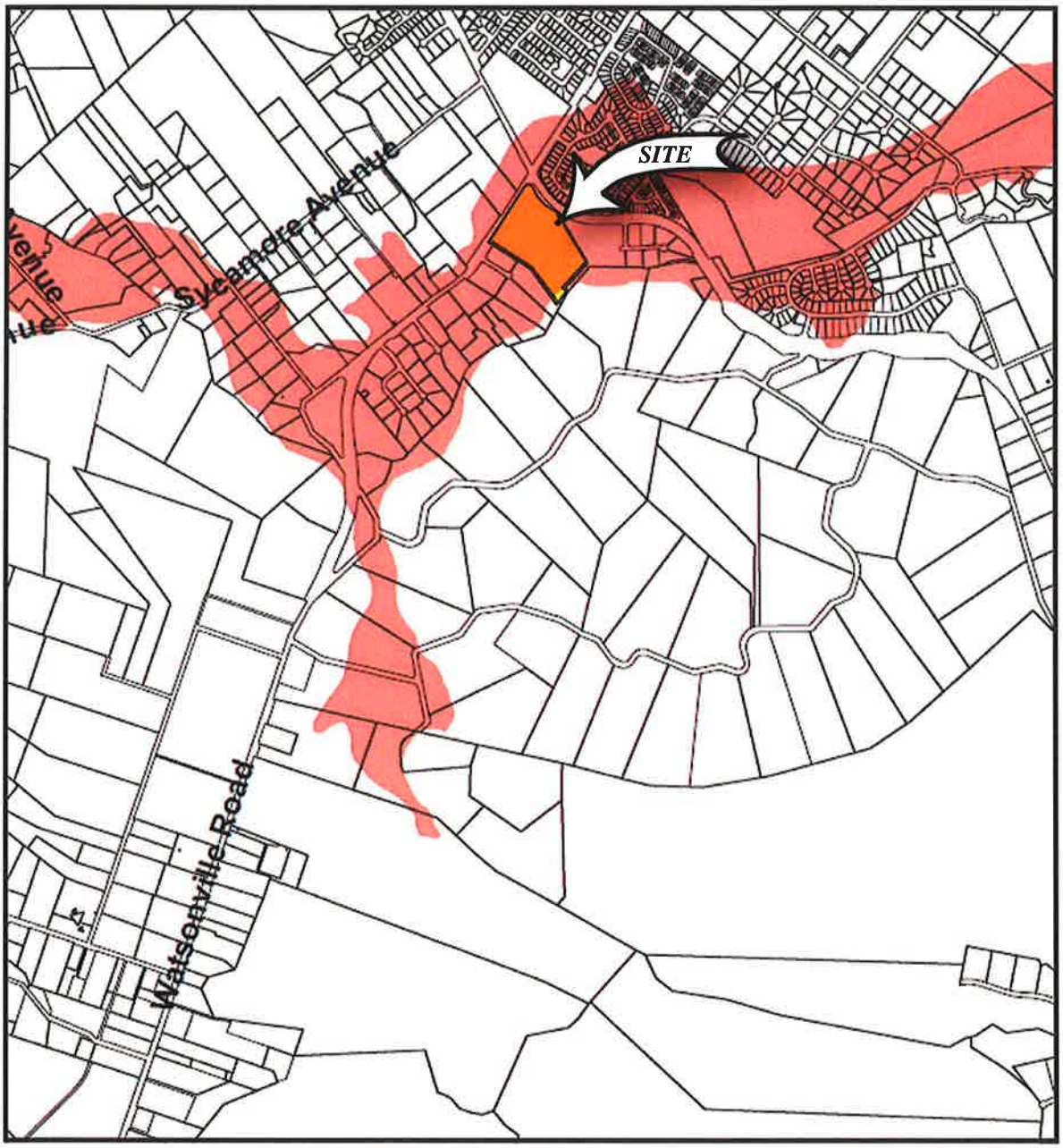
Base: Santa Clara County (2002b)

Landslide Hazard Zones

2000 0 2000
Approximate Scale in Feet

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**Landslide Hazard Map** **SH-11788-SA**

Figure 4



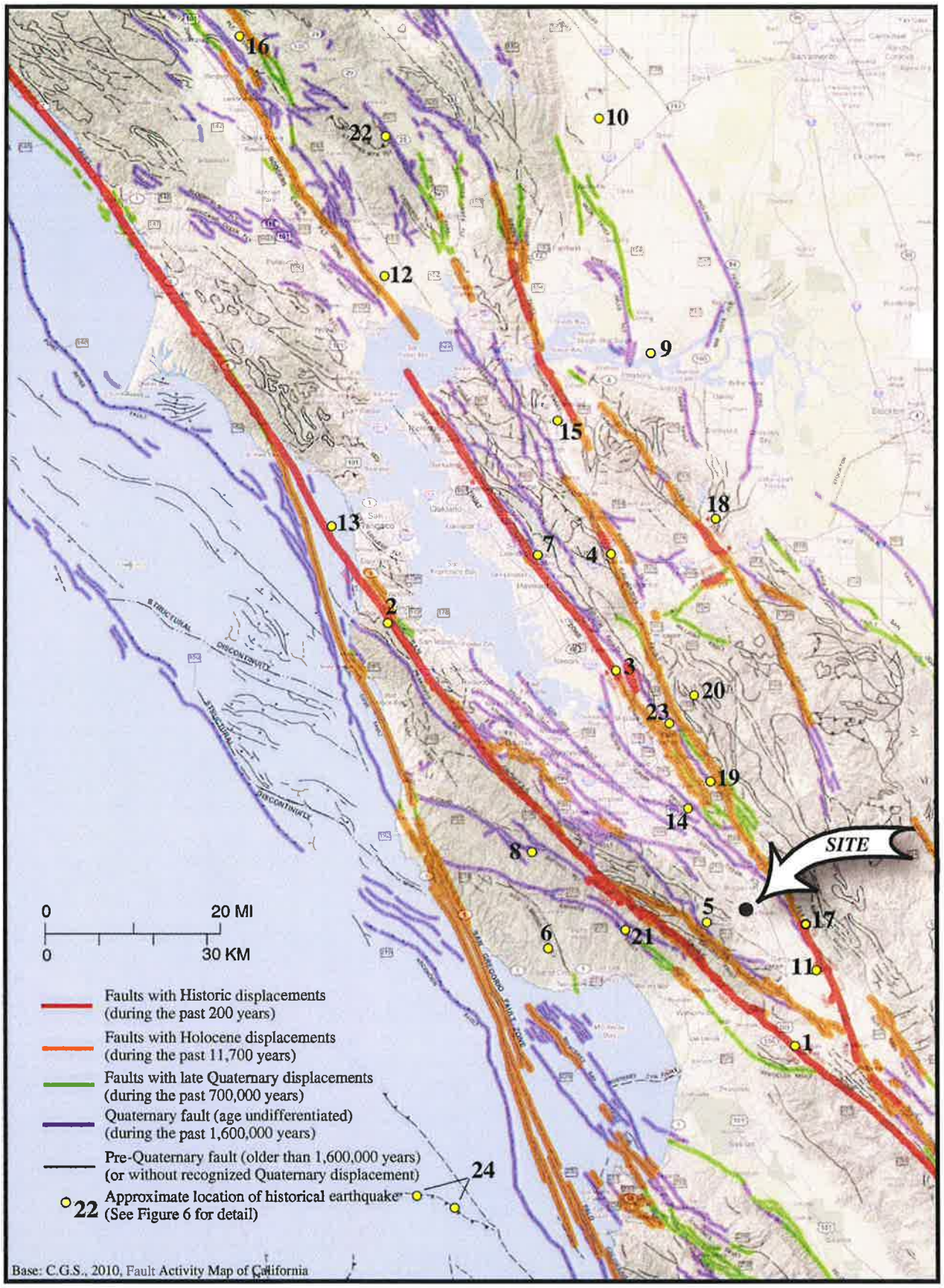
Base: Santa Clara County (2002c)

Liquefaction Hazard Zones

2000 0 2000
Approximate Scale in Feet

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**Liquefaction Hazard Map** **SH-11788-SA**

Figure 5



Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Regional Faults and Earthquakes** **SH-11788-SA**

Selected San Francisco Bay Area Earthquakes

Location Number (Refer to Figure 5)	Earthquake and Year	Magnitude Reported	Reference
1	Monterey Bay Area, 1836	M 6.8	Toppozada, 1998
2	San Francisco, 1838	M 7.0	Toppozada, 1981
3	Hayward, 1858	M 6.1	Toppozada, 1981
4	Calaveras-Dublin, 1861	M 5.9	Toppozada, 1981
5	Santa Clara Valley, 1864	M 5.9	Toppozada, 1981
6	Santa Cruz, 1865	M 6.3	Toppozada, 1981
7	Hayward, 1868	M 6.8	Toppozada, 1981
8	San Andreas, 1870	M 5.8	Toppozada, 1981
9	Antioch-Collinsville		
	1889	M 6.0	Toppozada, 1981
	1965	M 4.9	Toppozada, 1981
10	Vacaville-Winters, 1892	M 6.4	Toppozada, 1981
11	Calaveras, 1897	M 6.2	Toppozada, 1981
12	Mare Island, 1898	M 6.5	Goter, 1988
13	San Francisco, 1906	M 7.8	U.S. Geological Survey, 2010
14	San Jose, 1911	M 6.5	Toppozada and Parke, 1982
15	Concord, 1955	M 5.4	Tocher, 1959
16	Santa Rosa, 1969	M 5.6	Cloud, 1970
17	Coyote Lake, 1979	M 5.9	Hart, 1988
18	Greenville, 1980	M 5.8	Oppenheimer, 1990
19	Morgan Hill, 1984	M 6.2	Oppenheimer, 1990
20	Mount Lewis, 1986	M 5.7	U.S. Geological Survey, 1989
21	Loma Prieta, 1989	M 7.1	U.S. Geological Survey, 1989
22	Napa, 2000	M 5.2	U.S. Geological Survey, 2000
23	Calaveras Reservoir, 2007	M 5.4	U.S. Geological Survey, 2009
24	Monterey Bay		
	1926	M6.1	NCDEC, 2010
	1926	M6.1	NCDEC, 2010

NOTE: Modified After Geomatrix, (1992)
Update, USGS, 2010

Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Selected Earthquakes** **SH-11788-SA**

Figure 7

MODIFIED MERCALLI INTENSITY SCALE

MMI Value	Summary Damage Description Used on 1995 Maps	2003 Description of Shaking Severity	Full Description
I			Not felt. Marginal and long period effects of large earthquakes.
II			Felt by persons at rest, on upper floors, or favorably placed.
III			Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV			Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frames creak.
V	Pictures Move	Light	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Objects Fall	Moderate	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knicknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and Masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly or heard to rustle).
VII	Nonstructural Damage	Strong	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to Masonry D, including cracks. Weak chimneys broken off at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in Masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	Moderate Damage	Very Strong	Steering of motor cars affected. Damage to Masonry C; partial collapse. Some damage to Masonry B, none to Masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	Heavy Damage	Violent	General panic. Masonry D destroyed; Masonry C heavily damaged, sometimes with complete collapse; Masonry B seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames cracked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	Extreme Damage	Very Violent	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI			Rails bent greatly. Underground pipelines completely out of service.
XII			Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together using steel, concrete, etc.; designed to resist lateral forces.

Masonry B: Good workmanship and mortar; reinforced, but not designed to in detail to resist lateral forces.

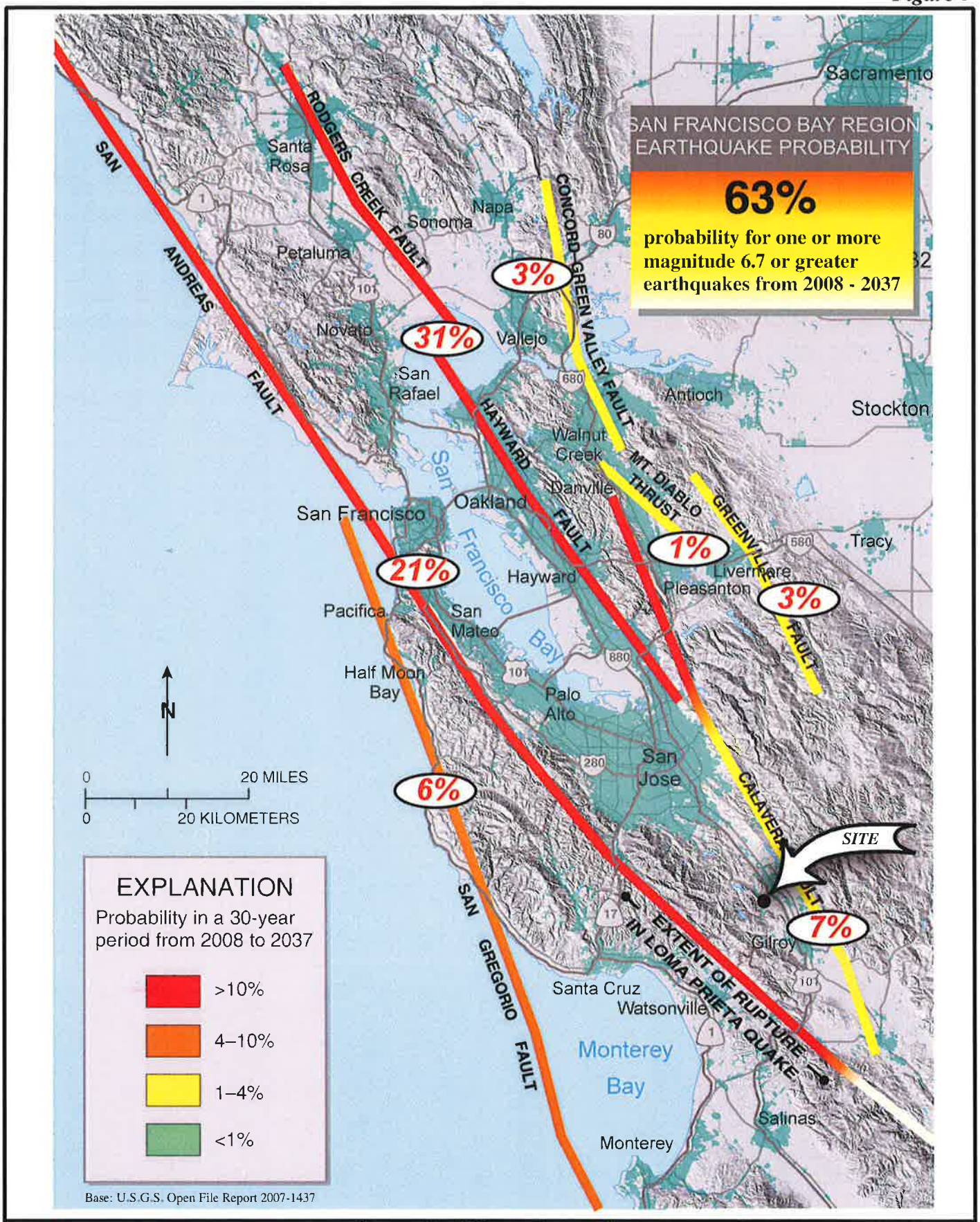
Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.

Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

Source: Association of Bay Area Governments (2003)

Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Modified Mercalli Intensity Scale** **SH-11788-SA**

Figure 8



Earth Systems Pacific	**Quail Vineyards** **14905 Santa Teresa Boulevard** **Morgan Hill, California**	**Earthquake Probability** **SH-11788-SA**

LEGEND

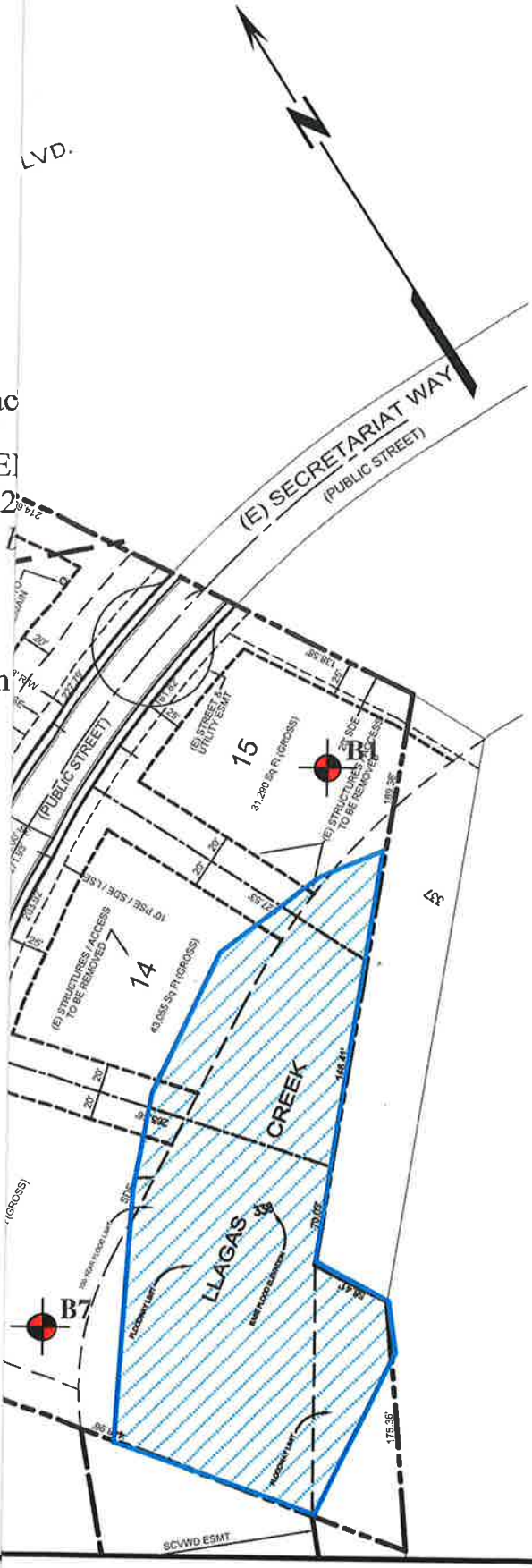
Qhf Holocene fan deposits

Qpf Pleistocene fan deposits

— — Approximate geologic contac

Areas within Zone AE on FE
Flood-Insurance Rate Map (2
(areas subject to inundation b
annual chance flood)
See Figure 10

B7 Approximate boring location

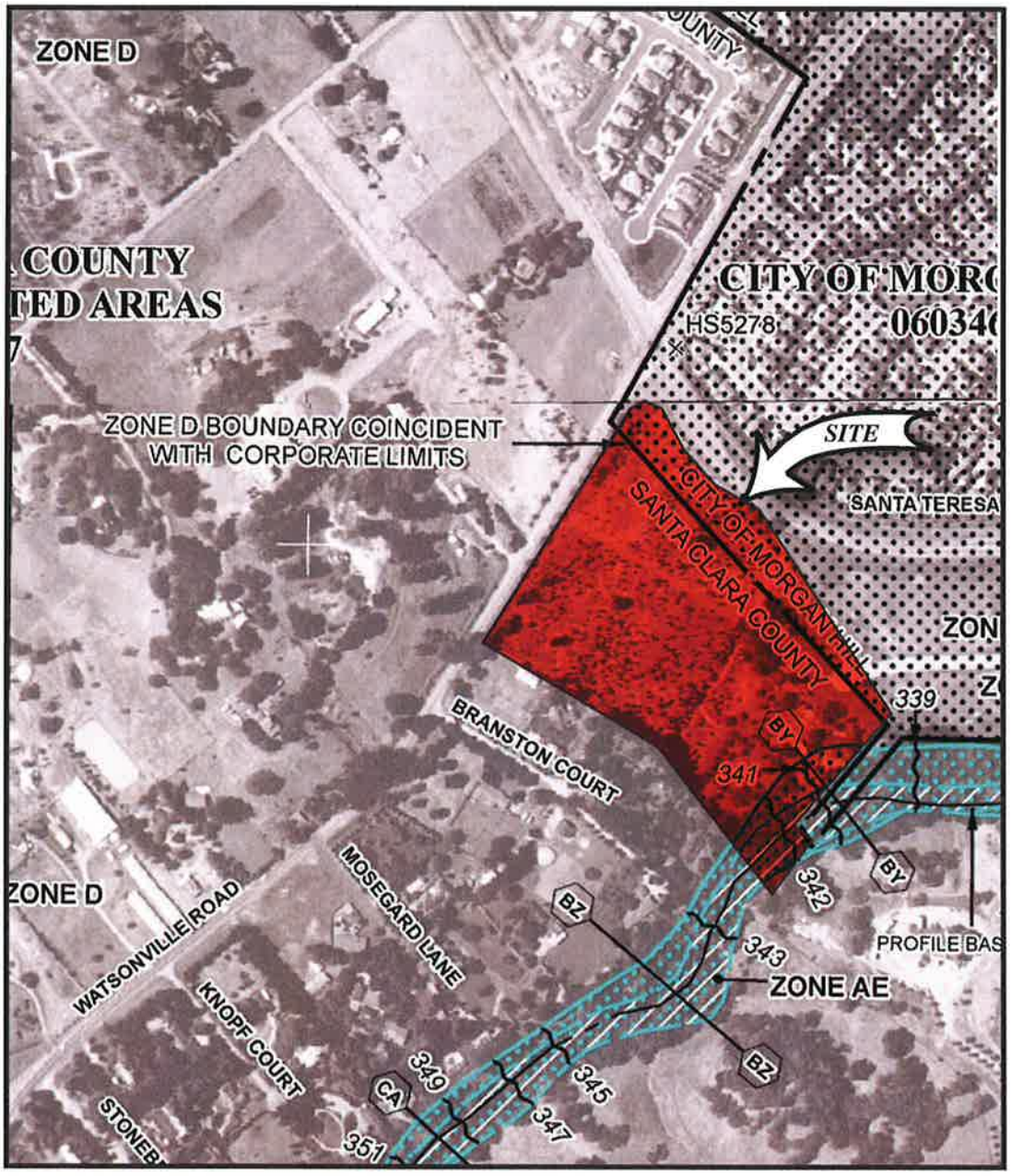


Base: Precise Development Plan - Quail Vineyards - HMH (2011)
Geology: McLaughlin et al, 2001 and ESP (this study)

Earth Systems Pacific

et

SH-11788-SA



Base: FEMA (2009; Panel 06001C 0607H and 0609H)

ZONE AE	SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD	Base Flood Elevations determined.
ZONE X	OTHER FLOOD AREAS	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
ZONE D		Areas where flood risk is undetermined, but possible

500 0 500

Approximate Scale in Feet

Earth Systems Pacific	Quail Vineyards 14905 Santa Teresa Boulevard Morgan Hill, California	**FEMA Flood Insurance Rate Map** **SH-11788-SA**

APPENDIX A

Boring Logs (7)

Earth Systems Pacific

Boring No. 1

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown lean clay with sand, fine sand fraction, moist, hard	0.5–2.0	1–1	■	108.6	16.1	76	4.5
5	CL		–becoming more brown	3.5–5.0	1–2	■	109.7	19.5	50	4.5
10	CL		–changing to light brown, increasing sand fraction to sandy lean clay	8.5–10.0	1–3	■	105.6	22.9	78	–
12			▼							
12	GW–GC		–gravels encountered							
15	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, wet, medium dense	13.5–15.0	1–4	■	128.0	11.8	53	–
20	GW–GC			18.5–20.0	1–5	●	–	14.0	45	–
23	GC–SC		Brown clayey gravel with sand to clayey sand with gravel, wet, medium dense to dense	23.5–25.0	1–6	●	–	11.3	50/6	–
25	GC–SC		–decreasing gravels							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 1
PAGE 2 OF 2
JOB NO.: SH-11788-SA
DATE: 05/21/12

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
27	GC–SC		(see previous description)							
28										
29	SP–SC		Light brown poorly graded sand with clay and gravel to clayey sand with gravel, wet, dense	28.5–30.0	1–7	●	–	19.3	54	
30										
31										
32			–slow drilling Dark gray shale, very hard							
33										
34			End of Boring @ 33.5' Free subsurface water @ 13.5'	33.5–33.7	1–8	●	–	–	50/1	
35										
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53										

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 2
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown lean clay with sand, moist, hard	0.5–2.0	2–1	■	101.0	15.6	34	4.0
5			–lighter brown	3.5–5.0	2–2	■	111.0	17.6	35	3.5
10	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, moist, medium dense	8.5–10.0	2–3	■	113.3	6.4	53	–
15	SC		Brown clayey sand, trace fine and coarse gravels, wet, medium dense to dense	13.5–15.0	2–4	■	124.2	14.2	47	–
			End of Boring @ 15.0' Free subsurface water @ 12.5'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 3
PAGE 1 OF 1

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0–4	CL		Dark brown to brown sandy lean clay, trace fine gravels, sand fraction fine to medium, moist, hard	0.5–2.0	3–1	■	106.4	12.5	48	4.0
4–8	SP–SC		Brown poorly graded sand with clay to clayey sand, moist to very moist, loose	3.5–5.0	3–2	■	98.1	12.2	17	3.5
8–13	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, wet, medium dense	8.5–10.0	3–3	■	127.4	8.4	35	–
13–20			–cobbles encountered, sandy clay lenses present	13.5–15.0	3–4	■	123.4	15.2	50/3	–
				18.5–20.0	3–5	■	–	12.6	70	–
20			End of Boring @ 20.0' Free subsurface water @ 13.5'							

LEGEND: ■ 2.5" Mod Cal Sample ◯ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 4
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Brown sandy lean clay, moist, very stiff	0.5–2.0	4–1	■	115.4	16.0	28	4.25
5			–more moist, with trace rounded gravels	3.5–5.0	4–2	■	117.3	12.2	19	–
10	SP–SC		Brown poorly graded sand with clay, very moist, medium dense	8.5–10.0	4–3	■	106.3	10.3	36	–
15	GW–GC		Gray–brown well graded gravels with clay and sand to clayey gravels with sand, gravel fraction fine to coarse, sand fraction medium to coarse, moist, medium dense –cobble at end of sample	13.5–15.0	4–4	■	146.6	12.2	50/5	–
			End of Boring @ 15.0' Free subsurface water @ 12.0'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 5
PAGE 1 OF 1

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown to brown lean clay with sand, sand fraction fine to medium, moist, hard	0.5–2.0	5–1	■	105.4	20.2	41	4.0
5			–lighter brown in color, increasing sand, more moist	3.5–5.0	5–2	■	110.2	19.9	44	2.75
7	SC–GC		–increasing sand content Dark brown to brown clayey sand with gravel to clayey gravel with sand, sand fraction medium to coarse, gravel fraction fine to coarse, very moist, dense	8.5–10.0	5–3	■	113.5	18.8	50/5	–
15			–as above with sand lenses, wet, dense	13.5–15.0	5–4	■	106.9	25.4	50/5	–
17	CL–SC		–slow drilling Brown sandy clay to clayey sand with clasts of dark gray shale, moist	18.5–20.0	5–5	■	–	–	54	–
20			End of Boring @ 20.0' Free subsurface water @ 12.0'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

Boring No. 6
PAGE 1 OF 1
JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CL		Dark brown lean clay with sand, trace gravel, moist, hard	0.5–2.0	6–1	■	112.9	12.6	69	4.5
4			–increase coarse gravel							
5	CL–SC		Reddish brown to brown sandy clay to clayey sand, very moist	3.5–5.0	6–2	■	107.4	7.9	31	–
9	GC–SC		Yellowish brown clayey gravel with sand to clayey sand with gravel, trace cobbles, very moist, medium dense	8.5–10.0	6–3	■	116.5	7.7	42	–
12			▼							
13	GP–SP		Poorly graded sands to gravels, slight clay, wet, dense,							
15			End of Boring @ 15.0'	13.5–15.0	6–4	■	134.3	4.0	50/3	–
			Free subsurface water @ 12'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 7

LOGGED BY: X. Mejia
DRILL RIG: Mobile B-53
AUGER TYPE: Hollow Stem

JOB NO.: SH-11788-SA
DATE: 5/21/12

Quail Vineyards
14905 Santa Teresa Boulevard
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 12 IN.	POCKET PEN (t.s.f)
0	CH		Brown to slightly reddish–brown clay with sand, fine sand fraction, moist, hard							
5			–more gray–brown with black spotting	3.5–5.0	7–1	■	113.1	16.8	48	4.5
10	CL		Gray–brown sandy clay, trace black spots and streaks, very moist, very stiff	8.5–10.0	7–2	■	103.3	22.3	36	–
12			▼							
13	SC		–gravels encountered							
15			Clayey sand with gravel, wet, medium dense	13.5–15.0	7–3	■	114.1	19.9	48	–
18	GC–SC		Gray–brown clay gravels with sand to clayey sand with gravels, gravel fraction fine to coarse, sand fraction coarse, wet, medium dense	18.5–20.0	7–4	●	–	20.7	45	–
21			–slow drilling, cobbles and increased gravels encountered							
23			Dark gray shale, very hard	23.5–24.5	7–5	●	–	–	50/3	–
24				24.5–	7–6	●	–	–	50/1	–
25			Drill refusal @ 24.5'							
26			Free subsurface water @ 12.0'							

LEGEND: ■ 2.5" Mod Cal Sample ○ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

Quail Vineyards Subdivision

SH-11788-SA
June, 2012

BULK DENSITY & MOISTURE TEST RESULTS

ASTM D 2937-10 (modified for ring liners)

SAMPLE NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
B1-1	1.5 - 2.0	16.1	126.1	108.6
B1-2	4.5 - 5.0	19.5	131.2	109.7
B1-3	9.5 - 10.0	22.9	129.8	105.6
B1-4	14.5 - 15.0	11.8	143.1	128.0
B1-5	19.5 - 20.0	14.0	---	---
B1-6	24.5 - 25.0	11.3	---	---
B1-7	29.5 - 30.0	19.3	---	---
B2-1	2.0 - 2.5	15.6	116.8	101.0
B2-2	4.5 - 5.0	17.6	130.6	111.0
B2-3	9.5 - 10.0	6.4	120.5	113.3
B2-4	14.5 - 15.0	14.2	141.8	124.2
B3-1	1.5 - 2.0	12.5	119.7	106.4
B3-2	4.5 - 5.0	12.2	110.1	98.1
B3-3	9.5 - 10.0	8.4	138.1	127.4
B3-4	14.0 - 14.5	15.2	142.1	123.4
B3-5	19.5 - 20.0	12.6	---	---
B4-1	1.5 - 2.0	16.0	133.8	115.4
B4-2	4.5 - 5.0	12.2	131.7	117.3
B4-3	9.5 - 10.0	10.3	117.3	106.3
B4-4	14.5 - 15.0	12.2	164.8	146.8
B5-1	1.5 - 2.0	20.2	126.6	105.4
B5-2	4.5 - 5.0	19.9	132.1	110.2
B5-3	9.5 - 10.0	18.8	134.8	113.5
B5-4	14.0 - 14.5	25.4	134.0	106.9
B5-5	9.5 - 10.0	9.6	---	---
B6-1	1.5 - 2.0	12.6	127.2	112.9
B6-2	4.5 - 5.0	7.9	115.9	107.4
B6-3	9.5 - 10.0	7.7	125.5	116.5
B6-4	14.0 - 14.5	4.0	139.7	134.3
B7-1	1.5 - 2.0	16.8	132.0	113.1
B7-2	4.5 - 5.0	22.3	126.3	103.3
B7-3	9.5 - 10.0	19.9	136.7	114.1
B7-4	14.0 - 14.5	20.7		

PLASTICITY INDEX TEST RESULTS

ASTM D 4318-10

BORING NO.	DEPTH feet	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	1.5 - 2.0	40	13	27

R-VALUE TEST RESULTS

ASTM D 2844-07/CAL Test 301

BORING NO.	DEPTH feet	R-VALUE	SOIL CLASSIFICATION
Bag A	0.5 - 2.5	26	Red brown lean CLAY with sand (CL)

Quail Vineyards Subdivision

SH-11788-SA

June, 2012

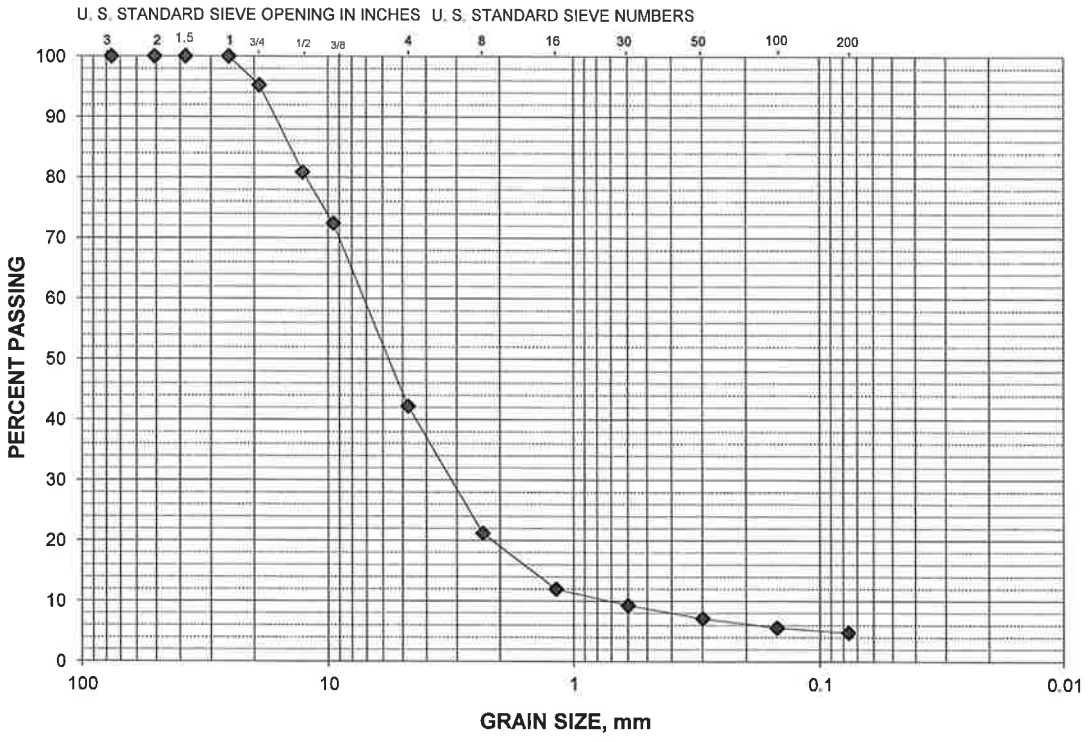
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-1 @ 14.5' - 15.0'

Well graded GRAVEL with silt and sand (GW-GM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	5	95
1/2"	19	81
3/8"	28	72
#4	58	42
#8	79	21
#16	88	12
#30	91	9
#50	93	7
#100	94	6
#200	95	5



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

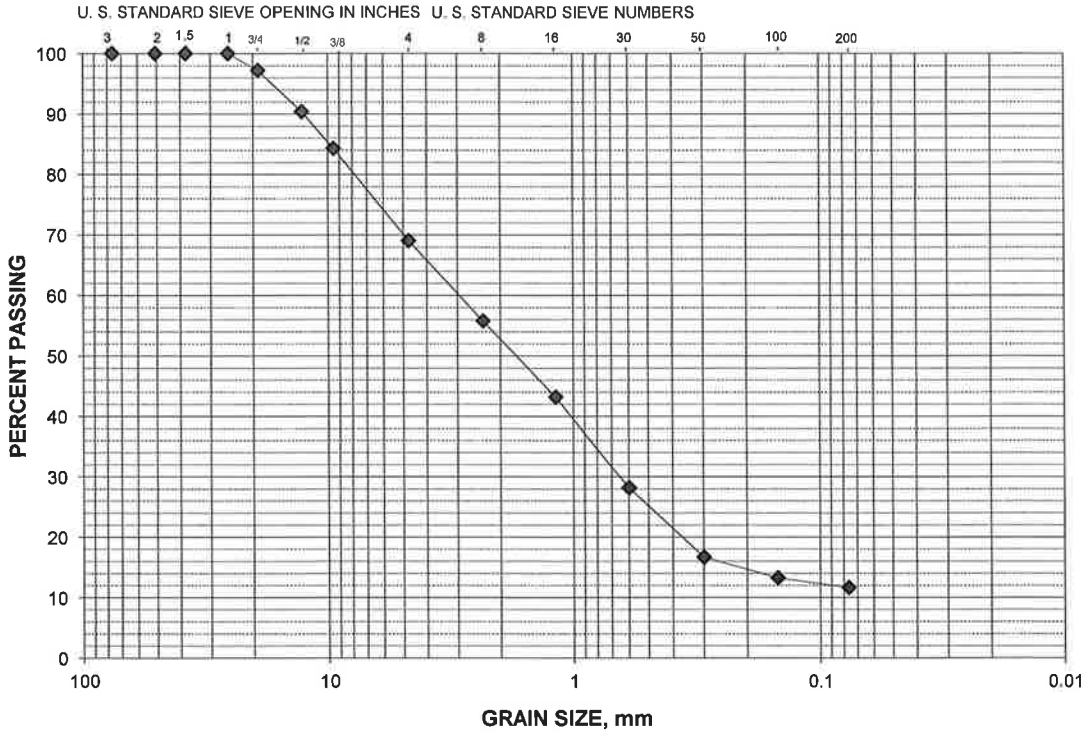
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-1 @ 29.5' - 30.0'

Poorly graded SAND with silt and gravel (SP-SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	3	97
1/2"	10	90
3/8"	16	84
#4	31	69
#8	44	56
#16	57	43
#30	72	28
#50	83	17
#100	87	13
#200	88	12



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

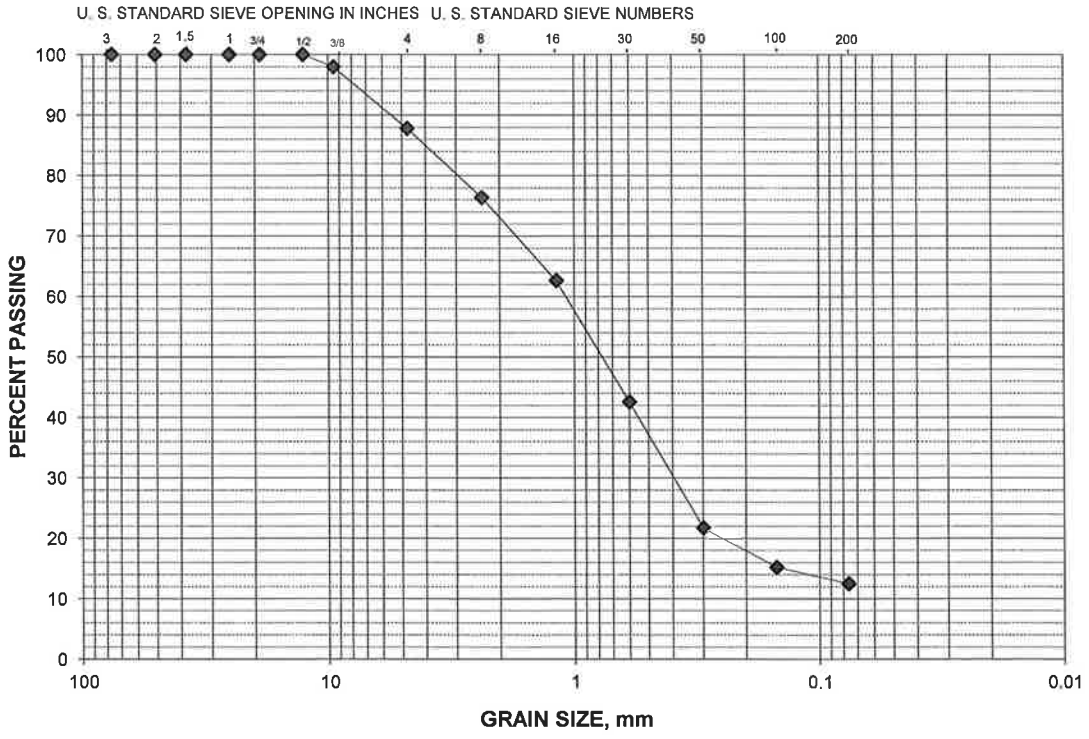
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-3 @ 4.5' - 5.0'

Poorly graded SAND with silt (SP-SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	2	98
#4	12	88
#8	24	76
#16	37	63
#30	57	43
#50	78	22
#100	85	15
#200	88	12



Quail Vineyards Subdivision

SH-11788-SA
June, 2012

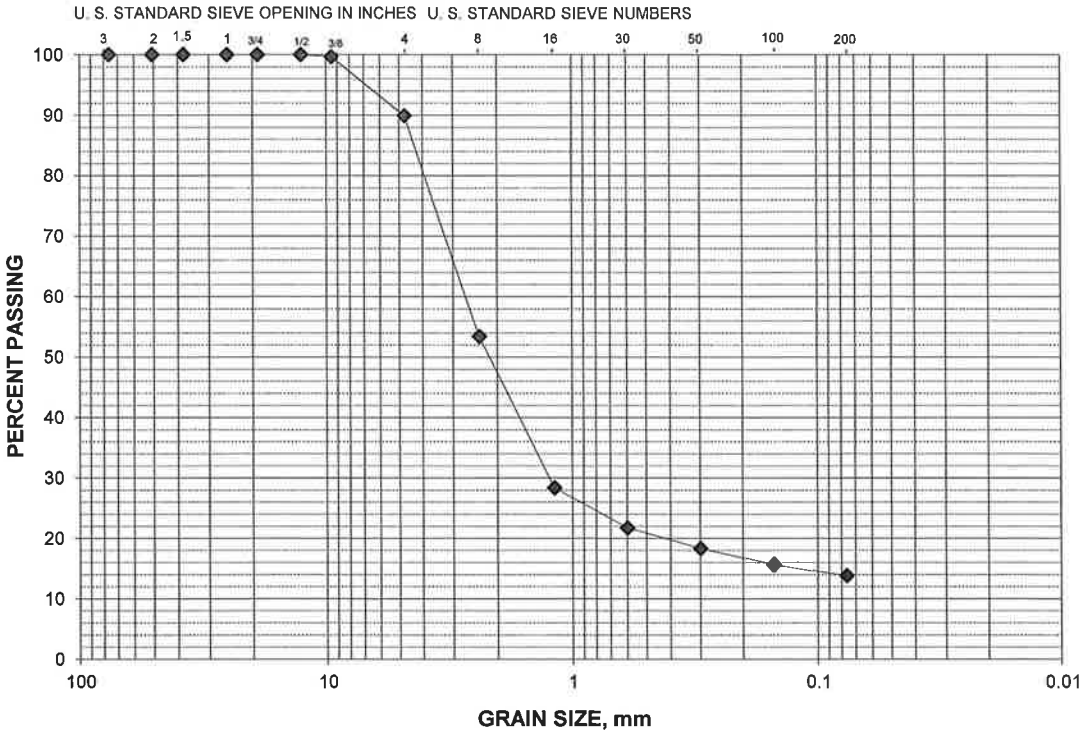
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-4 @ 9.5' - 10.0'

Poorly graded SAND with silt (SP-SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	0	100
#4	10	90
#8	47	53
#16	72	28
#30	78	22
#50	82	18
#100	84	16
#200	86	14



Quail Vineyards Subdivision

SH-11788-SA

June, 2012

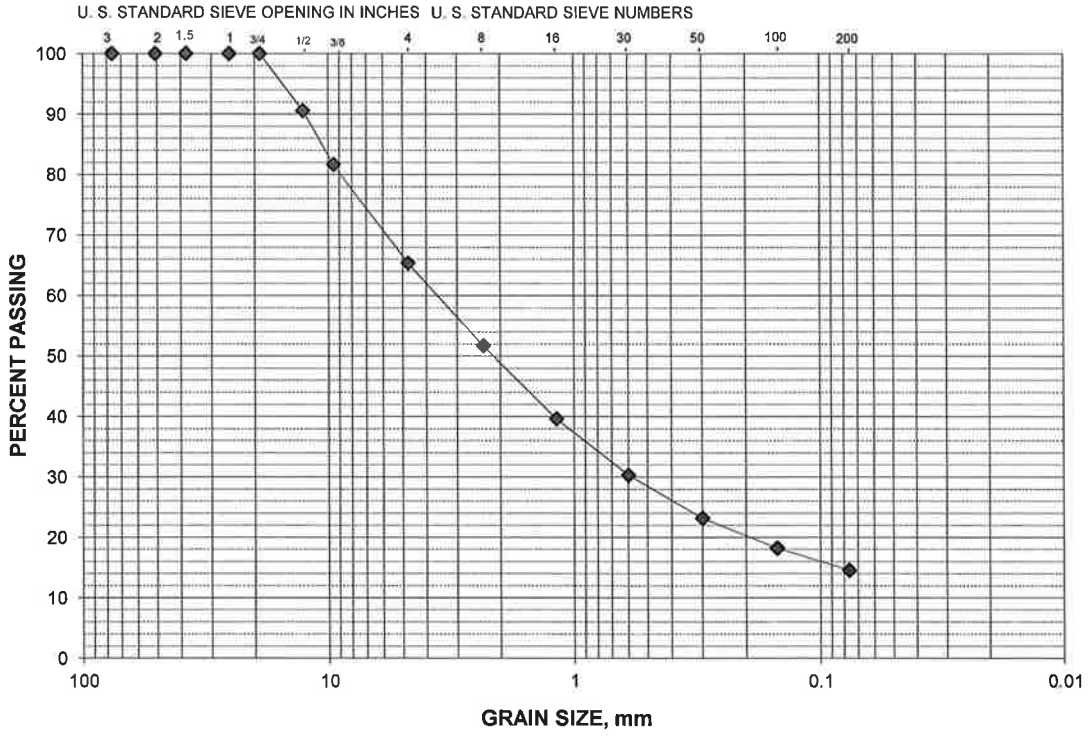
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-06

B-7 @ 9.5' - 10.0'

Silty SAND with gravel (SM)

Sieve size	% Retained	% Passing
3"	0	100
2"	0	100
1.5"	0	100
1"	0	100
3/4"	0	100
1/2"	9	91
3/8"	18	82
#4	35	65
#8	48	52
#16	60	40
#30	70	30
#50	77	23
#100	82	18
#200	85	15



Quail Vineyards Subdivision SH-11788-SA

DIRECT SHEAR

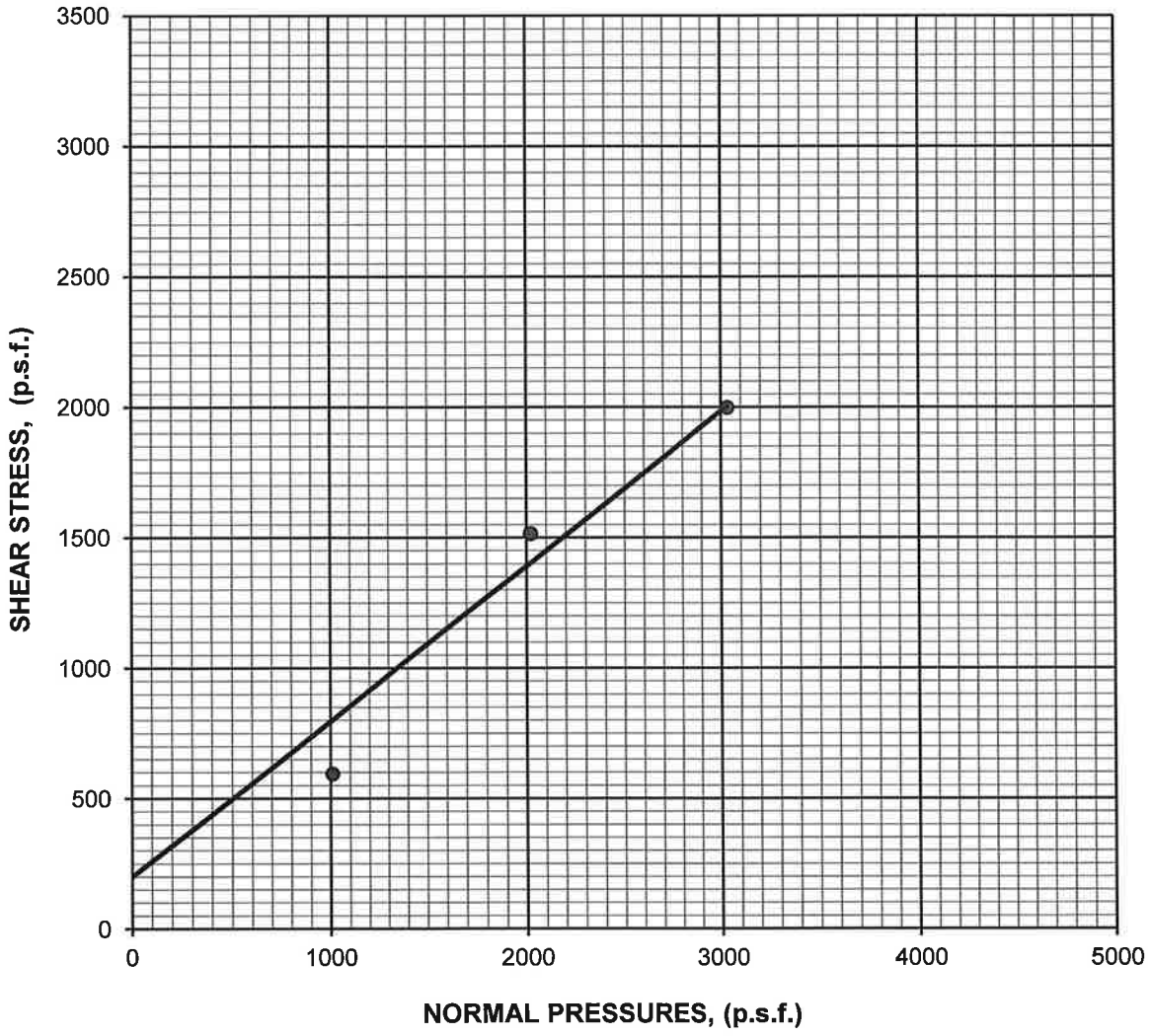
ASTM D 3080/D3080M-11

June, 2012

B-2 @ 1.5' - 2.0'
Lean CLAY with sand (CL)

INITIAL AVG DRY DENSITY: 101.0 pcf
INITIAL AVG MOISTURE CONTENT: 15.6 %
PEAK SHEAR ANGLE (Ø): 26°
COHESION (C): 300 psf

SHEAR STRESS vs. NORMAL PRESSURES



DIRECT SHEAR continued

ASTM D 3080/D3080M-11

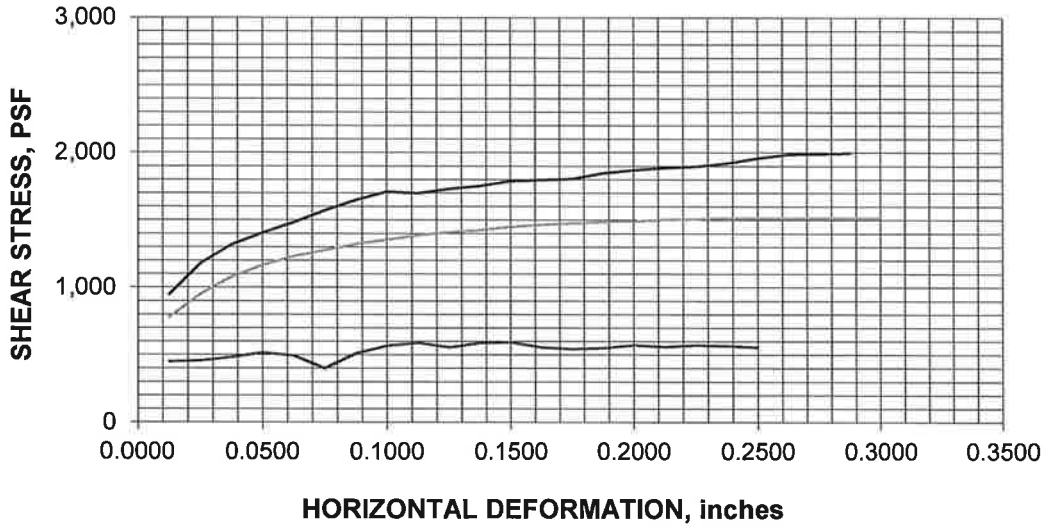
June, 2012

B-2 @ 1.5' - 2.0'

Lean CLAY with sand (CL)

0 SPECIFIC GRAVITY: 2.75 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	14.5	16.2	16.2	15.6
DRY DENSITY, pcf	101.8	100.1	101.1	101.0
SATURATION, %	58.2	62.4	64.0	61.5
VOID RATIO	0.686	0.714	0.697	0.699
DIAMETER, inches	2.37	2.37	2.37	
HEIGHT, inches	1.000	1.000	1.000	
AT TEST				
WATER CONTENT, %	21.9	23.5	23.3	22.9
DRY DENSITY, pcf	97.9	112.6	115.1	108.5
SATURATION, %	100.0	100.0	100.0	100.0
VOID RATIO	0.754	0.524	0.491	0.590
HEIGHT, inches	1.020	0.943	0.937	



Quail Vineyards Subdivision SH-11788-SA

DIRECT SHEAR

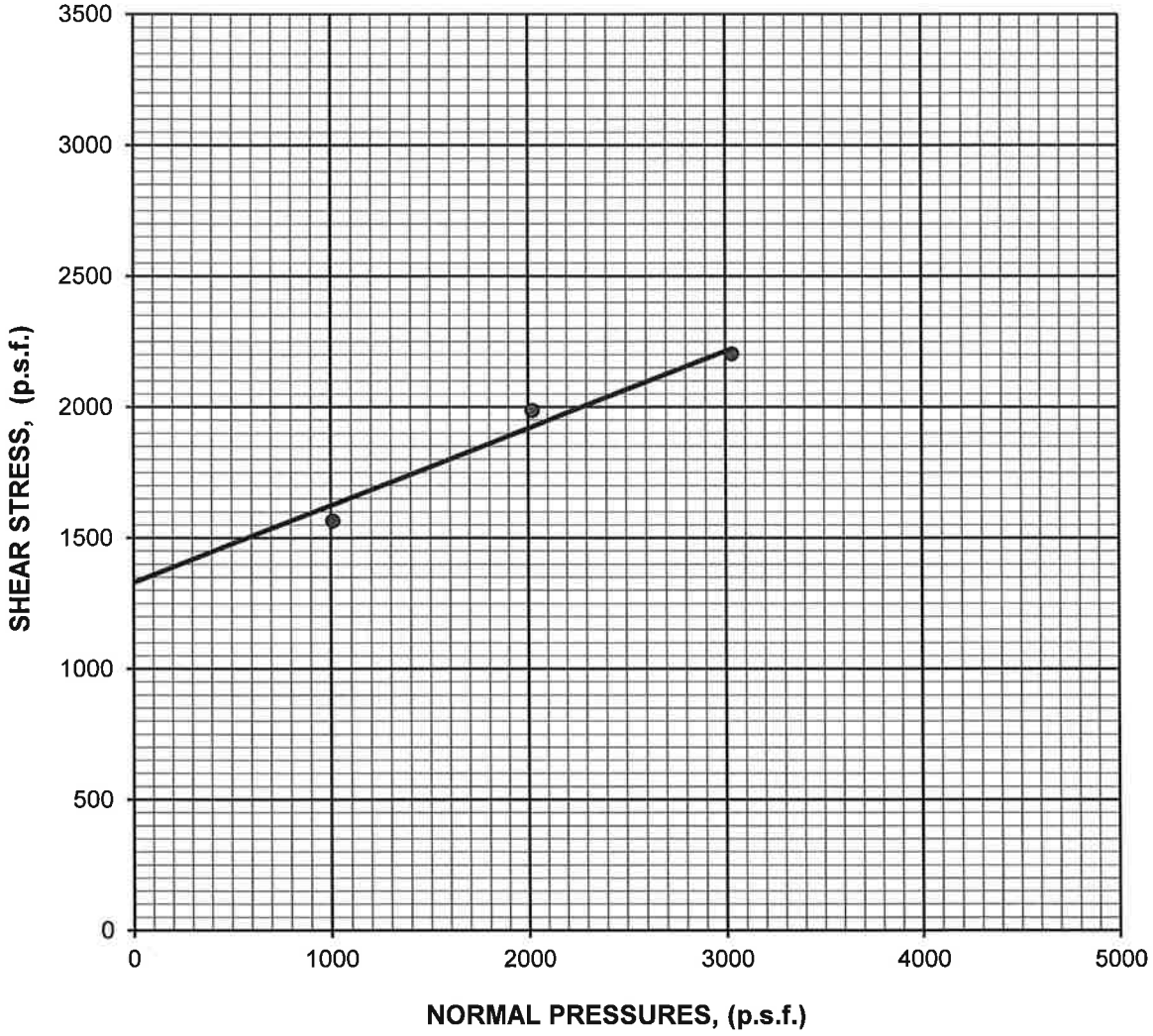
ASTM D 3080/D3080M-11

June, 2012

B-5 @ 4.5' - 5.0'
Lean CLAY with sand (CL)

INITIAL AVG DRY DENSITY: 110.2 pcf
INITIAL AVG MOISTURE CONTENT: 19.9 %
PEAK SHEAR ANGLE (Ø): 15°
COHESION (C): 1350 psf

SHEAR STRESS vs. NORMAL PRESSURES



DIRECT SHEAR continued

ASTM D 3080/D3080M-11

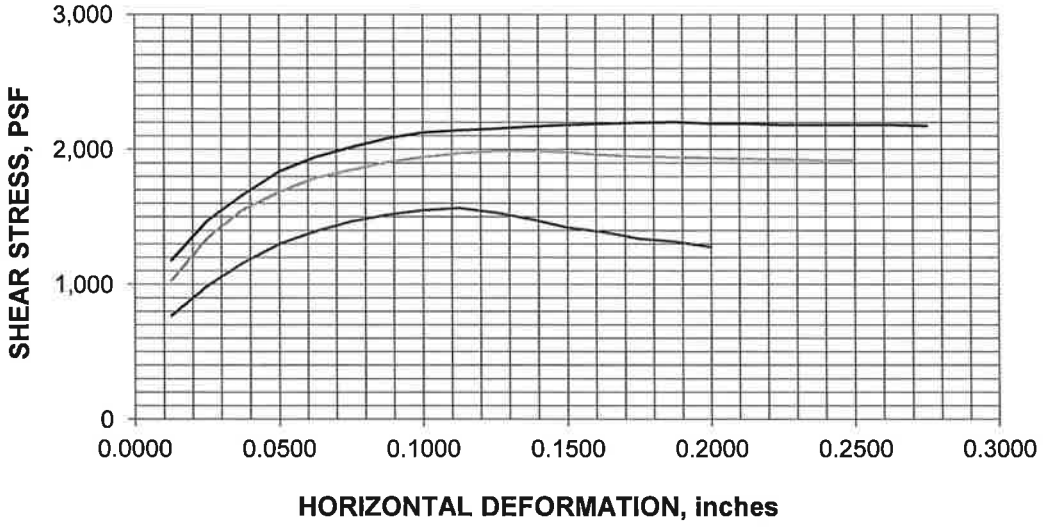
June, 2012

B-5 @ 4.5' - 5.0'

Lean CLAY with sand (CL)

0 SPECIFIC GRAVITY: 2.75 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	18.7	19.9	21.0	19.9
DRY DENSITY, pcf	111.7	109.9	109.1	110.2
SATURATION, %	95.8	97.4	100.0	98.0
VOID RATIO	0.537	0.562	0.572	0.557
DIAMETER, inches	2.37	2.37	2.37	
HEIGHT, inches	1.000	1.000	1.000	
AT TEST				
WATER CONTENT, %	20.8	22.0	23.4	22.1
DRY DENSITY, pcf	115.6	117.2	120.5	117.8
SATURATION, %	100.0	100.0	100.0	100.0
VOID RATIO	0.484	0.465	0.424	0.458
HEIGHT, inches	0.983	0.968	0.952	



APPENDIX C

Liquefaction Analysis

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B1 Data Set: 1

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 7.9 7.5
PGA, g: 0.57 0.65
MSF: 0.88
GWT: 8.0 feet
Calc GWT: 8.0 feet
Remediate to: 0.0 feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

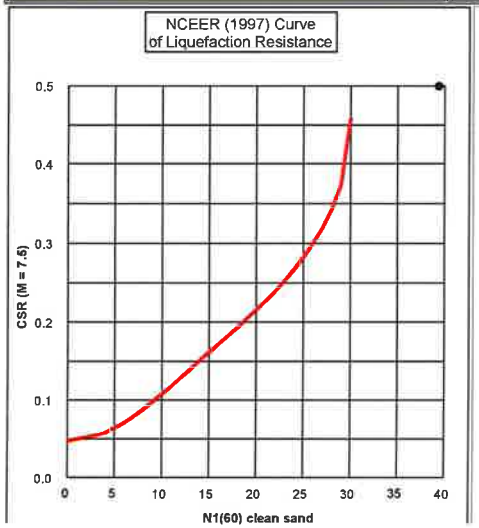
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.0 upper 50 ft

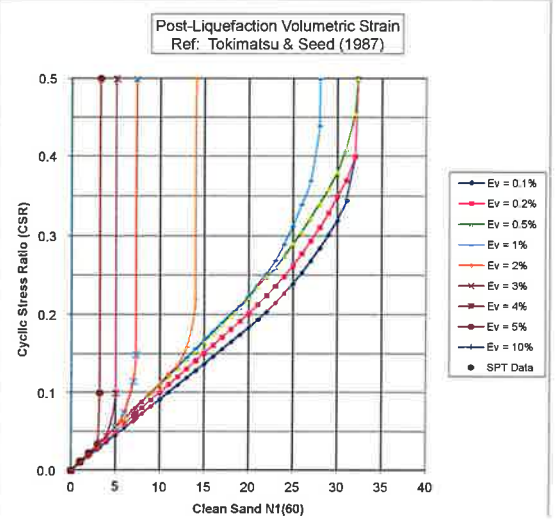
Required SF: 1.00
Threshold Acceler., g: 1.14 **Minimum Calculated SF:** 2.00

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																									
3.0	76	48		120	95	0.5	3.5	0.030	0.030	1.00	1.00	0.75	1.00	41.3				1.00	Infin.	0.423	Non-Liq.		41.3	0.00	0.00	0.020						
8.0	50	32		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	27.2				1.00	Infin.	0.419	Non-Liq.		27.2	0.00	0.00	0.201						
12.0	78	49		120	95	9.5	12.5	0.570	0.523	0.98	1.00	0.75	1.00	42.4				1.00	Infin.	0.452	Non-Liq.		42.4	0.00	0.00	0.382						
17.5	53	33	1	130	5	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	39.3	75	0.0	39.3	1.00	1.200	0.517	2.32	0.0	39.3	0.00	0.00	0.610	1,187	0.327	6.2E-04			
23.0		45	1	130	5	19.5	22.5	1.268	0.909	0.96	1.08	0.93	1.00	51.8	86	0.0	51.8	1.00	1.200	0.566	2.12	0.0	51.8	0.00	0.00	0.849	1,536	0.450	5.7E-04			
28.0		100	1	130	12	25.0	28.0	1.625	1.095	0.94	0.98	0.98	1.00	####	###	5.1	116.3	0.99	1.200	0.600	2.00	5.1	116.3	0.00	0.00	1.089	2,276	0.567	3.8E-04			





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))^0.5))
C_N = (1 atm/p'o)^0.5, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)cs}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)^(-0.8)
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)cs}$/20)^-1.2
E_{nc} = (Nc/15)^0.45*E15

Nc = (MAG-4)^2.17
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs}$ = $N_{1(60)cs}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)^(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)
Dr = ($N_{1(60)}$/70)^0.5
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B2 Data Set: 2

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 7.9 7.5
PGA, g: 0.57 0.65
MSF: 0.88
GWT: 8.0 feet
Calc GWT: 8.0 feet
Remediate to: 0.0 feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

Total (ft) Liquefied Thickness	Total (in.) Induced Subsidence
0	0.0

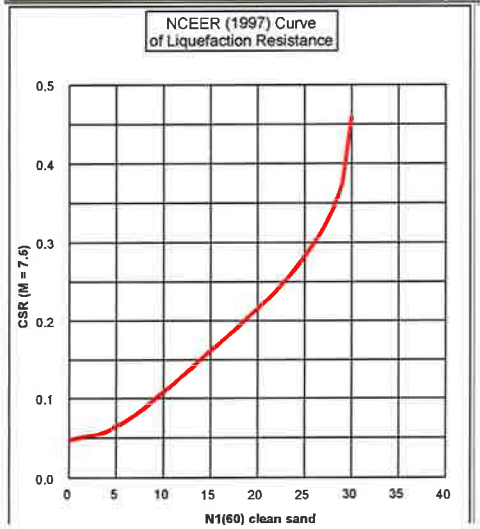
upper 50 ft

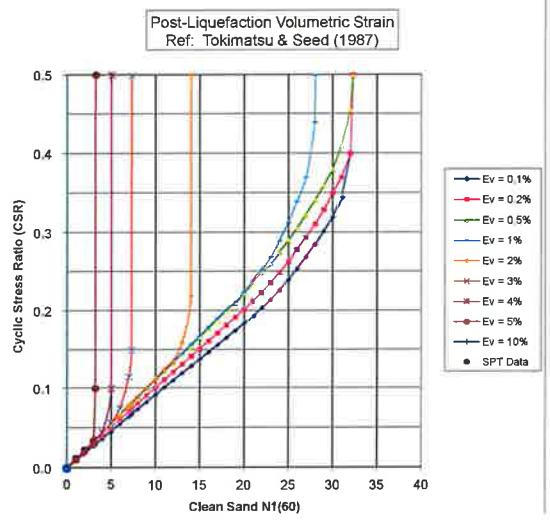
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Threshold Acceler., g: 1.31 **Required SF:** 1.00
Minimum Calculated SF: 2.29

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																									
2.5	34	21		120	95	2.0	5.0	0.120	0.120	1.00	1.00	0.75	1.00	18.5				1.00	Infin.	0.422	Non-Liq.		18.5	0.00	0.00	0.080						
7.5	35	22		130	95	5.0	8.0	0.325	0.325	0.99	1.00	0.75	1.00	19.0				1.00	Infin.	0.419	Non-Liq.		19.0	0.00	0.00	0.218						
8.0	53	33	1	130	10	7.7	10.7	0.501	0.501	0.98	1.45	0.75	1.00	41.9	77	1.8	43.6	1.00	1.200	0.417	Non-Liq.	1.8	43.6	0.04	0.00	0.335	911	0.182	4.6E-04	1.8E-04	2.0E-04	0.00
12.5	53	33	1	130	10	9.5	12.5	0.618	0.571	0.98	1.36	0.75	1.00	39.2	75	1.7	40.9	1.00	1.200	0.449	2.67	1.7	40.9	0.00	0.00	0.414	991	0.224	5.2E-04			
15.0	47	45	1	130	12	14.5	17.5	0.943	0.740	0.97	1.20	0.86	1.00	52.9	87	3.2	56.2	1.00	1.200	0.523	2.29	3.2	56.2	0.00	0.00	0.631	1,360	0.339	4.8E-04			
		100					3.0			1.00		0.75	1.00	0.0										#######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
$MSF = 10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
$G_{max} = 447*N_{1(60)cs}^{(1/3)}*p^{0.5}$
a = 0.0389*(p/1)+0.124
$b = 6400*(p/1)^{(-0.6)}$
$\gamma = [1+a*EXP(b*\tau_{av}/G_{max})]/[(1+a)*\tau_{av}/G_{max}]$
$E_{15} = \gamma*(N_{1(60)cs}/20)^{-1.2}$
$E_{nc} = (Nc/15)^{0.45}*E15$

$Nc = (MAG-4)^{2.17}$
$S = 2*H*E_{nc}$

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs} = N_{1(60)cs} + \Delta N_{1(60)}$
Kσ = min of 1.0 or $(p'o/1.058)^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
$Dr = (N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B3 Data Set: 3

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** **feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

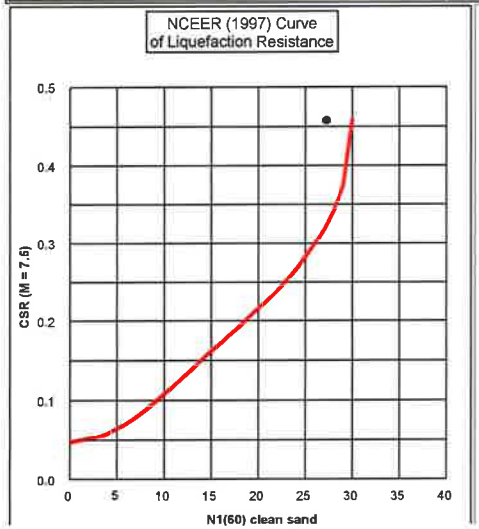
Total (ft) Liquefied Thickness: 4
Total (in.) Induced Subsidence: 0.7 upper 50 ft

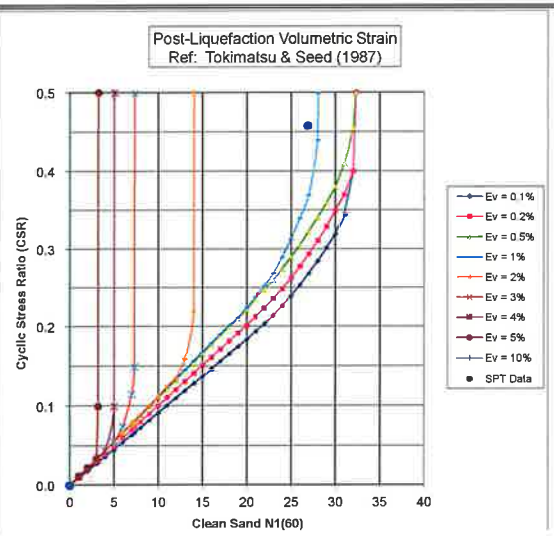
Required SF: 1.00
Threshold Acceler., g: 0.40 **Minimum Calculated SF:** 0.71

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	*Trigger FC Adj.* $\Delta N_{1(60)}$	*Equiv. Sand* $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	**Liquefac. Safety Factor**	*Post FC Adj.* $\Delta N_{1(60)}$	$N_{1(60)cs}$	Volumetric *Strain (%)*	**Induced Subsidence (in.)**	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	**Dry Sand Subsidence (in.)**
								0.000																								
4.0	48	**30**		120	95	2.0	5.0	0.120	0.120	1.00	1.00	0.75	1.00	26.1				1.00	Infin.	0.422	**Non-Liq.**		26.1	0.00	**0.00**	0.080						
8.0	17	**11**	1	130	10	5.0	8.0	0.325	0.325	0.99	1.70	0.75	1.00	15.7	47	1.2	16.9	1.00	0.183	0.419	**Non-Liq.**	1.2	16.9	0.30	**0.15**	0.218	535	0.119	1.1E-03	1.4E-03	1.5E-03	**0.15**
12.0	35	**22**	1	130	10	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	25.8	61	1.4	27.2	1.00	0.324	0.459	**0.71**	1.0	26.8	1.09	**0.52**	0.436	887	0.236	7.7E-04			
16.0	100	**63**	1	130	10	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	74.2	###	2.5	76.7	1.00	1.200	0.517	**2.32**	2.5	76.7	0.00	**0.00**	0.610	1,483	0.327	3.8E-04			
20.0	70	**45**	1	130	10	18.0	21.0	1.170	0.858	0.96	1.11	0.91	1.00	52.2	86	2.0	54.2	1.00	1.200	0.555	**2.16**	2.0	54.2	0.00	**0.00**	0.784	1,498	0.417	5.3E-04			
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
$G_{max} = 447*N_{1(60)cs}^{(1/3)}*p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
$E_{15} = \gamma*(N_{1(60)cs}/20)^{-1.2}$
$E_{nc} = (Nc/15)^{0.4b}*E15$

Nc = $(MAG-4)^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs} = N_{1(60)cs} + \Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = $(N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coyright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B4 Data Set: 4

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** **feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

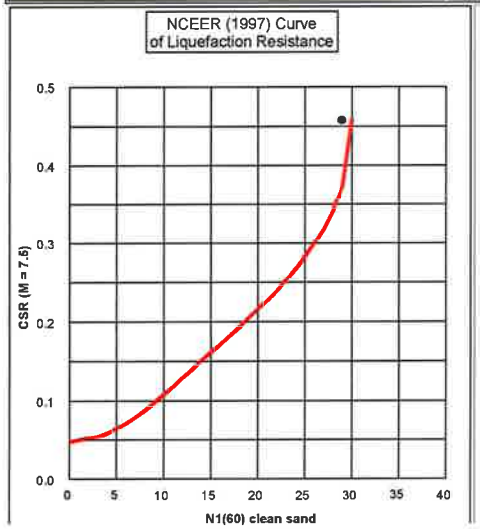
Total (ft) Liquefied Thickness: 4
Total (in.) Induced Subsidence: 0.5 upper 50 ft

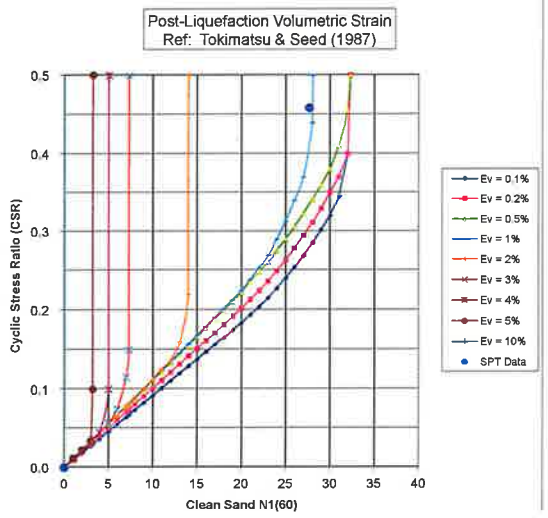
Required SF: 1.00
Threshold Acceler., g: 0.46 **Minimum Calculated SF:** 0.81

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)CS}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
3.0	28	**18**		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	15.2				1.00	Infin.	0.423	**Non-Liq.**		15.2	0.00	**0.00**	0.040						
8.0	19	**12**		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	10.3				1.00	Infin.	0.419	**Non-Liq.**		10.3	0.00	**0.00**	0.201						
12.0	36	**23**	1	130	12	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	26.5	62	2.4	28.9	1.00	0.371	0.459	**0.81**	1.1	27.6	1.03	**0.49**	0.436	905	0.236	7.3E-04			
15.0	60	**38**	1	130	5	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	44.5	80	0.0	44.5	1.00	1.200	0.517	**2.32**	0.0	44.5	0.00	**0.00**	0.610	1,237	0.327	5.6E-04			
		45					3.0			1.00		0.75	1.00	0.0										######								
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)CS}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*$(p/1)^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*$(N_{1(60)CS}/20)^{-1.2}$
E_{nc} = $(Nc/15)^{0.45}$*E15

Nc = $(MAG-4)^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or $(p'o/1.058)^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = $(N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B5 Data Set: 5

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 7.9 7.5
PGA, g: 0.57 0.65
MSF: 0.88
GWT: 8.0 feet
Calc GWT: 8.0 feet
Remediate to: 0.0 feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

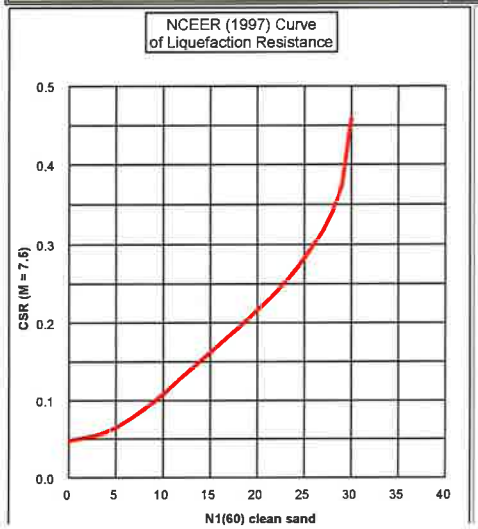
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.0 upper 50 ft

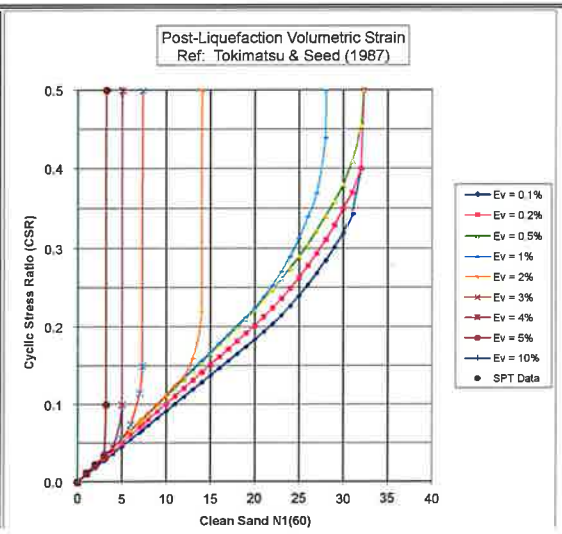
Required SF: 1.00
Threshold Acceler., g: 1.22 **Minimum Calculated SF:** 2.13

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
3.0	41	26		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	22.3				1.00	Infin.	0.423	**Non-Liq.**		22.3	0.00	**0.00**	0.040						
7.0	44	28		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	23.9				1.00	Infin.	0.419	**Non-Liq.**		23.9	0.00	**0.00**	0.201						
8.0	44	28	1	130	12	7.5	10.5	0.488	0.488	0.98	1.47	0.75	1.00	35.2	71	2.7	37.9	1.00	1.200	0.417	**Non-Liq.**	2.7	37.9	0.05	**0.01**	0.327	858	0.178	5.2E-04	2.4E-04	2.7E-04	**0.01**
12.0	60	38	1	130	12	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	44.2	79	2.9	47.1	1.00	1.200	0.459	**2.62**	2.9	47.1	0.00	**0.00**	0.436	1,066	0.236	4.8E-04			
17.0	60	45	1	130	12	15.0	18.0	0.975	0.757	0.97	1.18	0.86	1.00	52.9	87	3.2	56.1	1.00	1.200	0.528	**2.27**	3.2	56.1	0.00	**0.00**	0.653	1,383	0.350	4.9E-04			
20.0	54	100	1	130	30	19.0	22.0	1.235	0.892	0.96	1.09	0.92	1.00	####	###	10.0	125.4	1.00	1.200	0.562	**2.13**	10.0	125.4	0.00	**0.00**	0.827	2,035	0.439	3.2E-04			





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))^0.5))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
$MSF = 10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
$G_{max} = 447*N_{1(60)CS}^{(1/3)}*p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)^(-0.6)
$\gamma = [1+a*EXP(b*\tau_{av}/G_{max})]/[(1+a)*\tau_{av}/G_{max}]$
$E_{15} = \gamma*(N_{1(60)CS}/20)^{-1.2}$
$E_{nc} = (Nc/15)^{0.45}*E15$

Nc = $(MAG-4)^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS} = N_{1(60)CS} + \Delta N_{1(60)}$
Kσ = min of 1.0 or $(p'o/1.058)^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
$Dr = (N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B6 Data Set: 6

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude:	**7.9**	7.5
PGA, g:	**0.57**	0.65
MSF:	0.88	
GWT:	**8.0**	feet
Calc GWT:	**8.0**	feet
Remediate to:	**0.0**	**feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E):	1.00	
Drive Rod Corr. (C_R):	1	Default
Rod Length above ground (feet):	3.0	
Borehole Dia. Corr. (C_B):	1.15	
Sampler Liner Correction for SPT?:	0	No
Cal Mod/ SPT Ratio:	0.63	

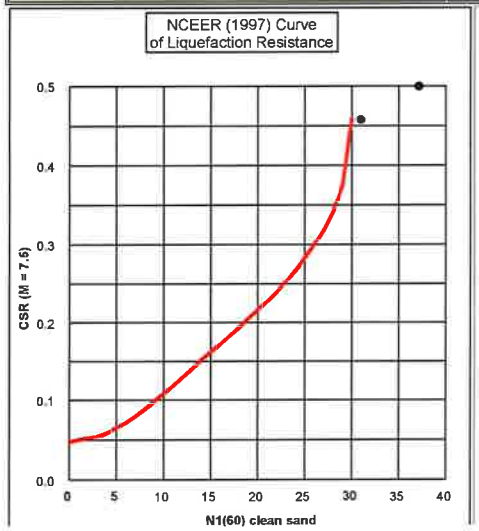
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.3 (upper 50 ft)

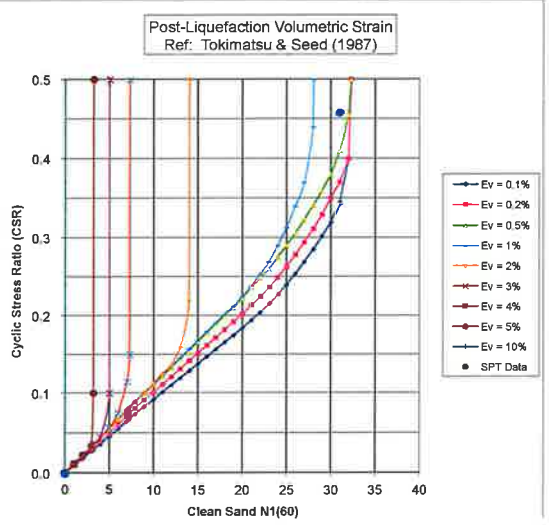
Required SF: 1.00
Threshold Acceler., g: 1.32
Minimum Calculated SF: 2.32

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	Post $N_{1(60)CS}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
4.5	69	**43**		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	37.5				1.00	Infin.	0.423	**Non-Liq.**		37.5	0.00	**0.00**	0.040						
8.0	31	**20**	1	120	40	5.0	8.0	0.300	0.300	0.99	1.70	0.75	1.00	28.6	64	10.0	38.6	1.00	1.200	0.419	**Non-Liq.**	10.0	38.6	0.04	**0.02**	0.201	677	0.110	4.3E-04	2.0E-04	2.2E-04	**0.02**
12.0	42	**26**	1	130	5	10.0	13.0	0.650	0.588	0.98	1.34	0.76	1.00	30.9	66	0.0	30.9	1.00	1.200	0.459	**2.62**	0.0	30.9	0.64	**0.31**	0.436	926	0.236	6.8E-04			
15.0	50	**32**	1	130	5	14.0	17.0	0.910	0.723	0.97	1.21	0.85	1.00	37.1	73	0.0	37.1	1.00	1.200	0.517	**2.32**	0.0	37.1	0.00	**0.00**	0.610	1,164	0.327	6.5E-04			
		45					3.0			1.00		0.75	1.00	0.0										######								
		100					3.0			1.00		0.75	1.00	0.0										######								





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
$C_N = (1\ atm/p'o)^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
$G_{max} = 447*N_{1(60)CS}^{(1/3)}*p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
$\gamma = [1+a*EXP(b*\tau_{av}/G_{max})]/[(1+a)*\tau_{av}/G_{max}]$
$E_{15} = \gamma*(N_{1(60)CS}/20)^{-1.2}$
$E_{nc} = (Nc/15)^{0.45}*E15$

Nc = $(MAG-4)^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS} = N_{1(60)CS} + \Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = $(N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

Coryright & Developed 2007 by Shelton L. Stringer, PE, GE, PG , EG - Earth Systems Southwest

Project: Quail Vineyards
Job No: SH-11788-SA
Date: 9/20/2012
Boring: B7 Data Set: 7

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **7.9** 7.5
PGA, g: **0.57** 0.65
MSF: 0.88
GWT: **8.0** feet
Calc GWT: **8.0** feet
Remediate to: **0.0** feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.15
Sampler Liner Correction for SPT?: 0 No
Cal Mod/ SPT Ratio: 0.63

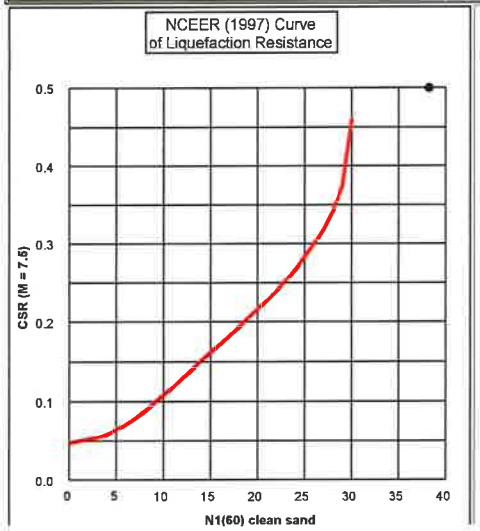
Total (ft) Liquefied Thickness: 0
Total (in.) Induced Subsidence: 0.0 upper 50 ft

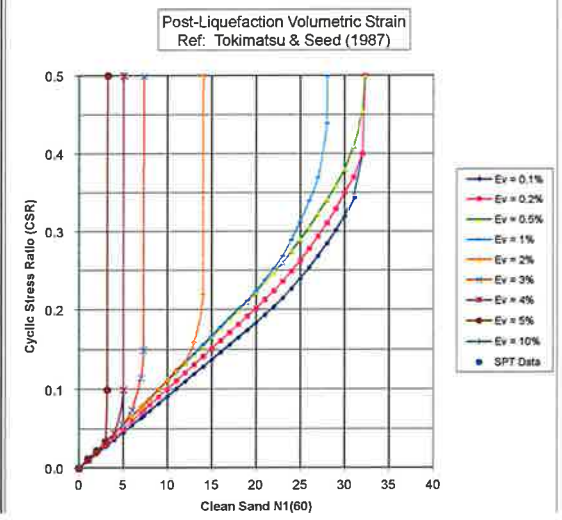
Required SF: 1.00
Threshold Acceler., g: 1.20 **Minimum Calculated SF:** 2.11

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 19.2

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Tot.Stress at SPT po (tsf)	Eff.Stress at SPT p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	Trigger FC Adj. $\Delta N_{1(60)}$	Equiv. Sand $N_{1(60)cs}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	Liquefac. Safety Factor	Post FC Adj. $\Delta N_{1(60)}$	$N_{1(60)cs}$	Volumetric Strain (%)	Induced Subsidence (in.)	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	Dry Sand Subsidence (in.)
								0.000																								
3.0	48	**30**		120	95	1.0	4.0	0.060	0.060	1.00	1.00	0.75	1.00	26.1				1.00	Infin.	0.423	**Non-Liq.**		26.1	0.00	**0.00**	0.040						
8.0	48	**30**		120	95	5.0	8.0	0.300	0.300	0.99	1.00	0.75	1.00	26.1				1.00	Infin.	0.419	**Non-Liq.**		26.1	0.00	**0.00**	0.201						
12.0	36	**23**		120	95	10.0	13.0	0.600	0.538	0.98	1.00	0.76	1.00	19.8				1.00	Infin.	0.463	**Non-Liq.**		19.8	0.00	**0.00**	0.402						
17.0	48	**30**	1	130	12	15.0	18.0	0.975	0.757	0.97	1.18	0.86	1.00	35.5	71	2.7	38.2	1.00	1.200	0.528	**2.27**	2.7	38.2	0.00	**0.00**	0.653	1,217	0.350	6.5E-04			
22.0		**45**	1	130	5	20.0	23.0	1.300	0.926	0.96	1.07	0.93	1.00	51.7	86	0.0	51.7	1.00	1.200	0.569	**2.11**	0.0	51.7	0.00	**0.00**	0.871	1,554	0.461	5.7E-04			
25.0		**100**		130	95	24.0	27.0	1.560	1.061	0.95	1.00	0.97	1.00	####				1.00	Infin.	0.589	**Non-Liq.**		112.1	0.00	**0.00**	1.045						





$N_{1(60)} = C_N*C_E*C_B*C_R*C_S*N$
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
C_N = (1 atm/p'o)$^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)cs}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.8)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)cs}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.45}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)cs}$ = $N_{1(60)cs}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = ($N_{1(60)}$/70)$^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)cs}$

SF = $CRR_{7.5,1atm}$/CSR*

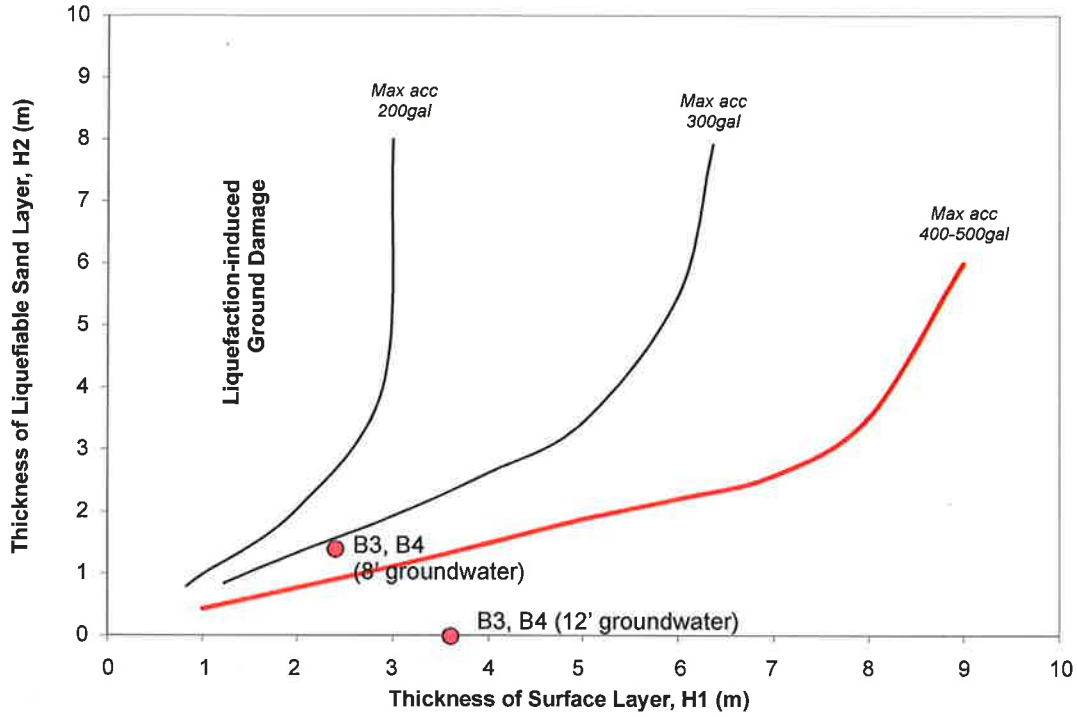


Figure A. Boundary Curve for Discriminating Between Occurrence and Nonoccurrence of Surface Effects of Liquefaction.
Base: Youd & Garris, 1995

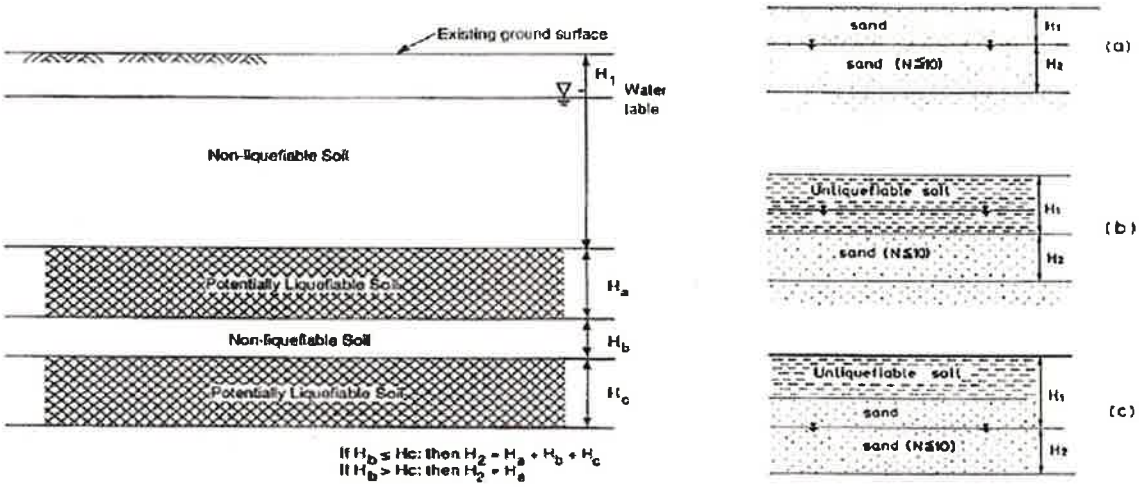


Figure B. Schematic Diagram for Determination of H1 and H2 Used in Figure B (After Ishihara, 1985)
Base: Martin and Lew, 1999

CORNERSTONE EARTH GROUP

Date:	March 16, 2023
Project No.:	1370-2-1
Prepared For:	Mr. William Rocke Garcia **BLACKROCK LLC** 2730 Lone Oak Court Gilroy, California 95020
Re:	Field Infiltration Testing Results Quail Vineyards Watsonville Road and Santa Teresa Boulevard Morgan Hill, California

Dear Mr. Garcia:

As requested, this letter presents infiltration test results and recommendations for the planned stormwater infiltration system for the above referenced project. The location of the site is shown on the Vicinity Map, Figure 1. Our services were performed in accordance with our agreement dated February 27, 2023.

For our use, we were provided a preliminary grading plan packet titled "Quail Vineyards, Morgan Hill, California, Sheet 3, and Sheet 4," prepared by MH Engineering Company, dated November 1, 2022 with markup indicating desired test locations. In addition, we coordinated test locations, depths, and testing method with you based on the provided grading plans.

PROJECT SUMMARY

The project includes redeveloping the approximately 17½-acre site for single-family residential units. Approximately 14 total residential units and an extension of Secretariat Way are planned. At this time, the location of infiltration and detention basins are unknown.

IN-SITU WATER INFILTRATION

To estimate the in-situ infiltration rate of the soils at locations and depths provided and discussed with you, we performed a total of four in-situ field infiltration tests using a Guelph permeameter device (I-1 through I-4) and two in-situ field infiltration tests using a Double-Ring Infiltrometer (D-1 and D-2) on March 8, 2023. The approximate locations of the field infiltration tests (I-1 through I-4, D-1, and D-2) are shown on the attached Site Plan, Figure 2.

Guelph Permeameter Tests

To estimate the infiltration rate of the soils, we performed four in-situ field permeability tests using a Guelph Permeameter by SoilMoisture Equipment Corp., Model #2800, in general accordance with ASTM D5126. Generally, the Guelph permeameter is a constant head device which uses two water-filled chambers to measure infiltration rate in a shallow borehole. A

constant head level is established in the borehole and the rate of water outflow into the surrounding soil is noted. The rate of flow when it reaches a steady state, or constant rate, is used to determine an approximate infiltration rate for that location and depth.

The infiltration tests were performed at an approximate depth of 3 and 5 feet below existing site grades. The test results are summarized in Table 1.

Table 1: In-Situ Field Guelph Permeameter Test Results

Location	Depth Below Existing Grade (ft)	3-D Infiltration Rate		Material at Test Depth
		(in/hr)	(cm/min)	
I-1	3.0	3.45	0.15	Sandy Lean Clay (CL) / Clayey Sand with Gravel (SC)
I-2	3.0	0.18	0.01	Lean Clay with Sand (CL)
I-3	5.0	5.59	0.24	Sandy Lean Clay (CL)
I-4	3.0	0.00	0.00	Lean Clay (CL)

Following completion of the infiltration tests, we hand augered beneath the test depths about ½ to 2 feet beneath the bottom of test to observe the soil conditions beneath the test depth. At I-1, generally sandy lean clays with some fine gravels were encountered to a depth of about 3 feet underlain by clayey sand with gravel to a depth of 3½ feet, the depth of hand auger refusal. At I-2, lean clay with sand was encountered to the maximum depth explored of 5 feet. At I-3, sandy lean clay with some fine gravels was encountered to the maximum depth of 5½ feet. Some roots were also observed within the test hole. At I-4, lean clay was encountered to the maximum depth explored of 5 feet. Boring logs I-1 to I-4 are attached to this letter.

Double-Ring Infiltration Test (DRIT)

We also performed two in-situ field infiltration tests using a double-ring infiltrometer in accordance with ASTM D335 test methods (constant head) at a depth of approximately 3 feet below existing site grades. A mini excavator and hand digging equipment were used to cut approximately 5 x 5 x 3-foot (L x W x H) test pits to perform the infiltration tests. The rings were embedded at least 6 inches below the exposed soil level, filled with approximately 2 to 12 inches of water and allowed to presoak for at least 30 minutes before starting the test readings. Infiltration test D-1 was conducted for approximately 35 minutes while D-2 was conducted for approximately 1 hour and 30 minutes, until a constant infiltration rate was established. The test results are summarized in the following table.

Table 2: Field Test Results

Test Location	Depth Below Existing Grade (ft)	Estimated Stead State Infiltration Rate (in/hr)	Material at Test Depth
D-1	3.0	40.0	Clayey Sand with Gravel (SC)
D-2	3.0	0.0	Lean Clay (CL)

**Note minimal fines were encountered at the D-1 location beneath the test depth. The actual long term infiltration rate may be lower than the test result.*

After infiltration test D-1 was conducted, the test pit was excavated to a depth of 5 feet to observe the soil conditions beneath the test depth. At a depth of about 3¼ feet, clayey gravel

with sand was encountered to the maximum test pit depth of 5 feet. The test pits were loosely backfilled after performing the infiltration tests. Subsurface logs of the two test pits are shown in Figures 3 and 4.

Reliability of Field Test Data

Test results may not be truly indicative of the long-term, in-situ infiltration. Other factors including stratifications, heterogeneous deposits, overburden stress, disturbance, organic content, depth to groundwater, and other factors can influence test results. In addition, for stratified soils such as those encountered at the site, the average horizontal infiltration is typically greater than the average vertical infiltration.

Findings and Recommendations

Based on our findings, the soil at the locations tested and at depths of about 3 and 5 feet below existing grade have infiltration rates of approximately 0 to 40 inches per hour. Based on our test results, the in-situ field tests indicated a variable infiltration rate ranging from impermeable to high infiltration at the depths and locations tested. Based on our observations, the subsurface soils in the upper 5 feet are highly variable.

The project civil engineer should review the above information and provide additional recommendations as deemed necessary.

General Comments and Design Considerations

As discussed, the tests were performed at discrete locations and depths. In addition, some disturbance can occur in preparing the test. Therefore, the above results can vary significantly and may not be representative over the entire site. Localized areas/depths with higher or lower permeable materials can increase or decrease the actual infiltration rates. Therefore, we recommend the potential for variations be considered when evaluating the soil infiltration capacity or performance.

CLOSURE

We hope this provides the information you need at this time. Recommendations presented in this letter have been prepared for the sole use of Blackrock LLC specifically for the Quail Vineyards project at Watsonville Road and Santa Teresa Boulevard in Morgan Hill, California. Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices at this time and location. No warranties are either expressed or implied.

If you have any questions or need any additional information from us, please call and we will be glad to discuss them with you.

CORNERSTONE EARTH GROUP

Sincerely,

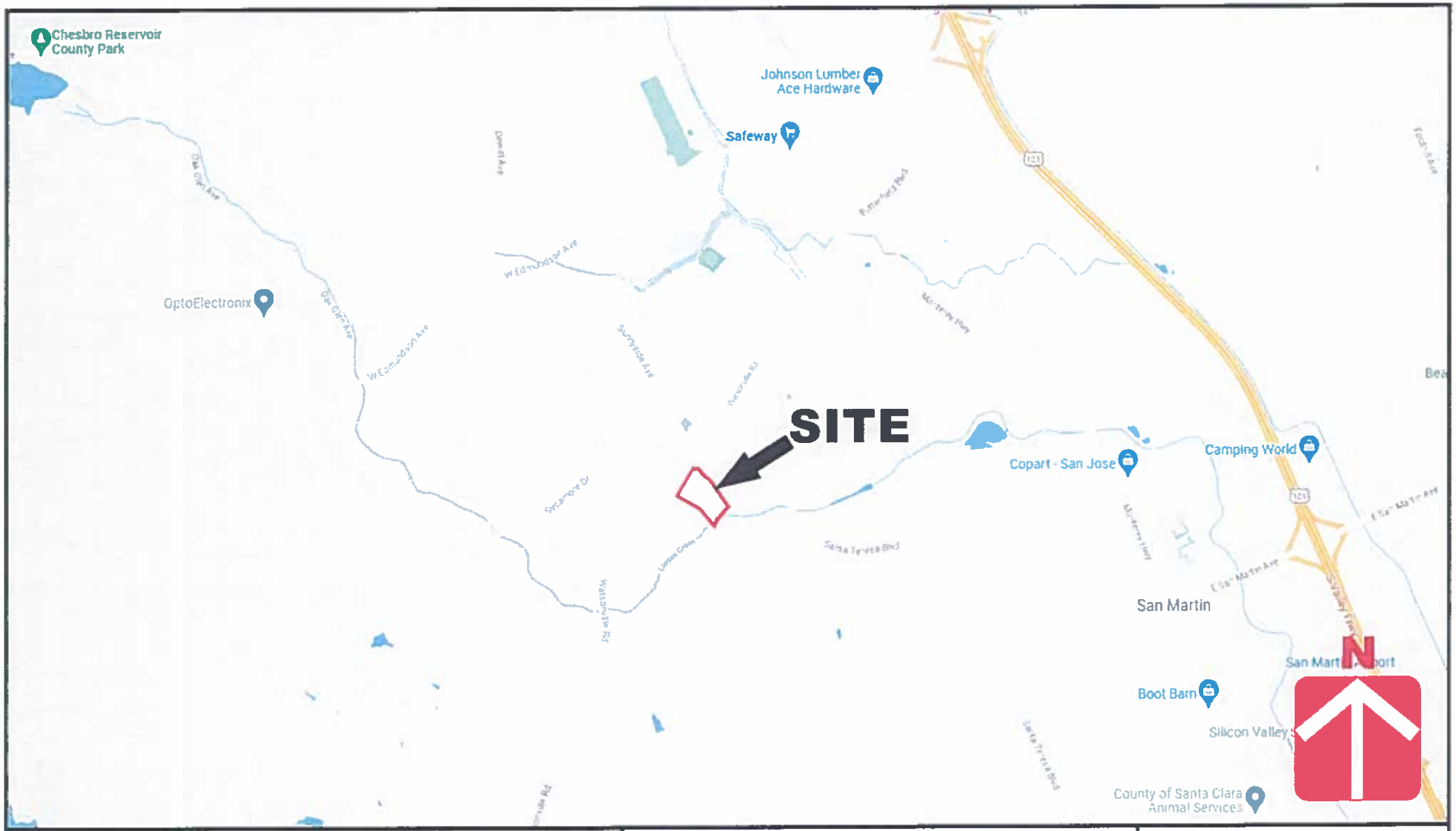
CORNERSTONE EARTH GROUP, INC.

Matthew J Schaffer, P.E., G.E.
Principal Engineer

MJS:ea

Attachments: Figure 1: Vicinity Plan
Figure 2: Site Plan
Figure 3: D-1 Subsurface Log
Figure 4: D-2 Subsurface Log
Boring Logs I-1 and I-4

Copies: Addressee (PDF by email)

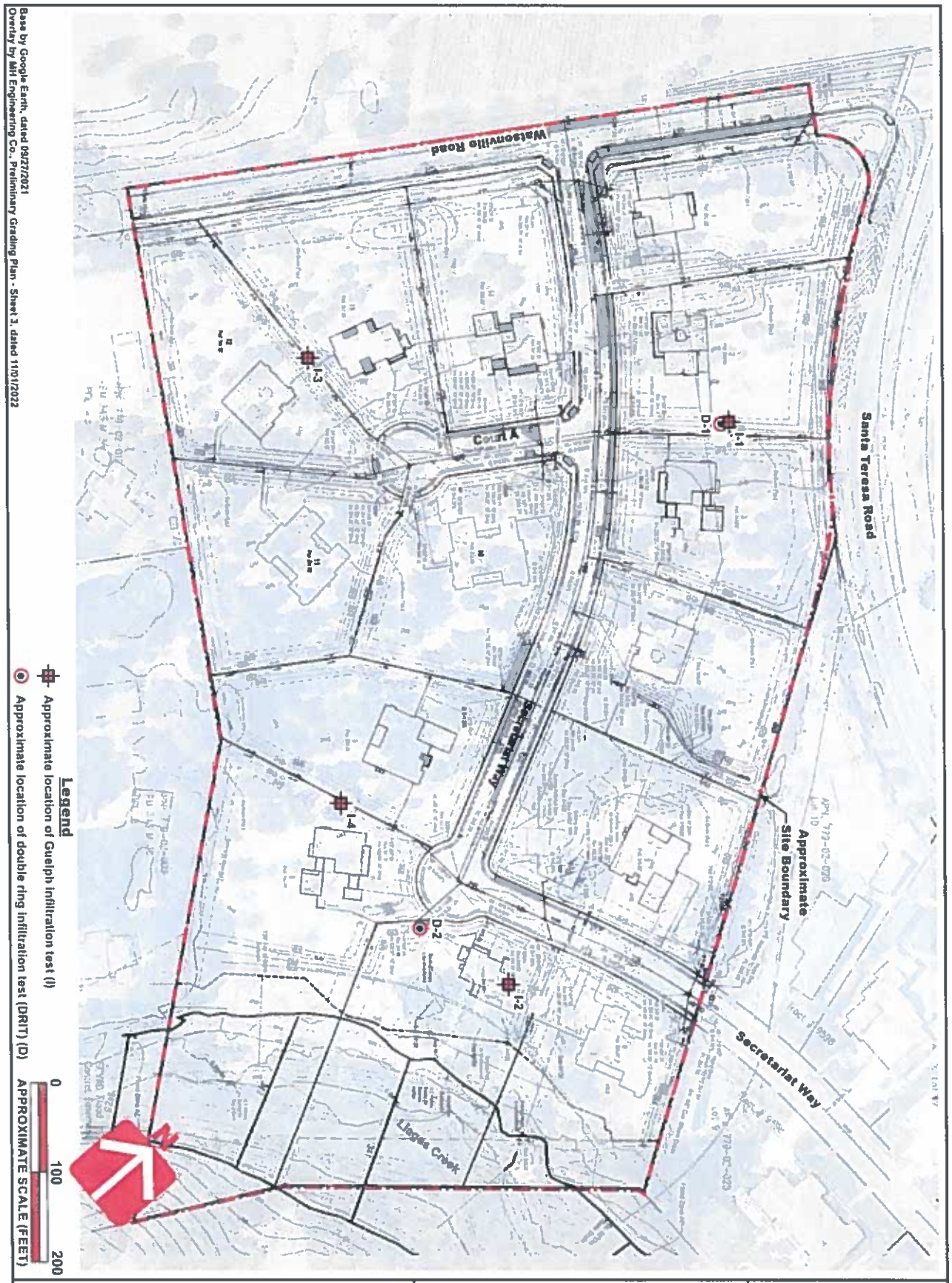


CORNERSTONE EARTH GROUP

Vicinity Map

Quail Vineyards
Morgan Hill, CA

Project Number	1370-2-1
Figure Number	Figure 1
Date	March 2023
Drawn By	RRN

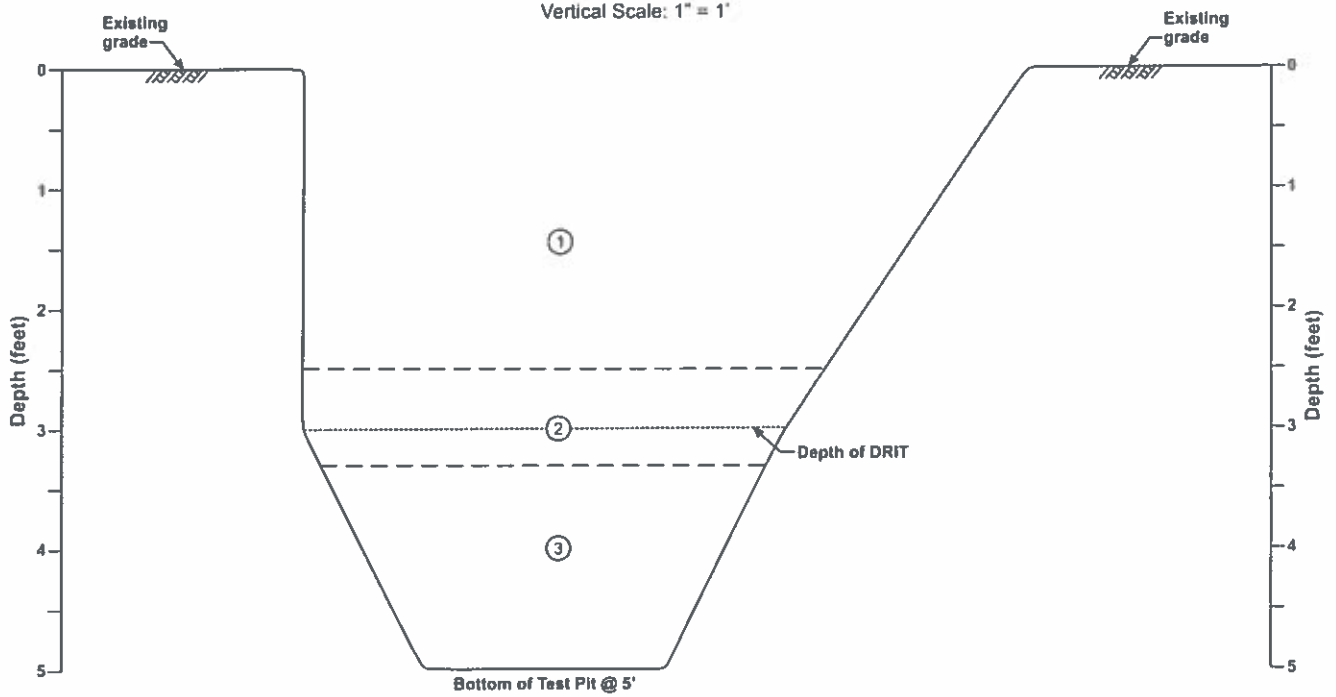


CORNERSTONE EARTH GROUP

Site Plan	Project Number: 1370-2-1
Quail Vineyards Morgan Hill, CA	Figure Number: Figure 2
	Date: March 2023 — Drawn By: RRN

D-1 Subsurface Log

Horizontal Scale: NTS
Vertical Scale: 1" = 1'



UNIT DESCRIPTONS

① **Sandy Lean Clay (CL):**
moist, brown to dark brown mottled, fine to coarse sand, some fine subangular gravel, moderate plasticity

② **Clayey Sand with Gravel (SC):**
moist, dark brown, fine to coarse sand, fine to coarse subrounded gravel

③ **Clayey Gravel with Sand (GC):**
moist, brown, fine to coarse sand, fine to coarse subrounded gravel, some cobbles

Note
DRIT performed at depth of 3 feet prior to continuing subsurface excavation to 5 feet

Project Number	1370-2-1
Figure Number	Figure 3
Date	March 2023
Logged By	JDS
Drawn By	RRN

D-1 Subsurface Log

Quail Vineyards
Morgan Hill, CA

CORNERSTONE EARTH GROUP

D-2 Subsurface Log

Horizontal Scale: NTS
Vertical Scale: 1" = 1'

UNIT DESCRIPTONS

① **Lean Clay (CL):** moist, dark brown to brown, some fine sand, moderate plasticity

CORNERSTONE EARTH GROUP

D-2 Subsurface Log	Project Number 1370-2-1
Quail Vineyards Morgan Hill, CA	Figure Number Figure 4
Date March 2023	Logged By JDS / Drawn By RRN

BORING NUMBER I-1

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA

DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 3.5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. The description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0.0		**Sandy Lean Clay (CL)** moist, brown and dark brown mottled, fine to coarse sand, some fine subangular gravel, moderate plasticity		GB					
	2.5		**Clayey Sand with Gravel (SC)** moist, dark brown to brown, fine to coarse sand, fine to coarse subangular to subrounded gravel Practical refusal of hand auger in gravels or cobbles Bottom of Boring at 3.5 feet.		GB GB					
	5.0									
	7.5									
	10.0									

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/14/23 14:22 - P:\DRAFTING\GINT FILES\1370-2-1 QUAIL VINEYARDS.GPJ

BORING NUMBER I-2

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA
DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0.0		**Lean Clay with Sand (CL)** moist, dark brown to brown, fine to medium sand, moderate plasticity		GB				
	2.5				GB				
	5.0		Bottom of Boring at 5.0 feet.						
	7.5								
	10.0								

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

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BORING NUMBER I-3

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA

DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 5.5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL) 1.0 2.0 3.0 4.0
	0.0		**Sandy Lean Clay (CL)** moist, dark brown to brown, fine to medium sand, moderate plasticity		GB					
	2.5		some fine subangular to subrounded gravel, some roots		GB					
					GB					
					GB					
	5.0				GB					
					GB					
			Bottom of Boring at 5.5 feet.							
	7.5									
	10.0									

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BORING NUMBER I-4

CORNERSTONE EARTH GROUP

PROJECT NAME Quail Vineyards
PROJECT NUMBER 1370-2-1
PROJECT LOCATION Morgan Hill, CA

DATE STARTED 3/2/23 DATE COMPLETED 3/8/23
GROUND ELEVATION _____ BORING DEPTH 5 ft.
DRILLING CONTRACTOR N/A
LATITUDE _____ LONGITUDE _____
DRILLING METHOD Hand Auger
GROUND WATER LEVELS:
LOGGED BY EA
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0.0		**Lean Clay (CL)** moist, dark brown to brown, some fine to medium sand, moderate plasticity		GB					○ HAND PENETROMETER △ TORVANE ● UNCONFINED COMPRESSION ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL 1.0 2.0 3.0 4.0
	2.5				GB					
					GB					
	5.0		Bottom of Boring at 5.0 feet.							
	7.5									
	10.0									

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/14/23 14:22 - P:\DRAFTING\GINT FILES\1370-2-1 QUAIL VINEYARDS.GPJ

MH engineering Co.
16075 Vineyard Blvd., Morgan Hill, CA 95037 - (408) 779-7381

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

Attachment D:
Storm Water Calculations

Drainage Analysis &
Storm Water Management Calculations
for:
Black Rock - 14 Single Family Detached
APN's 779-02-023
Watsonvile Road - Morgan Hill, CA
Job#25268.5 Revised: May 22, 2023

Prepared by:
Arman Nazemi, PE
Lic. No. CE 55927
MH Engineering Company

Page	Description
1	Cover
2	Storm Water Management Synopsis
3	Equivalent Improvement Surface Calculation
7	Rainfall Data
9	HydroCAD Output
181	Outfall structure
185	FEMA evaluation

Spring View - APN 767-11-030

Job#: 98043

Date: 10/11/2020

Revised: 2/16/2023

Project Description:

The project is located in Morgan Hill at southerly quadrant of Santa Teresa Blvd. and Watsonville Road intersection in Residential Planned Development RPD zoning. The project proposes 14 detached residential lots on 683,476 square foot of buildable area. The parcel has frontage along the Llagas Creek with adequate setback designated for flood way. Due to larger footprint of each lot, the site is divided into 30 separate Drainage Management Area, DMAs. Each DMA is provided along the side yards and backyards with a bio-swales with detention facility. Due to lack of infiltration along with lack of a minimum 10 feet separation to high seasonal ground water (water table is found within 8 to 10 feet from the surface per Earth System soil report), the project falls under technical infeasibility. As a result the drainage design is based on providing quality treatment for 10 percent equivalent impervious surface area in compliance with C3 stormwater guidelines. Each lot is proposed to designate bio-swales treatment area for a minimum of 10 percent equivalent impervious surface areas. The site will detain excess surface runoff due to new development within bio-swale areas and after processing quality treatment it will release it at less than or equal to pre-development level in compliance with hydro-modification requirements for all storms up to 100 year event. Furthermore; in order to size the required detention facilities an additional 74,538 sf of hardscape assumption was distributed among all lots proportion to the lot size. This is in addition to proposed hard surfaces depicted on the proposed tentative improvement plans that includes, building site, driveways, sidewalk, road frontage and internal streets improvements. This conservative assumption was to account for future home improvements within their lot which may not require going through permitting requirements. The excess runoff during the peak of the storm will be captured, detained and conveyed through 18 “storm drain pipe that discharges into the existing 60” diameter public storm drain system that flows to the Llagas Creek. This project falls within Central Coast region 3 part of the Monterey Watershed.

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MH engineering Co.
16075 Vineyard Blvd., Morgan Hill, CA 95037 - (408) 779-7381

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

EISA Calculations

Post Construction Storm Water Management Calculations
Per Resolution No. R3-2013-0032

1.) Determination of the Retention Tributary Area

a.)

Impervious Areas									
	Pre-Development			Post-Development					
				Replaced			New		
DMA	Roof	PCC	AC	Roof	PCC	AC	Roof	PCC	AC
1	0	0	0	0	0	0	1,538	9,432	11,829
2	0	0	0	0	0	0	1,739	3,760	0
3	0	0	0	0	0	0	2,788	3,250	0
4	0	0	0	0	0	0	469	4,546	0
5	0	0	0	0	0	0	2,662	3,369	0
6	0	0	0	0	0	0	626	4,120	0
7	0	0	0	0	0	0	1,609	4,098	0
8	0	0	0	0	0	0	2,690	8,534	9,343
9	0	0	0	0	0	0	4,704	5,030	0
10	0	0	0	0	0	0	0	5,203	3,900
11	0	0	0	0	0	0	2,377	3,756	3,928
12	0	0	0	0	0	0	2,767	3,766	0
13	0	0	0	0	0	0	1,823	1,136	0
14	0	0	0	0	0	0	1,308	2,070	0
15	0	0	0	0	0	0	926	5,247	0
16	0	0	0	0	0	0	2,416	2,711	0
17	0	0	0	0	0	0	1,910	2,168	0
18	0	0	0	0	0	0	3,428	5,054	0
19	0	0	0	0	0	0	1,641	8,610	12,356
20	0	0	0	0	0	0	2,991	4,403	0
21	0	0	0	0	0	0	3,523	3,831	0
22	0	0	0	0	0	0	1,621	5,292	0
23	0	0	0	0	0	0	2,748	6,471	0
24	0	0	0	0	0	0	1,551	2,617	0
25	0	0	0	0	0	0	1,334	2,807	0
185	0	0	0	0	0	0	1,719	4,387	0
186	0	0	0	0	0	0	878	4,487	0
187	0	0	0	0	0	0	1,882	10,870	16,407
29	0	0	0	0	0	0	512	2,683	3,850
30	0	0	0	0	0	0	583	3,367	5,082
							56,761	137,077	66,694

Pervious vs Impervious Areas									
		Pre-Development		Post-Development					
					Impervious			i	C
DMA	Total Area	Pervious	Impervious	Pervious	Replaced	New	Total		
1	42,819	42,819	0	20,021	0	22,799	22,799	0.53	0.36
2	21,606	21,606	0	16,107	0	5,499	5,499	0.25	0.20
3	23,914	23,914	0	17,876	0	6,038	6,038	0.25	0.20
4	19,428	19,428	0	14,413	0	5,015	5,015	0.26	0.20
5	21,606	21,606	0	15,575	0	6,031	6,031	0.28	0.21
6	21,301	21,301	0	16,555	0	4,746	4,746	0.22	0.18
7	18,121	18,121	0	12,414	0	5,707	5,707	0.31	0.23
8	43,516	43,516	0	22,950	0	20,567	20,567	0.47	0.32
9	39,030	39,030	0	29,296	0	9,734	9,734	0.25	0.20
10	17,468	17,468	0	8,365	0	9,102	9,102	0.52	0.35
11	17,206	17,206	0	7,145	0	10,061	10,061	0.58	0.40
12	15,333	15,333	0	8,801	0	6,533	6,533	0.43	0.29
13	6,752	6,752	0	3,793	0	2,959	2,959	0.44	0.30
14	11,326	11,326	0	7,948	0	3,377	3,377	0.30	0.22
15	26,528	26,528	0	20,355	0	6,173	6,173	0.23	0.19
16	20,473	20,473	0	15,346	0	5,127	5,127	0.25	0.20
17	16,814	16,814	0	12,736	0	4,078	4,078	0.24	0.19
18	26,571	26,571	0	18,089	0	8,482	8,482	0.32	0.24
19	37,462	37,462	0	14,855	0	22,607	22,607	0.60	0.41
20	21,127	21,127	0	13,733	0	7,394	7,394	0.35	0.25
21	26,310	26,310	0	18,956	0	7,354	7,354	0.28	0.21
22	18,513	18,513	0	11,600	0	6,913	6,913	0.37	0.26
23	23,435	23,435	0	14,216	0	9,219	9,219	0.39	0.28
24	20,473	20,473	0	16,305	0	4,168	4,168	0.20	0.17
25	21,127	21,127	0	16,986	0	4,141	4,141	0.20	0.17
26	22,520	22,520	0	16,415	0	6,105	6,105	0.27	0.21
27	20,952	20,952	0	15,588	0	5,365	5,365	0.26	0.20
28	46,939	46,939	0	17,780	0	29,159	29,159	0.62	0.43
29	11,674	11,674	0	4,629	0	7,045	7,045	0.60	0.41
30	12,866	12,866	0	3,834	0	9,032	9,032	0.70	0.50
Total	693,210	693,210	0	432,678	0	260,531	260,531	0.38	0.27

A_{total} = drainage area (sf)

A_{roofs} = roof areas (sf)

$A_{pcc\text{-}walks/parking}$ = area of pcc walks & parking lot

$A_{pcc\ -streets}$ = area of pcc walks and curbs (sf)

$A_{AC\text{-}streets}$ = Street pavement areas (sf)

$A_{pervious}$ = Planted & Open Areas (sf)

$A_{impervious}$ = total impervious roof areas, PCC areas & AC areas (sf)

i = fraction of the tributary area that is impervious = $A_{impervious} / A_{area}$

$C_{area\#}$ = Area runoff coefficient=C = $0.858i^3 - 0.78i^2 + 0.774i + 0.04$

b.) Correction Factors

Surface Type		Correction Factor
AC		1.00
PCC		1.00
Roofs		1.00
Disturbed Soils/Managed Turf (dependent on original hydrologic soil group)	Soil Group A	0.15
	Soil Group B	0.20
	Soil Group C	0.22
	Soil Group D	0.25
Pervious PCC		0.60
Cobbles		0.60
Pervious AC		0.55
Natural Stone (without grout)		0.25
Turf Block		0.15
Brick (without grout)		0.13
Unit Pavers on Sand		0.10
Crushed Aggregate		0.10
Grass/Other Landscaping		0.10

c) Required Treatment Sizing Calculations

DMA	Total DMA Area (SF)	Impervious Area				EISA (SF)	Required Treatment Area (SF)	Provided Treatment Area (SF)
		Roof (SF)	PCC (SF)	AC (SF)	Landscape (SF)			
		CF: 1.00	CF: 1.00	CF: 1.00	CF: 0.10			
1	42,819	1,538	9,432	11,829	20,021	24,801	2,242	2,385
2	21,606	1,739	3,760	0	16,107	7,110	643	680
3	23,914	2,788	3,250	0	17,876	7,826	711	720
4	19,428	469	4,546	0	14,413	6,456	586	600
5	21,606	2,662	3,369	0	15,575	7,589	681	780
6	21,301	626	4,120	0	16,555	6,402	576	640
7	18,121	1,609	4,098	0	12,414	6,948	631	640
8	43,516	2,690	8,534	9,343	22,950	22,862	2,065	2,210
9	39,030	4,704	5,030	0	29,296	12,663	1,147	1,190
10	17,468	0	5,203	3,900	8,365	9,939	892	1,020
11	17,206	2,377	3,756	3,928	7,145	10,775	973	1,050
12	15,333	2,767	3,766	0	8,801	7,413	666	750
13	6,752	1,823	1,136	0	3,793	3,338	298	360
14	11,326	1,308	2,070	0	7,948	4,172	371	460
15	26,528	926	5,247	0	20,355	8,209	741	800
16	20,473	2,416	2,711	0	15,346	6,662	598	680
17	16,814	1,910	2,168	0	12,736	5,352	475	600
18	26,571	3,428	5,054	0	18,089	10,291	929	1,000
19	37,462	1,641	8,610	12,356	14,855	24,093	2,184	2,250
20	21,127	2,991	4,403	0	13,733	8,767	789	875
21	26,310	3,523	3,831	0	18,956	9,249	840	850
22	18,513	1,621	5,292	0	11,600	8,073	732	750
23	23,435	2,748	6,471	0	14,216	10,641	964	1,000
24	20,473	1,551	2,617	0	16,305	5,799	524	560
25	21,127	1,334	2,807	0	16,986	5,840	526	580
26	22,520	1,719	4,387	0	16,415	7,747	711	640
27	20,952	878	4,487	0	15,588	6,923	636	560
28	46,939	1,882	10,870	16,407	17,780	30,937	2,809	2,850
29	11,674	512	2,683	3,850	4,629	7,508	681	700
30	12,866	583	3,367	5,082	3,834	9,415	847	950
Total	693,210	56,761	137,077	66,694	432,678	303,799	27,467	29,130

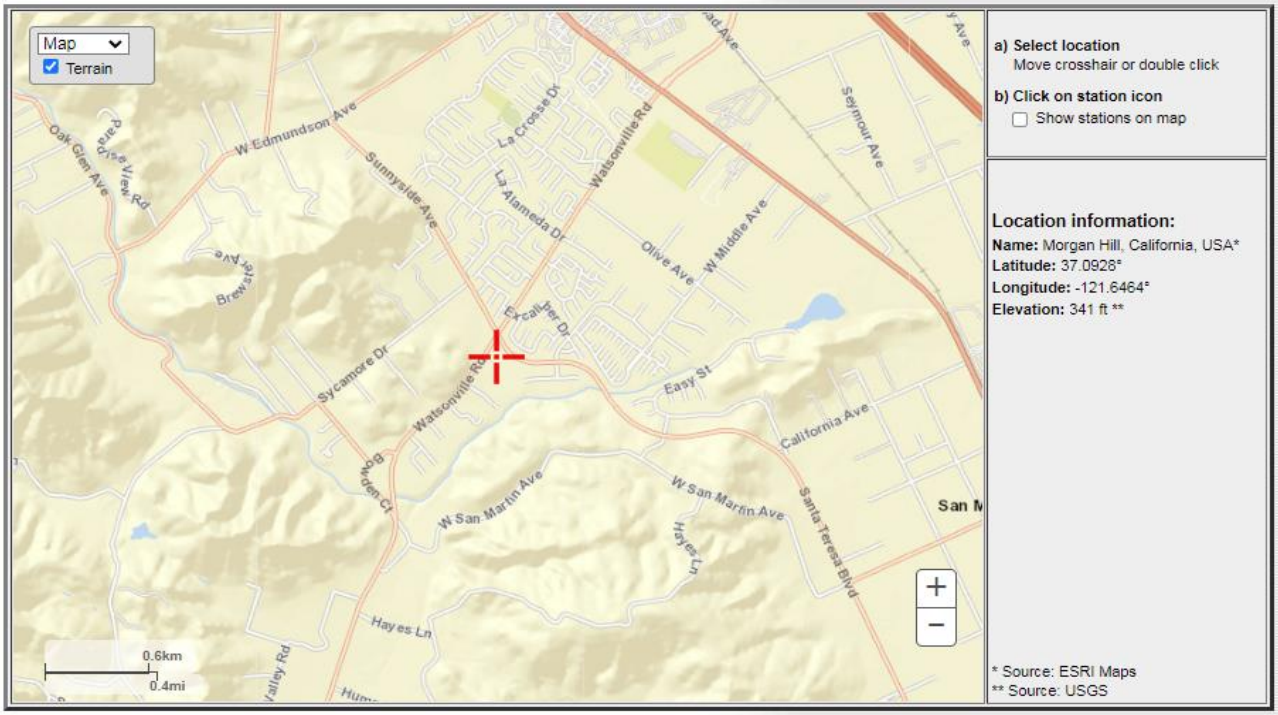
EISA = Equivalent Impervious Surface Area = Sum of Surface Area x Correction Factor
Required Treatment Area = (EISA - Provided Treatment Area) x 0.10

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

Attachment E:
Project Rainfall Data

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

Rainfall Data



POINT PRECIPITATION FREQUENCY (PF) ESTIMATES
WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

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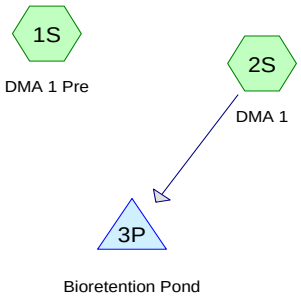
Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

SCS Routing

DMA 1 Event Summary



Events for Subcatchment 1S: Pre Development

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.44
1 year	2.21	0.13	0.053	0.65
2 year	2.90	0.21	0.091	1.12
5 year	3.84	0.33	0.150	1.83
10 year	4.62	0.43	0.203	2.48
25 year	5.72	0.57	0.281	3.43
50 year	6.59	0.68	0.345	4.21
100 year	**7.49**	**0.79**	**0.412**	**5.03**

Events for Subcatchment 2S: DMA 1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.16	0.074	0.90
2 year	2.90	0.29	0.148	1.81
5 year	3.84	0.41	0.219	2.67
10 year	4.62	0.51	0.279	3.41
25 year	5.72	0.64	0.366	4.46
50 year	6.59	0.75	0.435	5.31
100 year	**7.49**	**0.86**	**0.507**	**6.19**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.14	0.08	0.08	**0.00**	336.44	582
2 year	0.27	0.13	0.13	0.00	337.39	1,485
5 year	0.39	0.26	0.26	0.00	339.57	2,323
10 year	0.49	0.39	0.39	0.00	339.96	2,688
25 year	0.63	0.54	0.54	0.00	340.08	2,992
50 year	0.74	0.68	0.68	0.00	340.14	3,122
100 year	**0.85**	**0.80**	**0.80**	0.00	**340.18**	**3,214**

7/3/1900

DMA 1 Pre-Development

Summary for Subcatchment 1S: DMA 1 Pre

Runoff = 0.79 cfs @ 18.14 hrs, Volume= 0.412 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
42,819	79	50-75% Grass cover, Fair, HSG C
42,819		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct**

DMA 1 Post-Development

Summary for Subcatchment 2S: DMA 1

Runoff = 0.86 cfs @ 18.19 hrs, Volume= 0.507 af, Depth= 6.19"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	22,801	98	Roadways
*	20,018	79	Sagebrush range, Poor, HSG B
	42,819	89	Weighted Average
	20,018		46.75% Pervious Area
	22,801		53.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 1 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.983 ac, 53.25% Impervious, Inflow Depth = 5.95" for 100 year event
Inflow = 0.85 cfs @ 18.19 hrs, Volume= 0.488 af
Outflow = 0.80 cfs @ 18.37 hrs, Volume= 0.488 af, Atten= 5%, Lag= 10.7 min
Primary = 0.80 cfs @ 18.37 hrs, Volume= 0.488 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 340.18' @ 18.37 hrs Surf.Area= 2,385 sf Storage= 3,214 cf

Plug-Flow detention time= 131.3 min calculated for 0.488 af (100% of inflow)
Center-of-Mass det. time= 131.2 min (1,066.5 - 935.4)

Volume	Invert	Avail.Storage	Storage Description
#1	335.83'	10,868 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

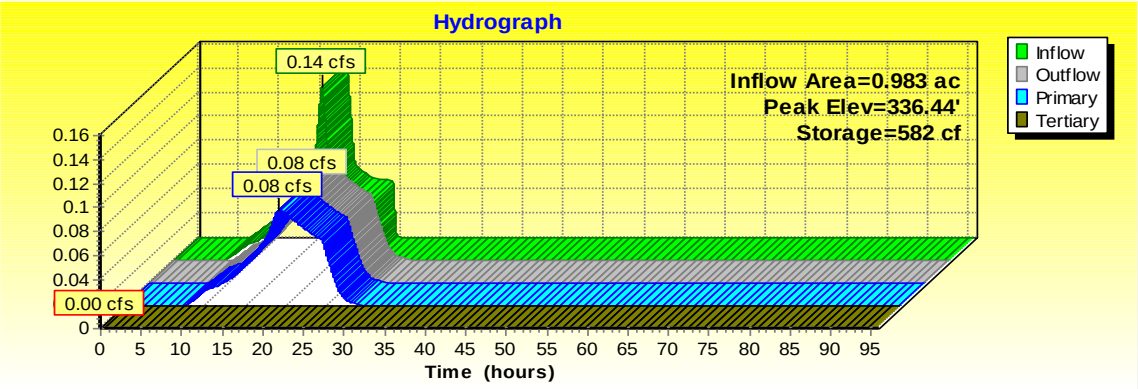
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
335.83	2,385	0.0	0	0
335.84	2,385	40.0	10	10
337.83	2,385	40.0	1,898	1,908
337.84	2,385	10.0	2	1,910
339.83	2,385	10.0	475	2,385
340.33	2,385	100.0	1,193	3,578
340.83	3,216	100.0	1,400	4,978
341.83	4,065	100.0	3,641	8,618
342.33	4,932	100.0	2,249	10,868

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.33'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.33'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	335.83'	**1.0" Vert. Orifice X 4.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	339.80'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	339.20'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#5	Primary	340.05'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.80 cfs @ 18.37 hrs HW=340.18' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.22 cfs @ 9.99 fps)
- **3=Orifice** (Orifice Controls 0.24 cfs @ 2.42 fps)
- **4=Orifice** (Orifice Controls 0.10 cfs @ 4.55 fps)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.96 fps)

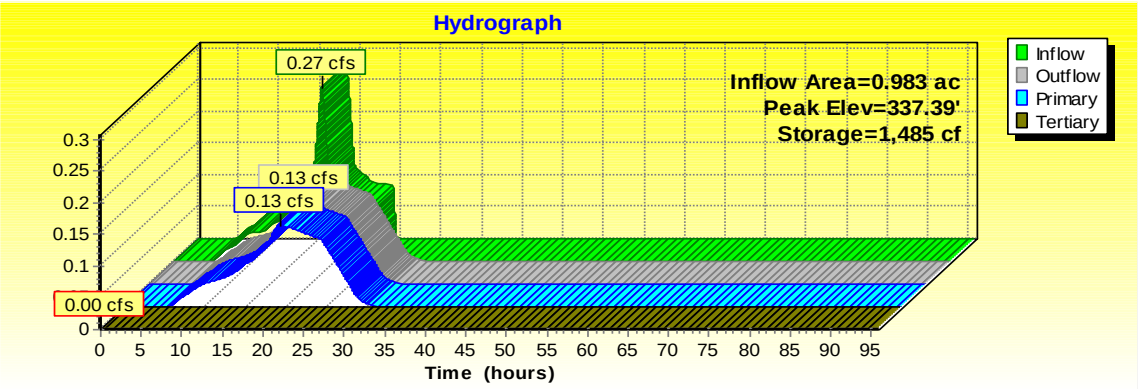
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=335.83' (Free Discharge)

DMA 1 95th% Event



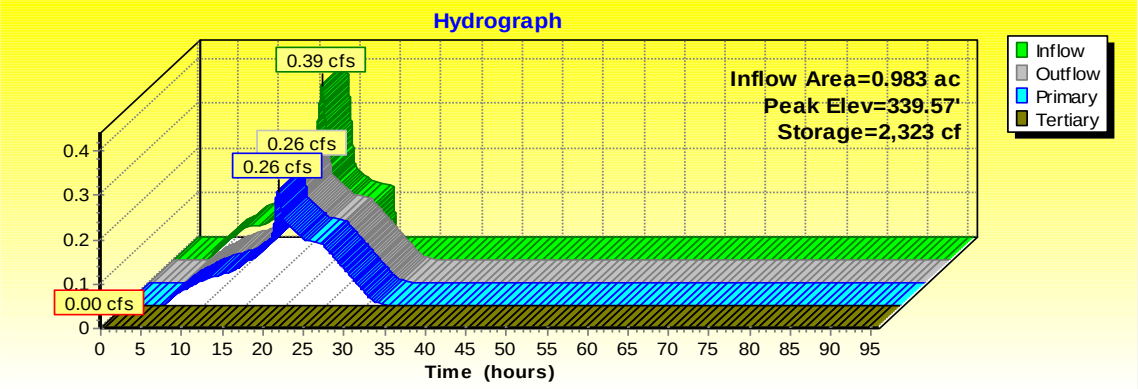
Note: 0 cfs discharge for 95th% event
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via Water Quality Control Outlet
Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 1 2-year Event



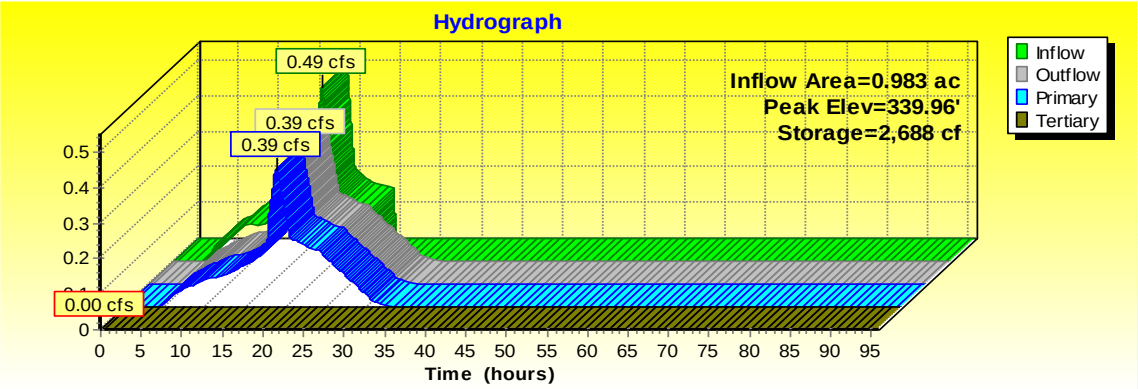
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 5-year Event



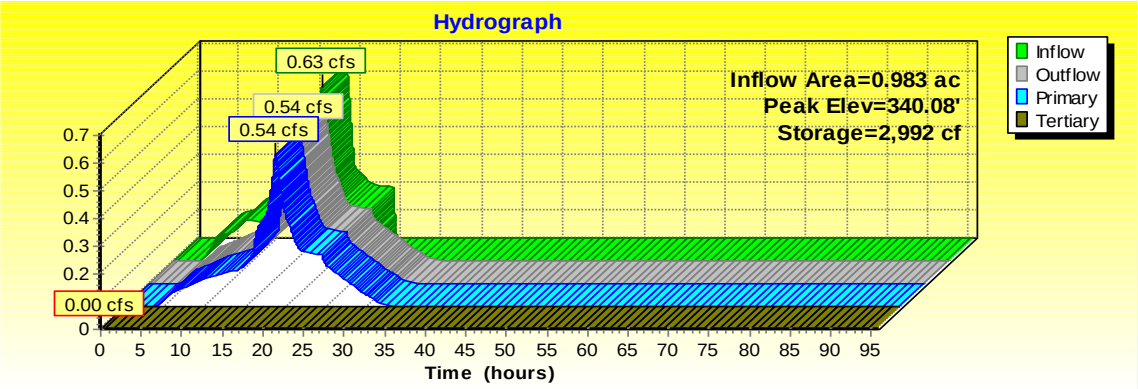
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 10-year Event



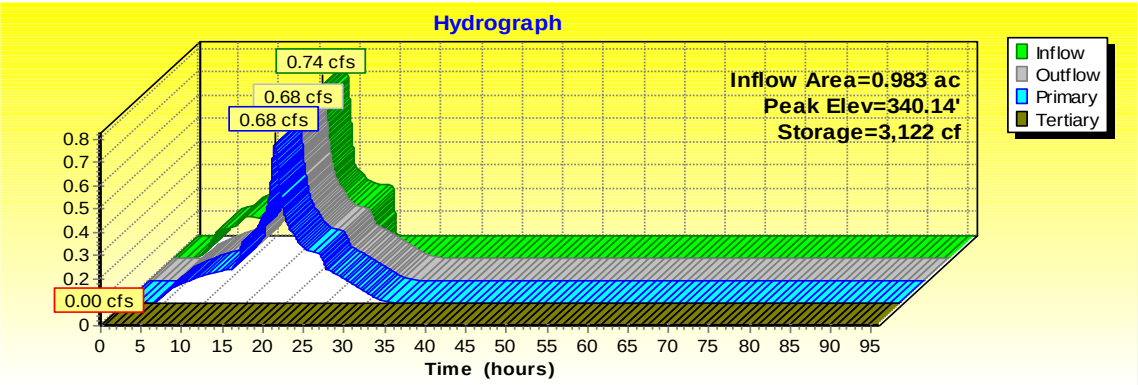
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 25-year Event



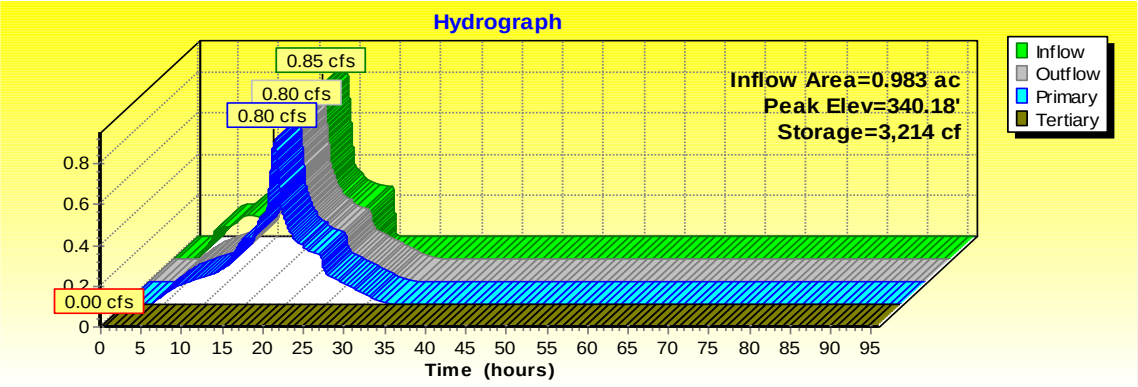
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 50-year Event



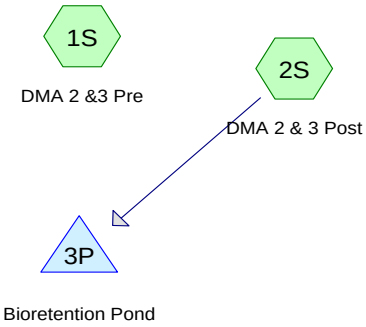
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 100-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 Event Summary



Events for Subcatchment 1S: DMA 2 &3 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.041	0.47
2 year	2.90	0.23	0.102	1.18
5 year	3.84	0.36	0.166	1.91
10 year	4.62	0.46	0.223	2.56
25 year	5.72	0.61	0.307	3.53
50 year	6.59	0.73	0.376	4.32
100 year	**7.49**	**0.86**	**0.448**	**5.15**

Events for Subcatchment 2S: DMA 2 & 3 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.041	0.47
2 year	2.90	0.23	0.102	1.18
5 year	3.84	0.35	0.166	1.91
10 year	4.62	0.46	0.223	2.56
25 year	5.72	0.61	0.307	3.53
50 year	6.59	0.72	0.376	4.32
100 year	**7.49**	**0.84**	**0.448**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.10	0.10	0.10	**0.00**	336.69	94
2 year	0.23	0.21	0.21	0.00	336.85	186
5 year	0.35	0.32	0.32	0.00	337.09	322
10 year	0.46	0.40	0.40	0.00	337.36	469
25 year	0.61	0.51	0.51	0.00	337.81	722
50 year	0.72	0.67	0.67	0.00	338.05	859
100 year	**0.84**	**0.80**	**0.80**	0.00	**338.22**	**952**

DMA 2 & 3 Pre-Development

Summary for Subcatchment 1S: DMA 2 &3 Pre

Runoff = 0.86 cfs @ 18.14 hrs, Volume= 0.448 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
45,520	80	>75% Grass cover, Good, HSG D
45,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 2 & 3 Post-Development

Summary for Subcatchment 2S: DMA 2 & 3 Post

Runoff = 0.84 cfs @ 18.21 hrs, Volume= 0.448 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	11,537	98	Roofs
	33,983	74	>75% Grass cover, Good, HSG C
	45,520	80	Weighted Average
	33,983		74.66% Pervious Area
	11,537		25.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 2 & 3 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.045 ac, 25.34% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.84 cfs @ 18.21 hrs, Volume= 0.448 af
Outflow = 0.80 cfs @ 18.38 hrs, Volume= 0.448 af, Atten= 6%, Lag= 9.9 min
Primary = 0.80 cfs @ 18.38 hrs, Volume= 0.448 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 338.22' @ 18.38 hrs Surf.Area= 1,400 sf Storage= 952 cf

Plug-Flow detention time= 18.0 min calculated for 0.448 af (100% of inflow)
Center-of-Mass det. time= 17.8 min (991.5 - 973.7)

Volume	Invert	Avail.Storage	Storage Description
#1	336.52'	4,464 cf	**DMA 3 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.52'	3,657 cf	**DMA 2 Bio-swale (Prismatic)** Listed below (Recalc)
		8,122 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.52	720	0.0	0	0
336.53	720	40.0	3	3
338.52	720	40.0	573	576
338.53	720	10.0	1	577
340.52	720	10.0	143	720
340.53	720	100.0	7	727
341.02	1,281	100.0	490	1,217
341.52	1,860	100.0	785	2,003
342.02	2,457	100.0	1,079	3,082
342.52	3,072	100.0	1,382	4,464

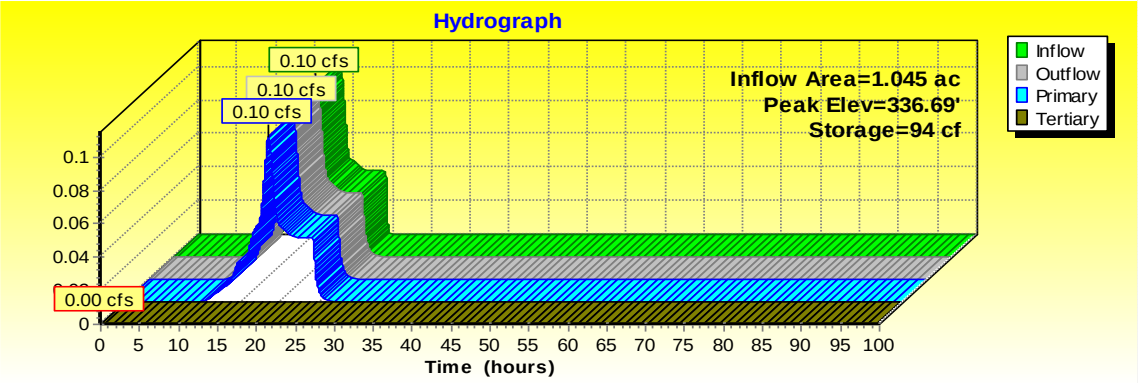
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.52	680	0.0	0	0
336.53	680	40.0	3	3
338.52	680	40.0	541	544
338.53	680	10.0	1	545
340.52	680	10.0	135	680
340.53	680	100.0	7	687
341.02	1,211	100.0	463	1,150
342.02	1,760	100.0	1,486	2,636
342.52	2,327	100.0	1,022	3,657

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.52'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	336.52'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	341.02'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.82'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.80 cfs @ 18.38 hrs HW=338.22' (Free Discharge)
- **1=Orifice** (Orifice Controls 0.59 cfs @ 6.04 fps)
- **2=Grate** (Controls 0.00 cfs)
- **3=Orifice** (Orifice Controls 0.20 cfs @ 2.33 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.52' (Free Discharge)

DMA 2 & 3 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = No flow out at this storm event

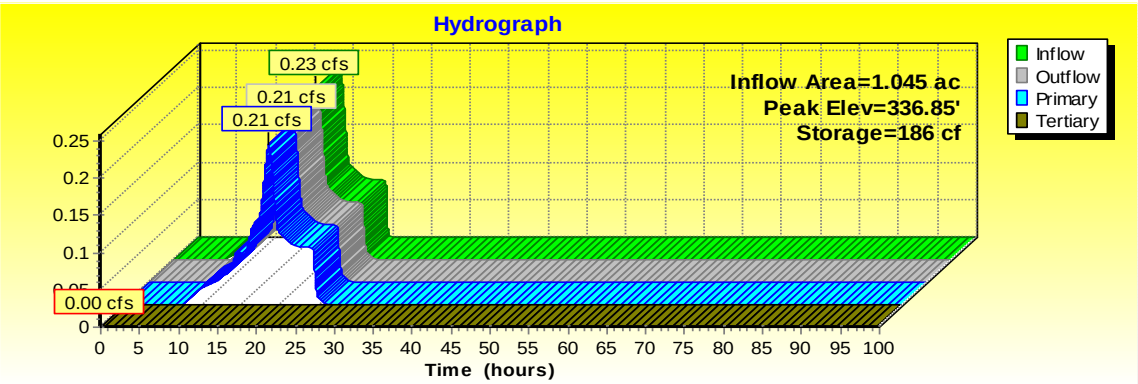
Tertiary = Occurs when water surface elevation exceeds top of bank

Note 1: A full dewatering of subsurface retention occurs in 36 hours after storm

Note 2: Surface pond storage empties in 11 hours after storm < 48 hours ✓ Okay for vector control

Note 3: Since the pond draw down exceeded 88 hours, pond is provided with additional 20% volume

DMA 2 & 3 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

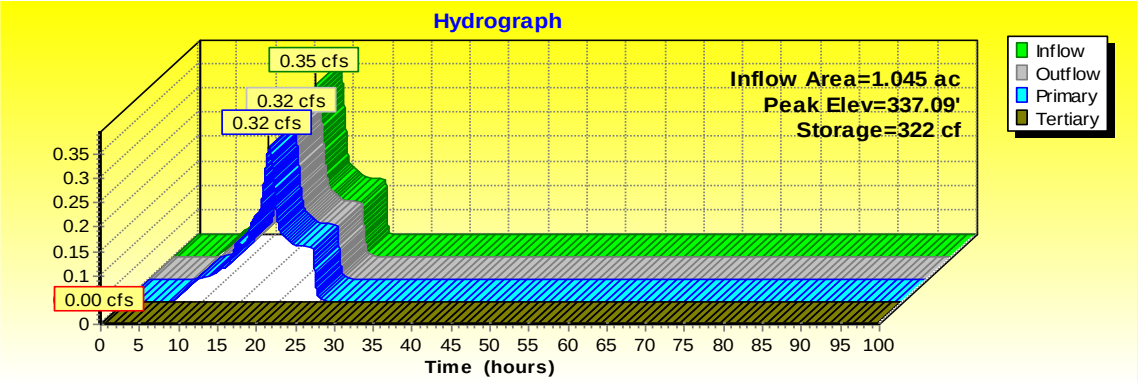
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

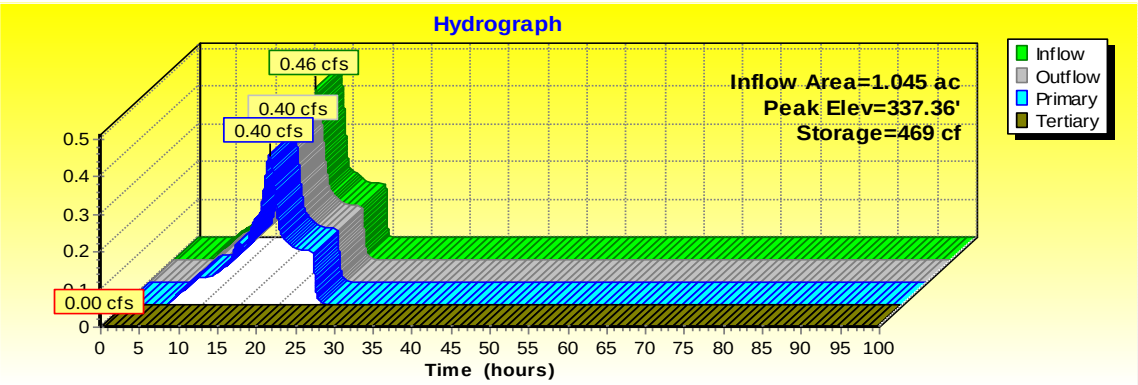
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 &3 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

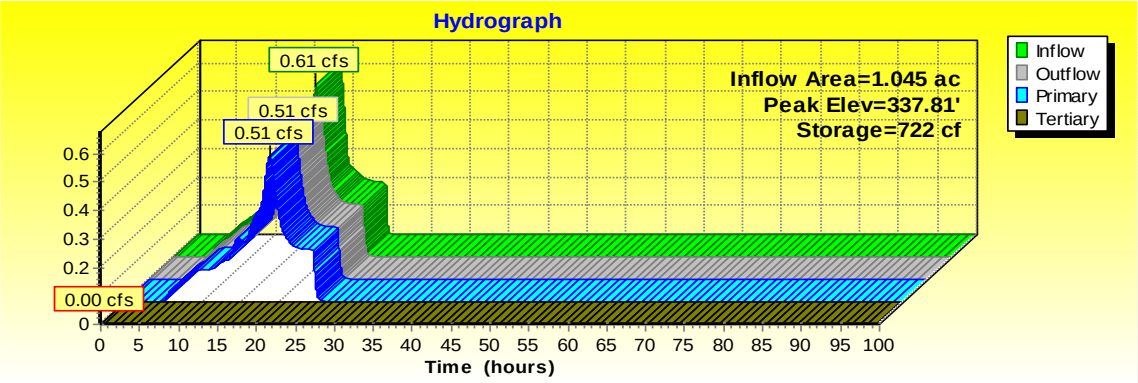
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

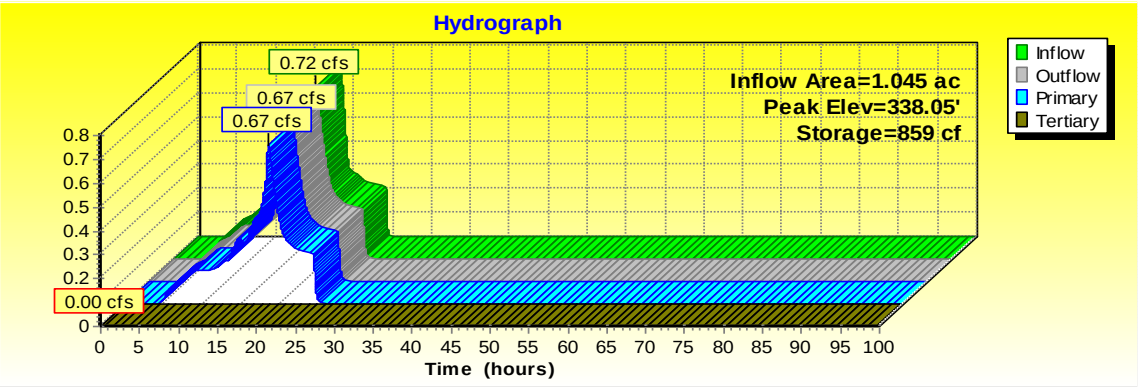
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

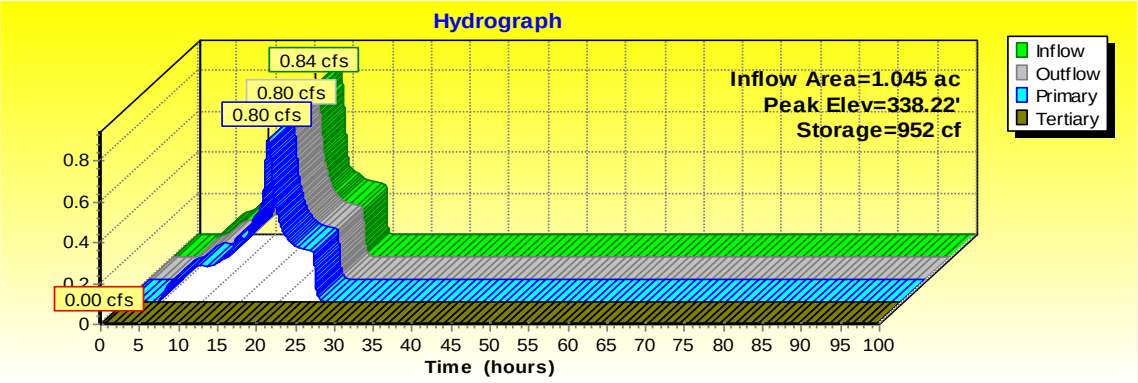
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

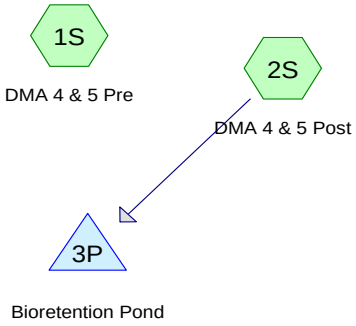
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 Event Summary



Events for Subcatchment 1S: DMA 4 & 5 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.037	0.47
2 year	2.90	0.21	0.092	1.18
5 year	3.84	0.32	0.150	1.91
10 year	4.62	0.42	0.201	2.56
25 year	5.72	0.55	0.277	3.53
50 year	6.59	0.66	0.339	4.32
100 year	**7.49**	**0.77**	**0.404**	**5.15**

Events for Subcatchment 2S: DMA 4 & 5 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.037	0.47
2 year	2.90	0.21	0.092	1.18
5 year	3.84	0.32	0.150	1.91
10 year	4.62	0.41	0.201	2.56
25 year	5.72	0.55	0.277	3.53
50 year	6.59	0.65	0.339	4.32
100 year	**7.49**	**0.76**	**0.404**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	336.90	127
2 year	0.21	0.16	0.16	0.00	337.34	368
5 year	0.32	0.23	0.23	0.00	337.94	700
10 year	0.41	0.28	0.28	0.00	338.56	1,042
25 year	0.55	0.52	0.52	0.00	339.52	1,222
50 year	0.65	0.63	0.63	0.00	340.02	1,290
100 year	**0.76**	**0.76**	**0.76**	0.00	**340.08**	**1,298**

DMA 4 & 5 Pre-Development

Summary for Subcatchment 1S: DMA 4 & 5 Pre

Runoff = 0.77 cfs @ 18.14 hrs, Volume= 0.404 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-125.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
41,034	80	>75% Grass cover, Good, HSG D
41,034		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 4 & 5 Post-Development

Summary for Subcatchment 2S: DMA 4 & 5 Post

Runoff = 0.76 cfs @ 18.21 hrs, Volume= 0.404 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-125.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	11,046	98	Roofs
	29,988	74	>75% Grass cover, Good, HSG C
	41,034	80	Weighted Average
	29,988		73.08% Pervious Area
	11,046		26.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 4 &5 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.942 ac, 26.92% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.76 cfs @ 18.21 hrs, Volume= 0.404 af
Outflow = 0.76 cfs @ 18.22 hrs, Volume= 0.404 af, Atten= 0%, Lag= 0.6 min
Primary = 0.76 cfs @ 18.22 hrs, Volume= 0.404 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-125.00 hrs, dt= 0.01 hrs
Peak Elev= 340.08' @ 18.22 hrs Surf.Area= 1,380 sf Storage= 1,298 cf

Plug-Flow detention time= 46.2 min calculated for 0.404 af (100% of inflow)
Center-of-Mass det. time= 46.0 min (1,019.7 - 973.7)

Volume	Invert	Avail.Storage	Storage Description
#1	336.67'	2,580 cf	**DMA 4 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.67'	3,333 cf	**DMA 5 Bio-swale (Prismatic)** Listed below (Recalc)
		5,913 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.67	600	0.0	0	0
336.68	600	40.0	2	2
338.67	600	40.0	478	480
338.68	600	10.0	1	481
340.67	600	10.0	119	600
340.68	600	100.0	6	606
341.17	1,071	100.0	409	1,015
341.67	1,560	100.0	658	1,673
342.17	2,067	100.0	907	2,580

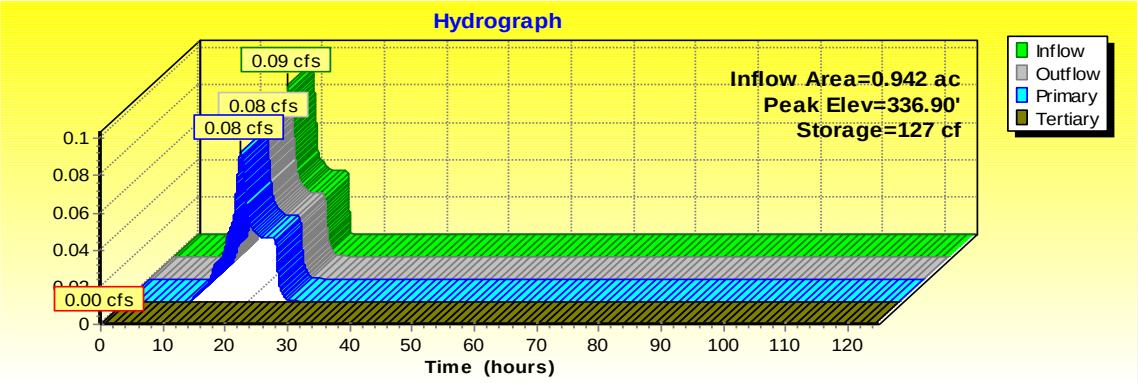
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.67	780	0.0	0	0
336.68	780	40.0	3	3
338.67	780	40.0	621	624
338.68	780	10.0	1	625
340.67	780	10.0	155	780
340.68	780	100.0	8	788
341.17	1,386	100.0	531	1,318
341.67	2,010	100.0	849	2,167
342.17	2,652	100.0	1,166	3,333

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.17'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.17'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.67'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.87'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.76 cfs @ 18.22 hrs HW=340.08' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.38 cfs @ 8.78 fps)
- **3=Orifice** (Orifice Controls 0.25 cfs @ 5.01 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.13 cfs @ 0.82 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.67' (Free Discharge)

DMA 4 & 5 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

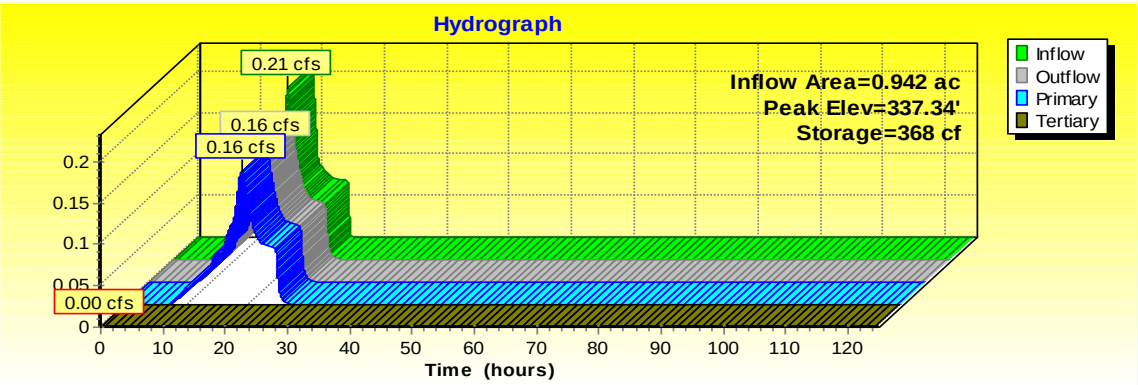
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

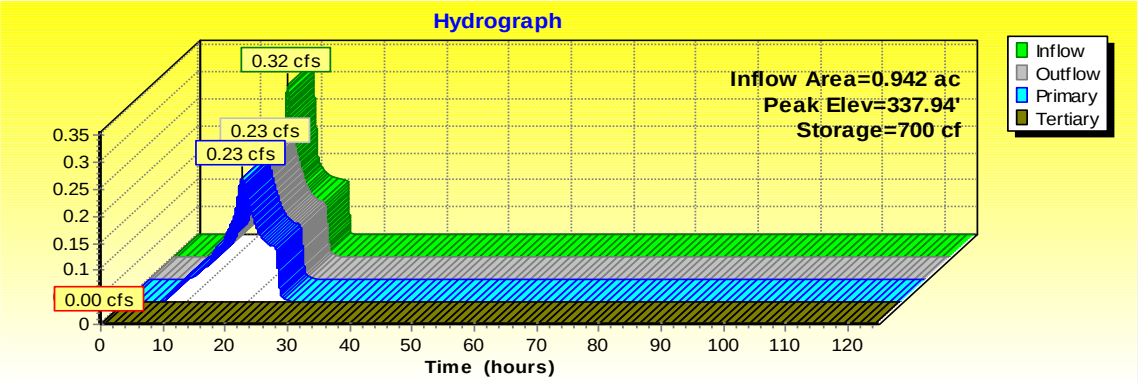
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

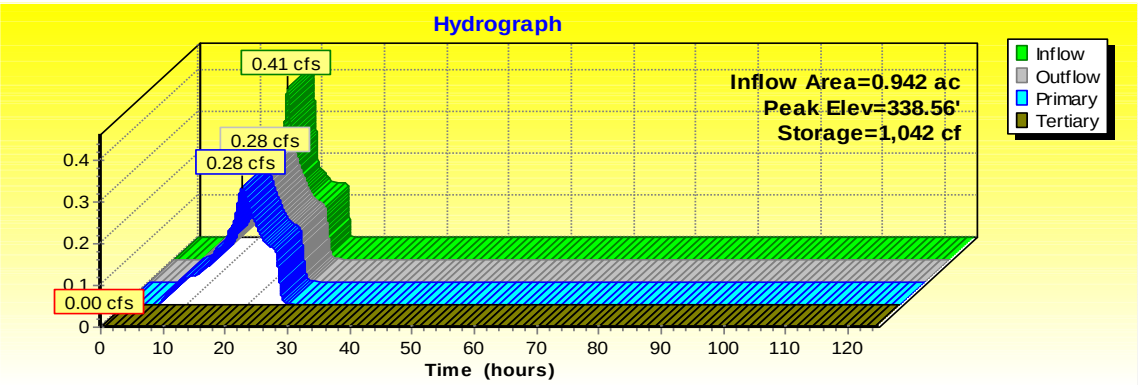
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

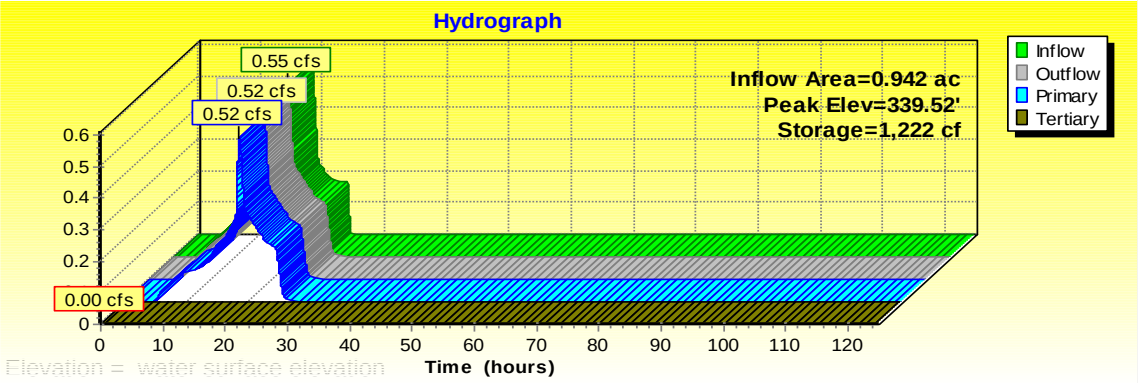
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

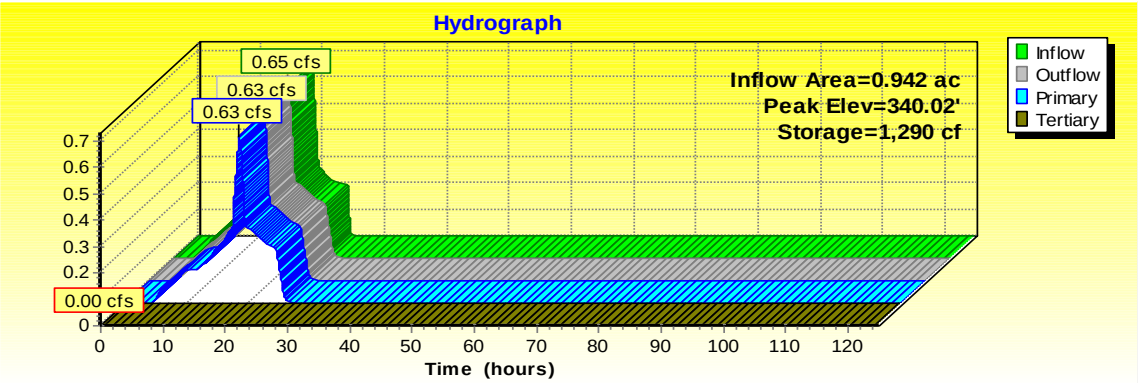
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

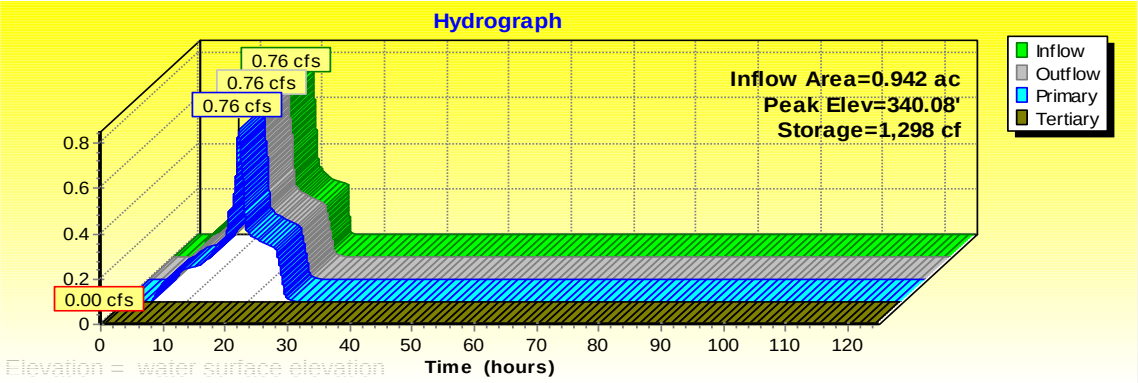
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 100-year Event



Inflow = all inflow into the storm water control

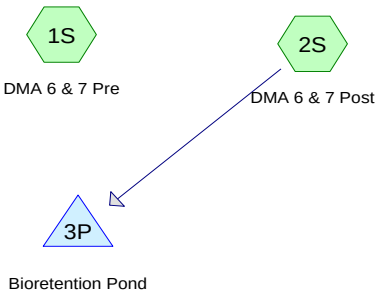
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 6 & 7 Event Summary



Events for Subcatchment 1S: DMA 6 & 7 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.47
2 year	2.90	0.20	0.089	1.18
5 year	3.84	0.30	0.144	1.91
10 year	4.62	0.39	0.193	2.56
25 year	5.72	0.52	0.266	3.53
50 year	6.59	0.61	0.326	4.32
100 year	**7.49**	**0.72**	**0.388**	**5.15**

Events for Subcatchment 2S: DMA 6 & 7 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.47
2 year	2.90	0.20	0.089	1.18
5 year	3.84	0.30	0.144	1.91
10 year	4.62	0.39	0.193	2.56
25 year	5.72	0.52	0.266	3.53
50 year	6.59	0.61	0.326	4.32
100 year	**7.49**	**0.72**	**0.388**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	336.25	78
2 year	0.20	0.19	0.19	0.00	336.38	144
5 year	0.30	0.28	0.28	0.00	336.57	241
10 year	0.39	0.35	0.35	0.00	336.78	347
25 year	0.52	0.49	0.49	0.00	337.01	467
50 year	0.61	0.58	0.58	0.00	337.18	551
100 year	**0.72**	**0.67**	**0.67**	0.00	**337.38**	**653**

DMA 6 & 7 Pre-Development

Summary for Subcatchment 1S: DMA 6 & 7 Pre

Runoff = 0.72 cfs @ 18.27 hrs, Volume= 0.388 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
39,422	80	>75% Grass cover, Good, HSG D
39,422		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 6 & 7 Post-Development

Summary for Subcatchment 2S: DMA 6 & 7 Post

Runoff = 0.72 cfs @ 18.27 hrs, Volume= 0.388 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	10,453	98	Roofs
*	28,969	74	>75% Grass cover, Good, HSG C
	39,422	80	Weighted Average
	28,969		73.48% Pervious Area
	10,453		26.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 6 & 7 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.905 ac, 26.52% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.72 cfs @ 18.27 hrs, Volume= 0.388 af
Outflow = 0.67 cfs @ 18.50 hrs, Volume= 0.388 af, Atten= 7%, Lag= 13.7 min
Primary = 0.67 cfs @ 18.50 hrs, Volume= 0.388 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 337.38' @ 18.50 hrs Surf.Area= 1,280 sf Storage= 653 cf

Plug-Flow detention time= 16.8 min calculated for 0.388 af (100% of inflow)
Center-of-Mass det. time= 14.8 min (993.1 - 978.3)

Volume	Invert	Avail.Storage	Storage Description
#1	336.10'	3,066 cf	**DMA 6 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.10'	2,741 cf	**DMA 7 Bio-swale (Prismatic)** Listed below (Recalc)
		5,807 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.10	640	0.0	0	0
336.11	640	40.0	3	3
338.10	640	40.0	509	512
338.11	640	40.0	3	515
340.10	640	10.0	127	642
340.11	640	10.0	1	643
340.60	640	100.0	314	956
341.10	1,141	100.0	445	1,401
341.60	1,660	100.0	700	2,102
342.10	2,197	100.0	964	3,066

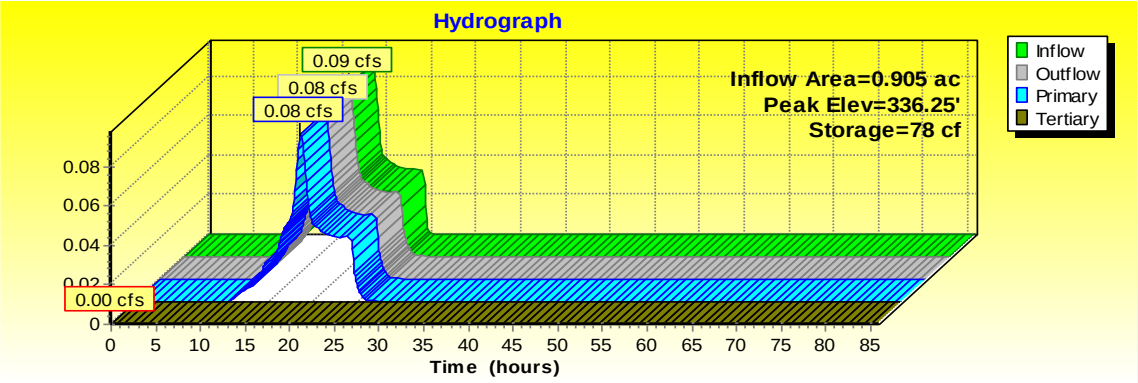
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.10	640	0.0	0	0
336.11	640	40.0	3	3
338.10	640	40.0	509	512
338.11	640	10.0	1	513
340.10	640	10.0	127	640
340.11	640	10.0	1	641
340.60	1,141	100.0	436	1,077
341.10	1,660	100.0	700	1,777
341.60	2,197	100.0	964	2,741

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.10'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.60'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.10'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	336.80'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.67 cfs @ 18.50 hrs HW=337.38' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.51 cfs @ 5.16 fps)
- **3=Orifice** (Orifice Controls 0.16 cfs @ 3.23 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.10' (Free Discharge)

DMA 6 & 7 95th% Event



Note: 0cfs discharge for 95th% event

Elevation = water surface elevation

Inflow = all inflow into the storm water control

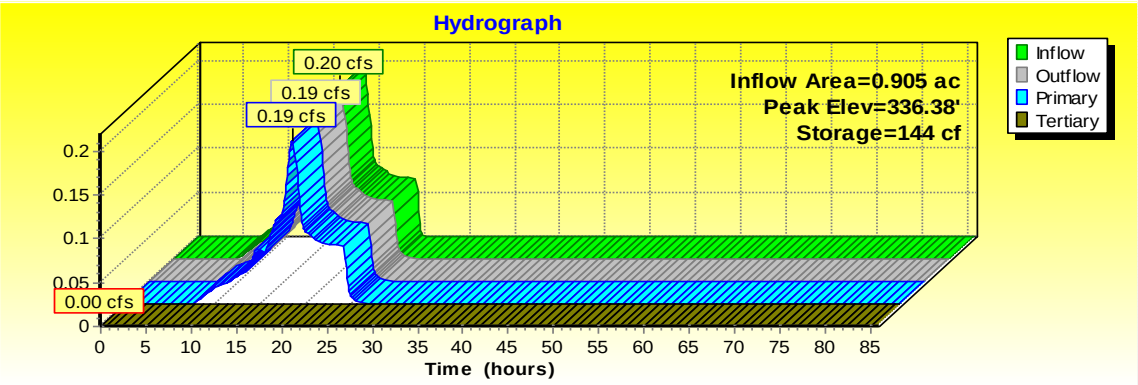
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet (no out flow runoff occurs only infiltrate into the ground)

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

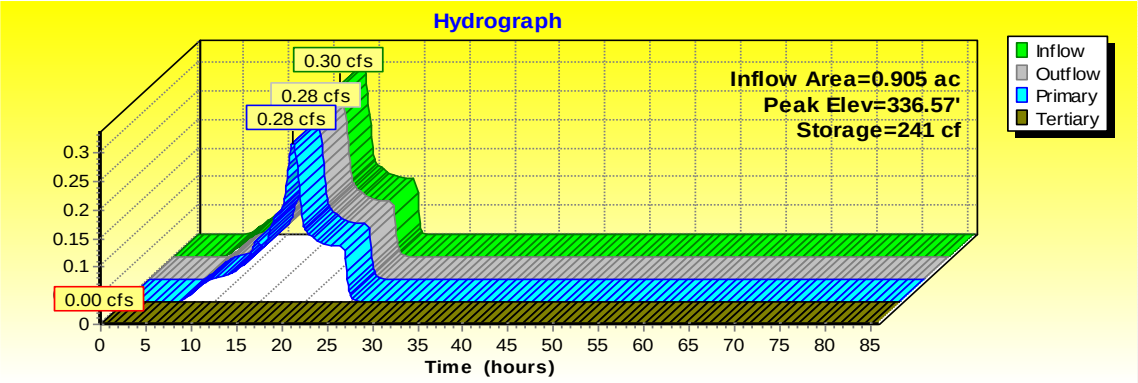
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet (flow runoff but infiltrate into the ground)

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

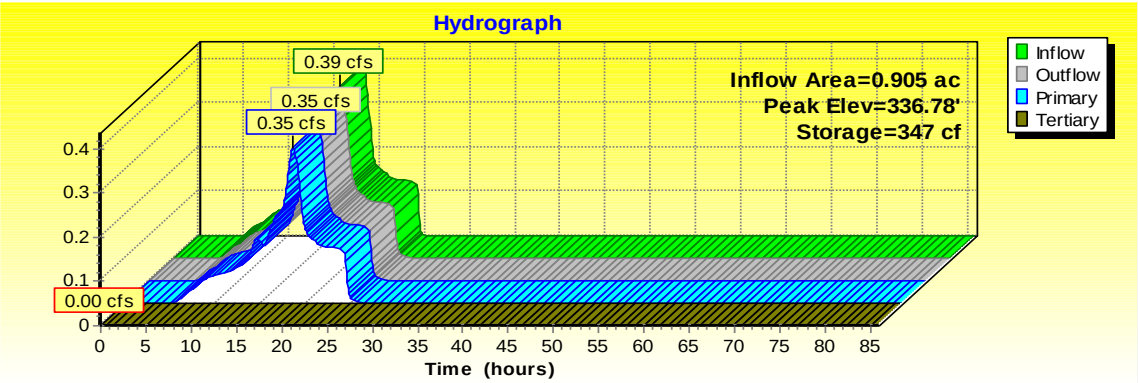
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary =flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

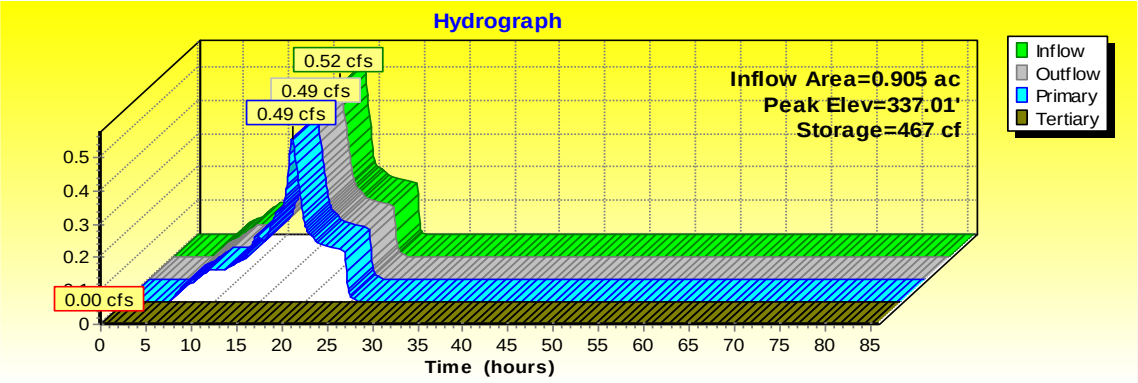
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

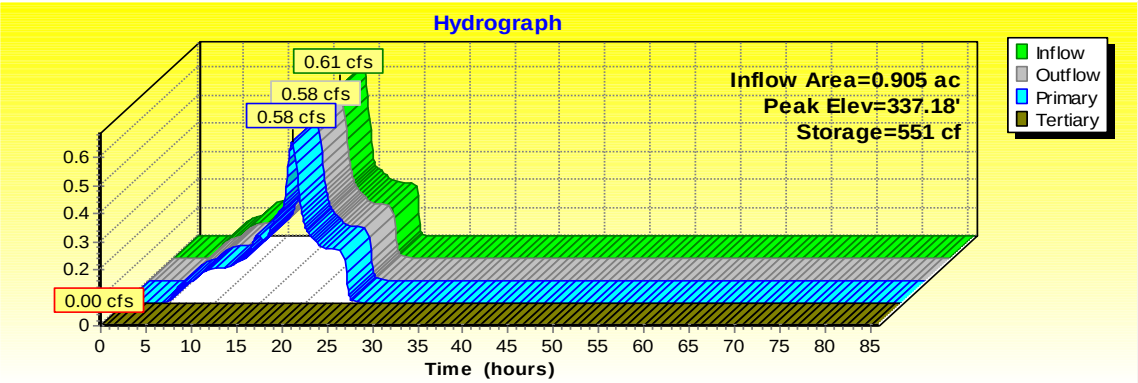
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

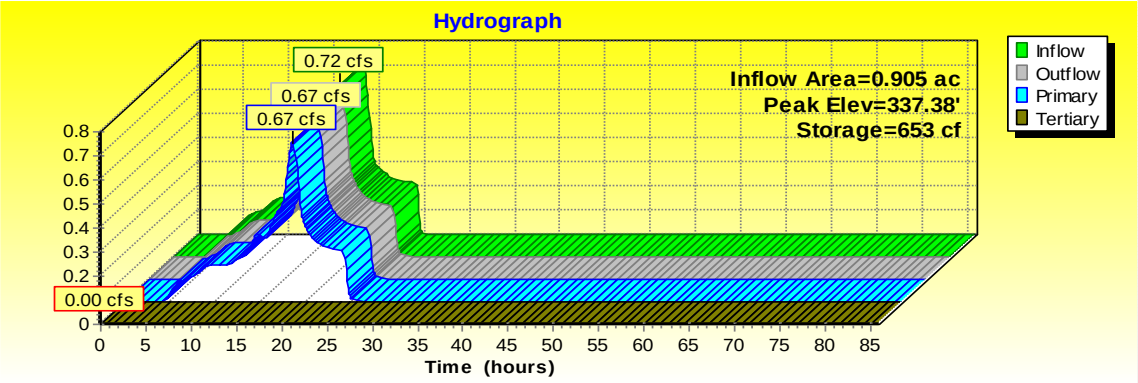
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

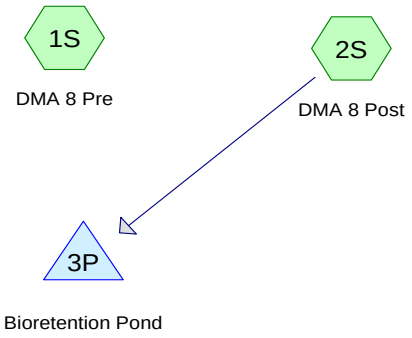
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 Event Summary



Events for Subcatchment 1S: DMA 8 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.44
2 year	2.90	0.21	0.093	1.12
5 year	3.84	0.32	0.153	1.83
10 year	4.62	0.42	0.206	2.48
25 year	5.72	0.56	0.286	3.43
50 year	6.59	0.67	0.351	4.21
100 year	**7.49**	**0.78**	**0.419**	**5.03**

Events for Subcatchment 2S: DMA 8 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.13	0.057	0.69
2 year	2.90	0.26	0.125	1.50
5 year	3.84	0.38	0.193	2.32
10 year	4.62	0.47	0.251	3.02
25 year	5.72	0.61	0.336	4.04
50 year	6.59	0.72	0.405	4.86
100 year	**7.49**	**0.83**	**0.476**	**5.72**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.13	0.07	0.07	**0.00**	336.69	524
2 year	0.26	0.21	0.21	0.00	337.37	1,125
5 year	0.38	0.30	0.30	0.00	337.72	1,434
10 year	0.47	0.36	0.36	0.00	338.05	1,723
25 year	0.61	0.52	0.52	0.00	339.25	2,030
50 year	0.72	0.61	0.61	0.00	340.12	2,247
100 year	**0.83**	**0.69**	**0.69**	0.00	**340.25**	**2,528**

DMA 8 Pre-Development

Summary for Subcatchment 1S: DMA 8 Pre

Runoff = 0.78 cfs @ 18.27 hrs, Volume= 0.419 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
43,516	79	50-75% Grass cover, Fair, HSG C
43,516		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 8 Post-Development

Summary for Subcatchment 2S: DMA 8 Post

Runoff = 0.83 cfs @ 18.27 hrs, Volume= 0.476 af, Depth= 5.72"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	20,566	98	Roofs
*	22,950	74	>75% Grass cover, Good, HSG C
	43,516	85	Weighted Average
	22,950		52.74% Pervious Area
	20,566		47.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 8 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.999 ac, 47.26% Impervious, Inflow Depth = 5.72" for 100 year event
Inflow = 0.83 cfs @ 18.27 hrs, Volume= 0.476 af
Outflow = 0.69 cfs @ 18.67 hrs, Volume= 0.476 af, Atten= 17%, Lag= 24.0 min
Primary = 0.69 cfs @ 18.67 hrs, Volume= 0.476 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.25' @ 18.67 hrs Surf.Area= 2,210 sf Storage= 2,528 cf

Plug-Flow detention time= 84.0 min calculated for 0.476 af (100% of inflow)
Center-of-Mass det. time= 82.7 min (1,034.1 - 951.5)

Volume	Invert	Avail.Storage	Storage Description
#1	336.10'	8,472 cf	**DMA 8 Bio-swale (Prismatic)** Listed below (Recalc)

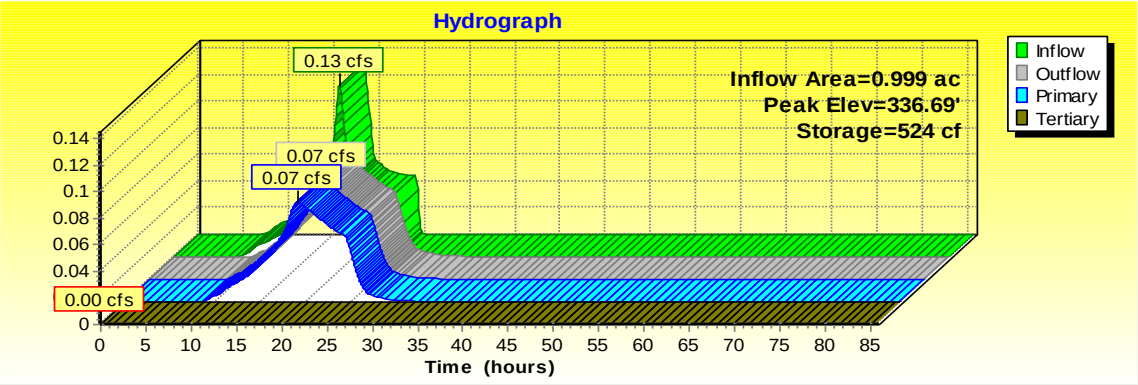
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.10	2,210	0.0	0	0
336.11	2,210	40.0	9	9
338.10	2,210	40.0	1,759	1,768
338.11	2,210	40.0	9	1,777
340.10	2,210	10.0	440	2,217
340.11	2,210	10.0	2	2,219
340.60	2,210	100.0	1,083	3,302
341.10	3,025	100.0	1,309	4,610
341.60	3,857	100.0	1,721	6,331
342.10	4,707	100.0	2,141	8,472

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.10'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.60'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.10'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	336.10'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.20'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.69 cfs @ 18.67 hrs HW=340.25' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.41 cfs @ 8.37 fps)
- **3=Orifice** (Orifice Controls 0.21 cfs @ 9.71 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.65 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.10' (Free Discharge)

DMA 8 95th% Event



Note: 0cfs discharge for 95th% event

Elevation = water surface elevation

Inflow = all inflow into the storm water control

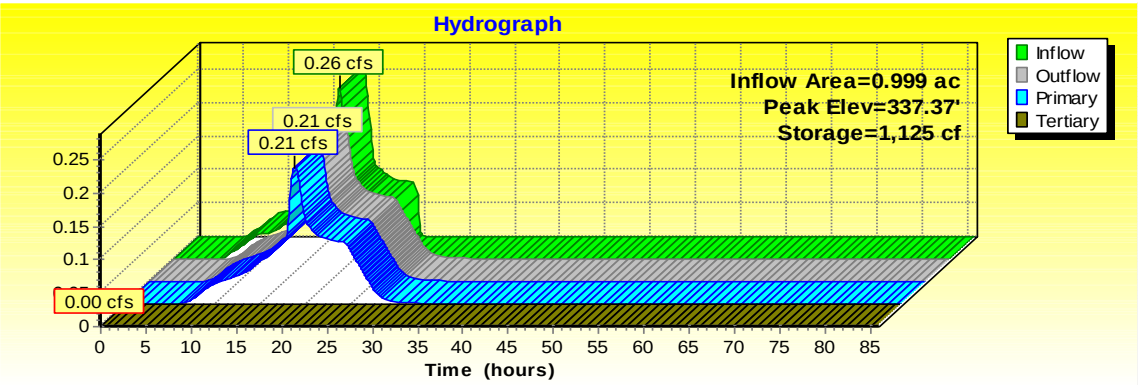
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

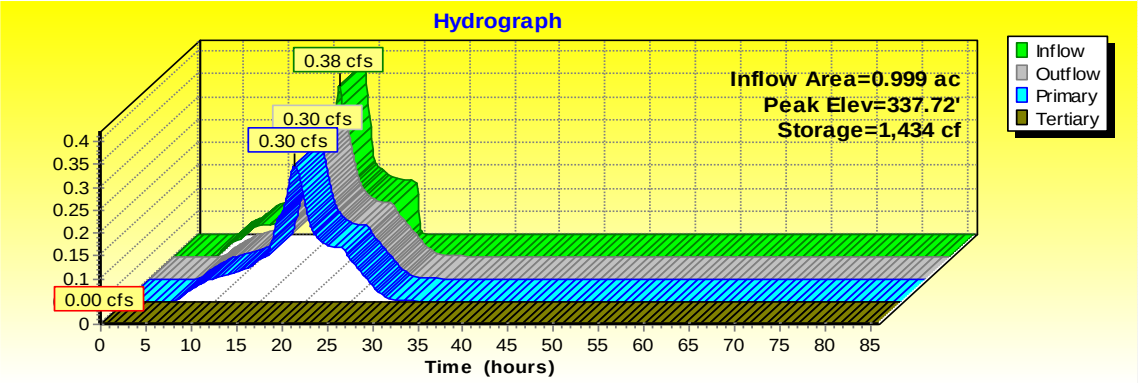
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

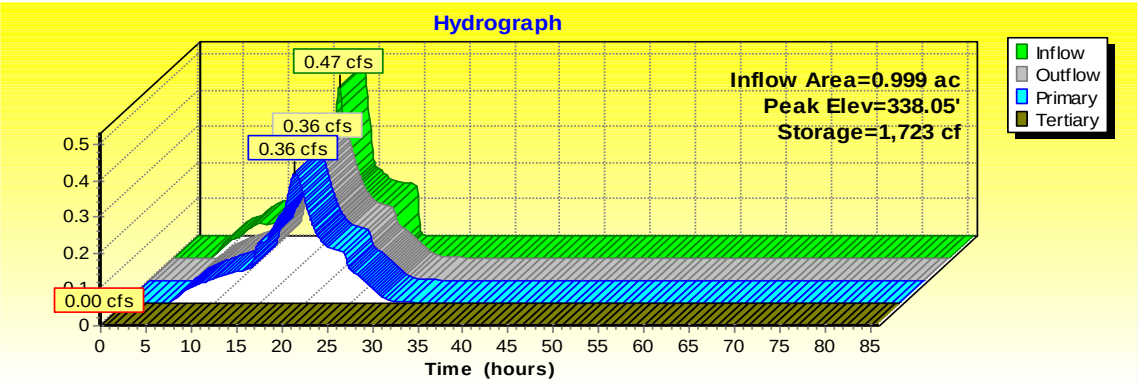
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

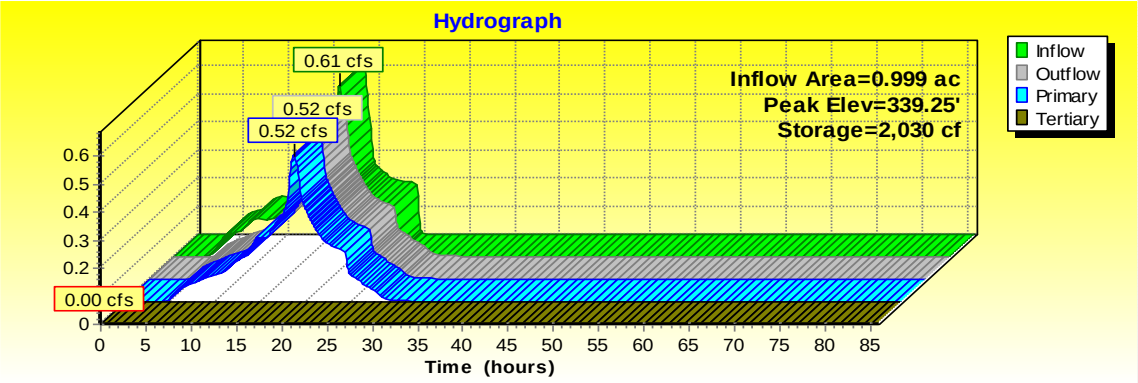
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

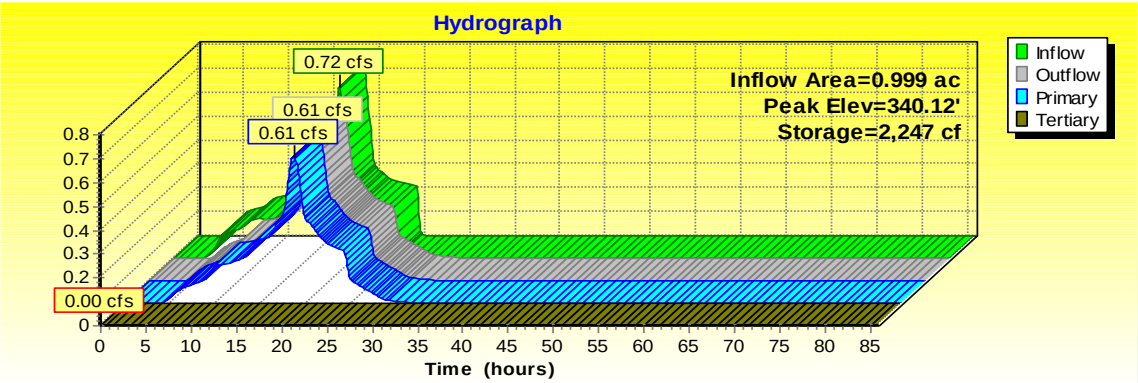
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

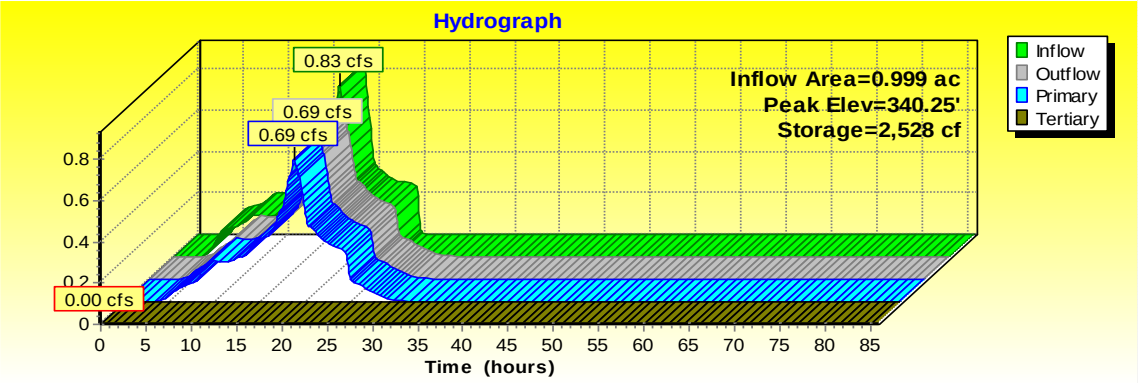
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

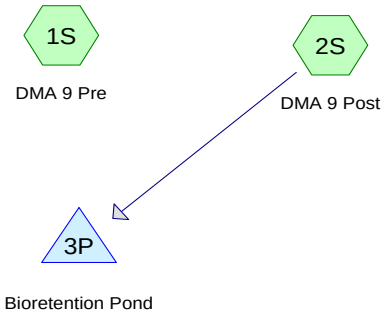
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 Event Summary



Events for Subcatchment 1S: DMA 9 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.08	0.033	0.44
2 year	2.90	0.19	0.083	1.12
5 year	3.84	0.29	0.137	1.83
10 year	4.62	0.38	0.185	2.48
25 year	5.72	0.50	0.256	3.43
50 year	6.59	0.60	0.314	4.21
100 year	**7.49**	**0.70**	**0.376**	**5.03**

Events for Subcatchment 2S: DMA 9 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.035	0.47
2 year	2.90	0.19	0.088	1.18
5 year	3.84	0.30	0.143	1.91
10 year	4.62	0.39	0.191	2.56
25 year	5.72	0.51	0.264	3.53
50 year	6.59	0.61	0.322	4.32
100 year	**7.49**	**0.71**	**0.384**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	337.49	113
2 year	0.19	0.16	0.16	0.00	337.85	285
5 year	0.30	0.28	0.28	0.00	338.18	442
10 year	0.39	0.37	0.37	0.00	338.29	495
25 year	0.51	0.48	0.48	0.00	338.48	585
50 year	0.61	0.57	0.57	0.00	338.67	677
100 year	**0.71**	**0.65**	**0.65**	0.00	**338.90**	**787**

DMA 9 Pre-Development

Summary for Subcatchment 1S: DMA 9 Pre

Runoff = 0.70 cfs @ 18.27 hrs, Volume= 0.376 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
39,030	79	50-75% Grass cover, Fair, HSG C
39,030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 9 Post-Development

Summary for Subcatchment 2S: DMA 9 Post

Runoff = 0.71 cfs @ 18.27 hrs, Volume= 0.384 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,734	98	Roofs
*	29,296	74	>75% Grass cover, Good, HSG C
	39,030	80	Weighted Average
	29,296		75.06% Pervious Area
	9,734		24.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 9 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.896 ac, 24.94% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.71 cfs @ 18.27 hrs, Volume= 0.384 af
Outflow = 0.65 cfs @ 18.52 hrs, Volume= 0.384 af, Atten= 8%, Lag= 14.7 min
Primary = 0.65 cfs @ 18.52 hrs, Volume= 0.384 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 338.90' @ 18.52 hrs Surf.Area= 1,190 sf Storage= 787 cf

Plug-Flow detention time= 25.4 min calculated for 0.384 af (100% of inflow)
Center-of-Mass det. time= 25.6 min (1,003.9 - 978.3)

Volume	Invert	Avail.Storage	Storage Description
#1	337.25'	4,010 cf	**DMA 9 Bioswale (Prismatic)** Listed below (Recalc)

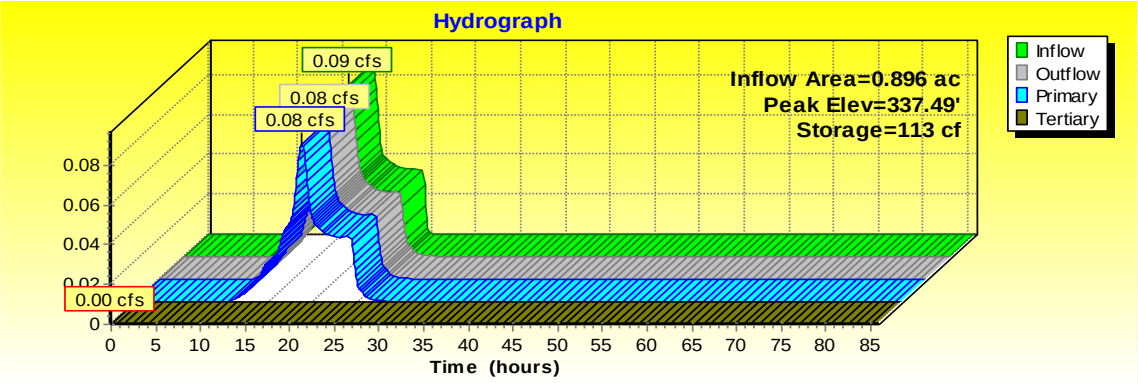
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.25	1,190	0.0	0	0
337.26	1,190	40.0	5	5
339.25	1,190	40.0	947	952
339.26	1,190	40.0	5	957
341.25	1,190	10.0	237	1,194
341.26	1,190	10.0	1	1,195
341.75	1,644	100.0	694	1,889
342.25	2,117	100.0	940	2,829
342.75	2,607	100.0	1,181	4,010

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.75'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.75'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.25'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.00'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.65 cfs @ 18.52 hrs HW=338.90' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.29 cfs @ 5.95 fps)
- **3=Orifice** (Orifice Controls 0.36 cfs @ 4.13 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.25' (Free Discharge)

DMA 9 95th% Event



Note: 0cfs discharge for 95th% event

Elevation = water surface elevation

Inflow = all inflow into the storm water control

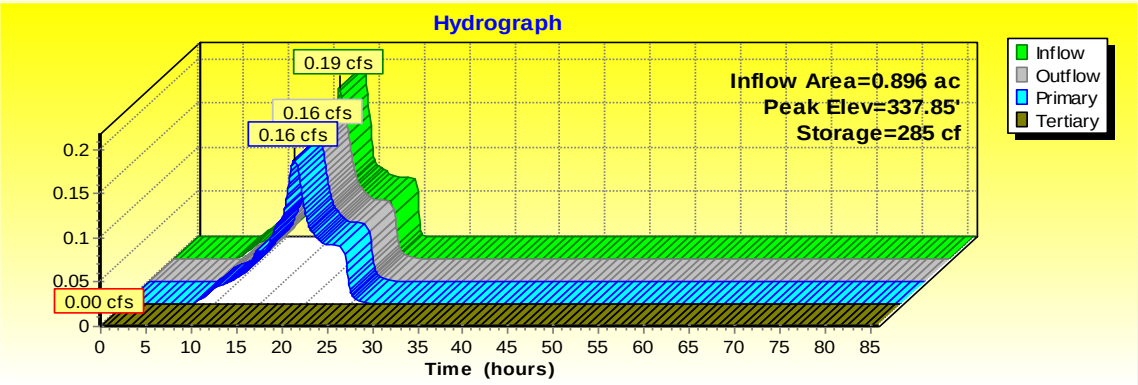
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

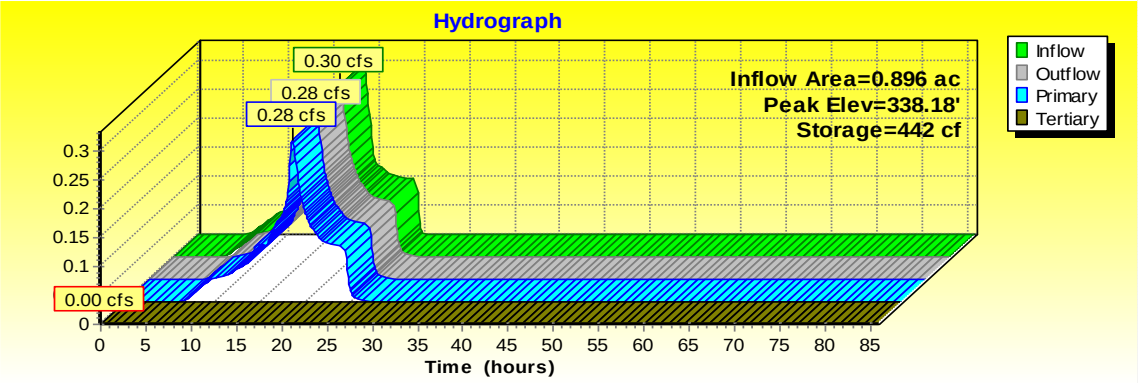
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

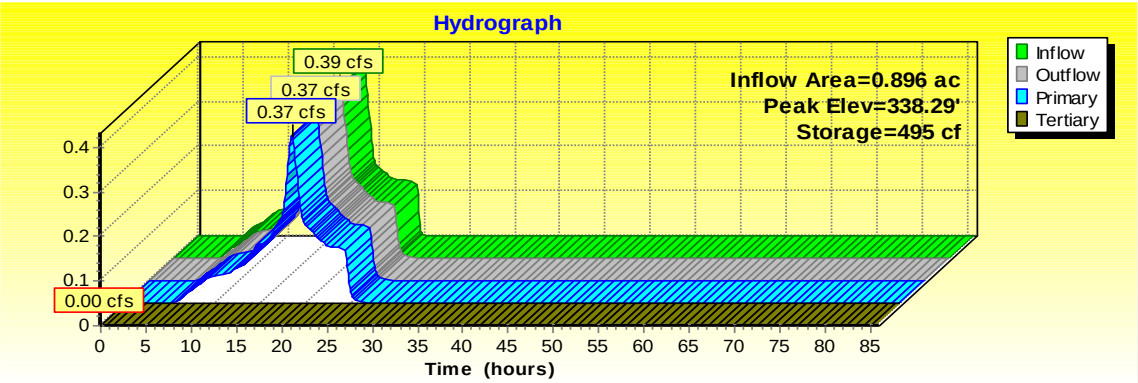
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

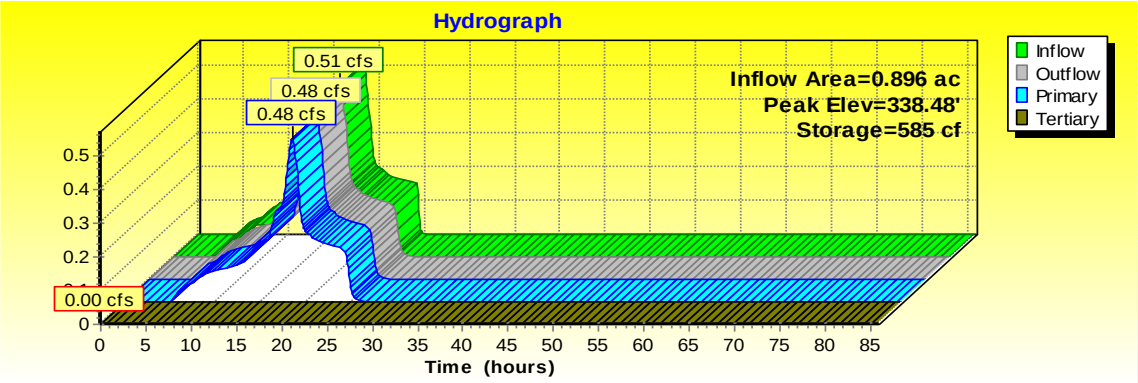
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

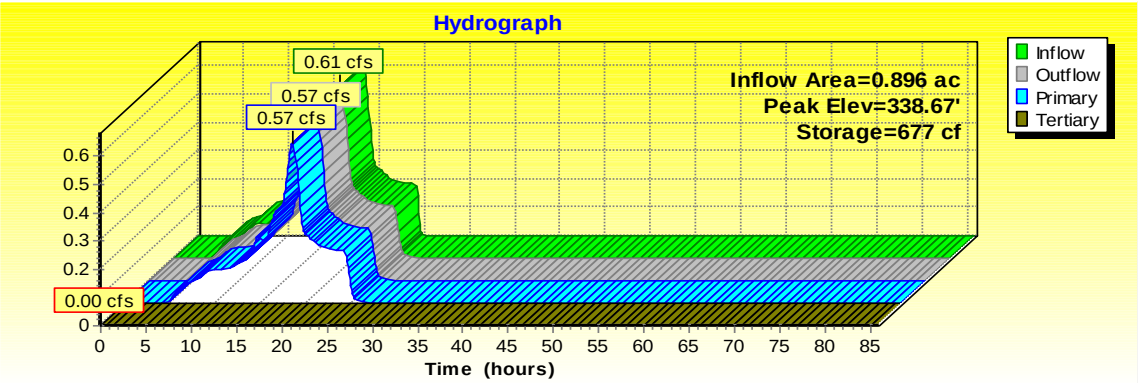
Discarded = flow out via infiltration

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

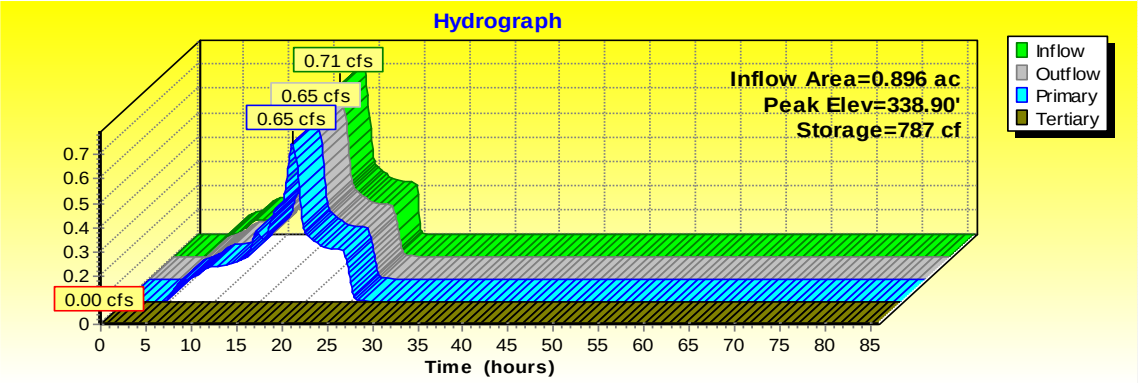
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

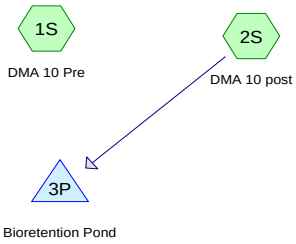
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 Event Summary



Events for Subcatchment 1S: DMA 10 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.015	0.44
2 year	2.90	0.08	0.037	1.12
5 year	3.84	0.13	0.061	1.83
10 year	4.62	0.17	0.083	2.48
25 year	5.72	0.22	0.115	3.43
50 year	6.59	0.27	0.141	4.21
100 year	**7.49**	**0.31**	**0.168**	**5.03**

Events for Subcatchment 2S: DMA 10 post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.06	0.026	0.79
2 year	2.90	0.11	0.055	1.65
5 year	3.84	0.16	0.083	2.49
10 year	4.62	0.20	0.107	3.21
25 year	5.72	0.25	0.142	4.25
50 year	6.59	0.30	0.170	5.08
100 year	**7.49**	**0.34**	**0.199**	**5.95**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.06	0.04	0.04	**0.00**	336.69	134
2 year	0.11	0.07	0.07	0.00	337.21	348
5 year	0.16	0.09	0.09	0.00	337.84	602
10 year	0.20	0.15	0.15	0.00	338.19	747
25 year	0.25	0.22	0.22	0.00	338.89	873
50 year	0.30	0.27	0.27	0.00	339.48	934
100 year	**0.34**	**0.30**	**0.30**	0.00	**340.11**	**997**

DMA 10 Pre-Development

Summary for Subcatchment 1S: DMA 10 Pre

Runoff = 0.31 cfs @ 18.27 hrs, Volume= 0.168 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
17,468	79	50-75% Grass cover, Fair, HSG C
17,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 10 Post-Development

Summary for Subcatchment 2S: DMA 10 post

Runoff = 0.34 cfs @ 18.27 hrs, Volume= 0.199 af, Depth= 5.95"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,102	98	Roofs
*	8,366	74	>75% Grass cover, Good, HSG C
	17,468	87	Weighted Average
	8,366		47.89% Pervious Area
	9,102		52.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.401 ac, 52.11% Impervious, Inflow Depth = 5.95" for 100 year event
Inflow = 0.34 cfs @ 18.27 hrs, Volume= 0.199 af
Outflow = 0.30 cfs @ 18.55 hrs, Volume= 0.199 af, Atten= 11%, Lag= 17.2 min
Primary = 0.30 cfs @ 18.55 hrs, Volume= 0.199 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.11' @ 18.55 hrs Surf.Area= 1,020 sf Storage= 997 cf

Plug-Flow detention time= 79.7 min calculated for 0.199 af (100% of inflow)
Center-of-Mass det. time= 80.0 min (1,020.0 - 940.0)

Volume	Invert	Avail.Storage	Storage Description
#1	336.36'	4,692 cf	**DMA 10 Bio-swale (Prismatic)** Listed below (Recalc)

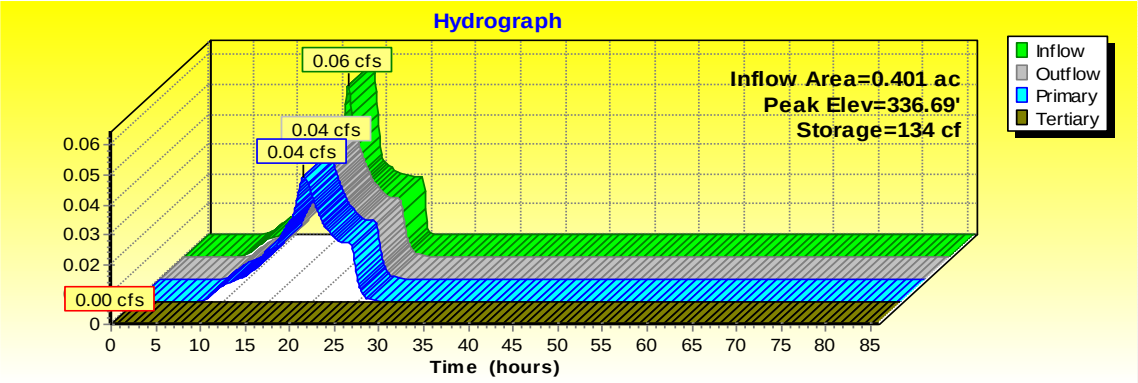
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.36	1,020	0.0	0	0
336.37	1,020	40.0	4	4
338.36	1,020	40.0	812	816
338.37	1,020	40.0	4	820
340.36	1,020	10.0	203	1,023
340.37	1,020	10.0	1	1,024
340.86	1,414	100.0	596	1,620
341.36	1,827	100.0	810	2,431
341.86	2,257	100.0	1,021	3,452
342.36	2,706	100.0	1,241	4,692

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.36'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.86'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.36'	**1.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.90'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.20'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.30 cfs @ 18.55 hrs HW=340.10' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.15 cfs @ 9.26 fps)
- **3=Orifice** (Orifice Controls 0.15 cfs @ 7.00 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.36' (Free Discharge)

DMA 10 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

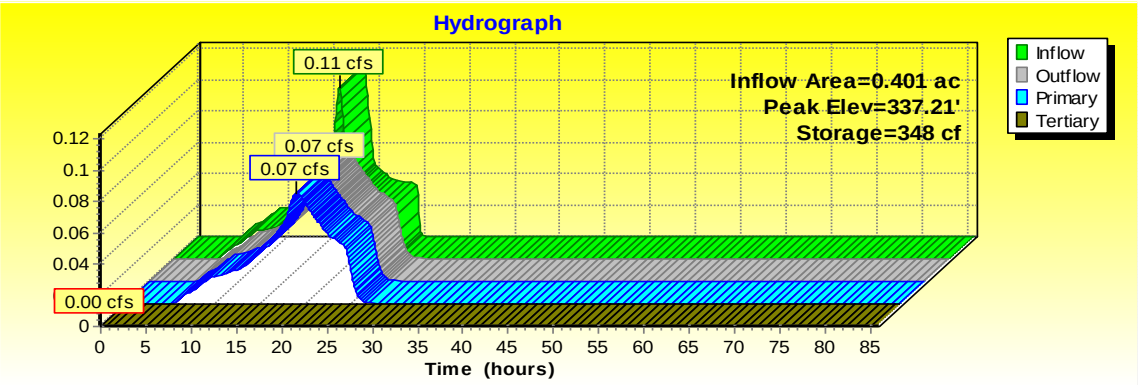
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

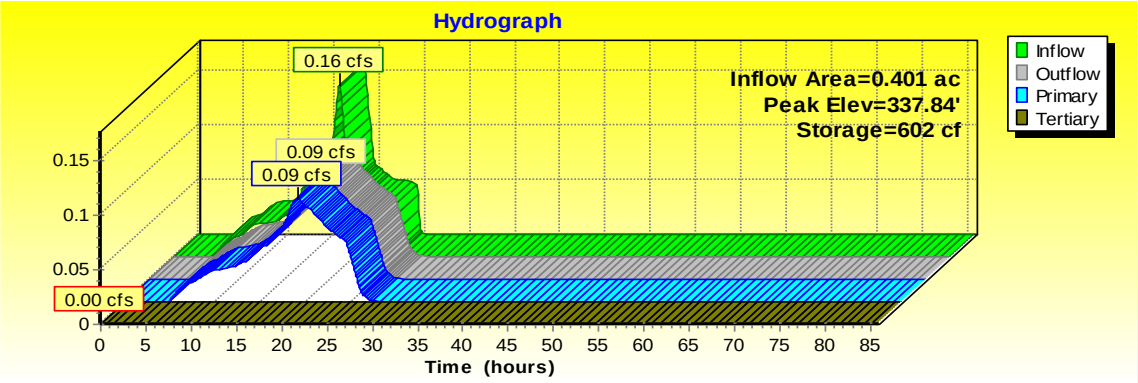
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

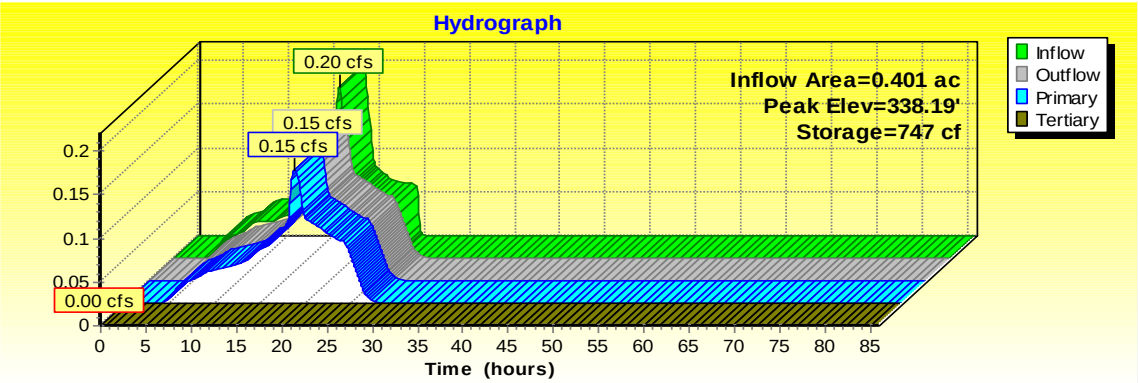
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

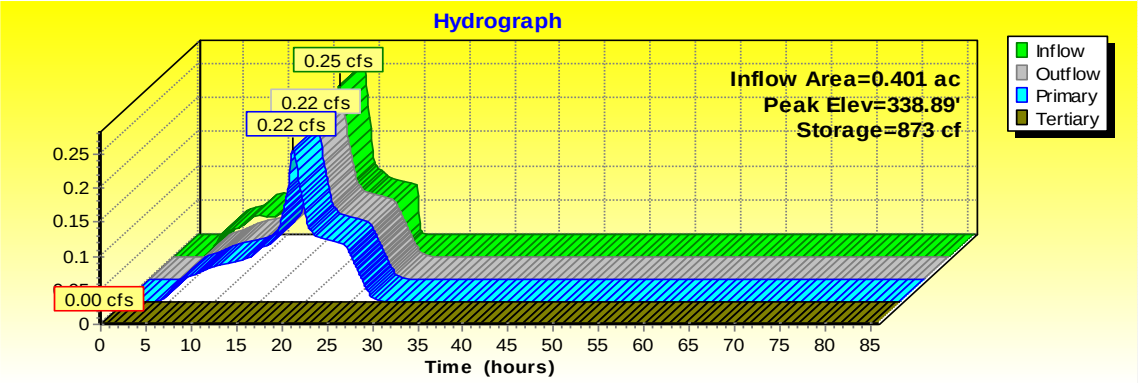
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

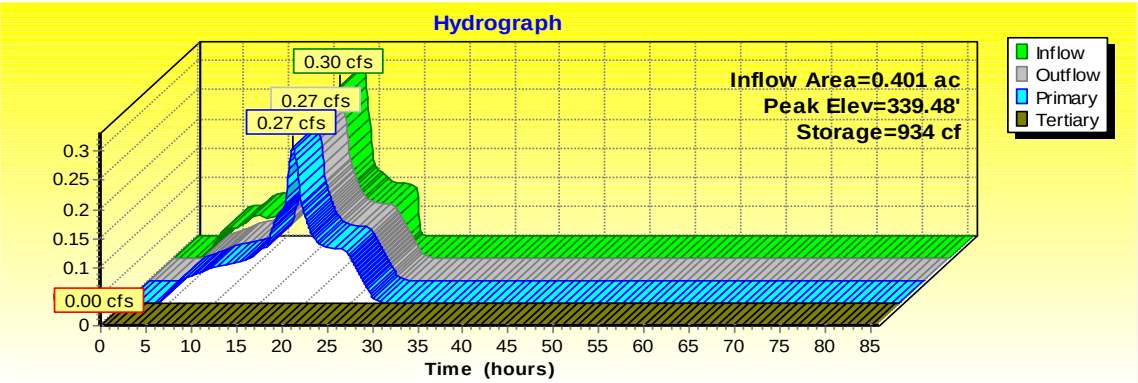
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

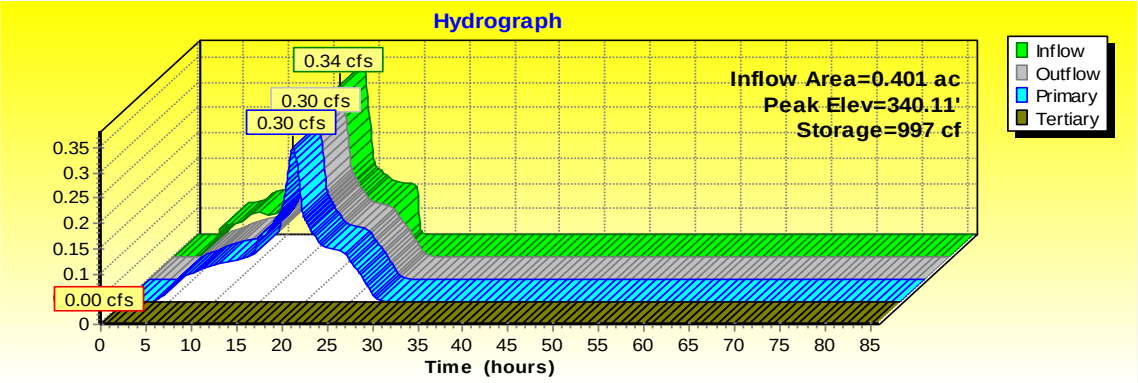
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

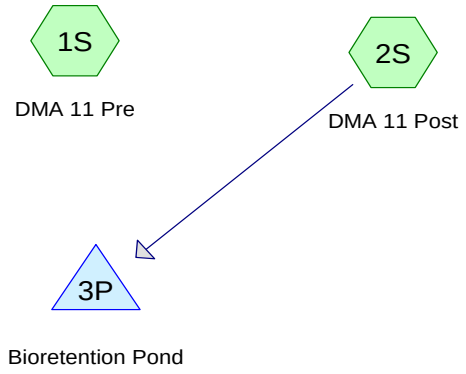
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 Event Summary



Events for Subcatchment 1S: DMA 11 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.016	0.47
2 year	2.90	0.09	0.039	1.18
5 year	3.84	0.13	0.063	1.91
10 year	4.62	0.17	0.084	2.56
25 year	5.72	0.22	0.116	3.53
50 year	6.59	0.27	0.142	4.32
100 year	**7.49**	**0.31**	**0.169**	**5.15**

Events for Subcatchment 2S: DMA 11 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.06	0.028	0.85
2 year	2.90	0.11	0.057	1.73
5 year	3.84	0.16	0.085	2.58
10 year	4.62	0.20	0.109	3.31
25 year	5.72	0.25	0.143	4.36
50 year	6.59	0.29	0.171	5.20
100 year	**7.49**	**0.34**	**0.200**	**6.07**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.06	0.04	0.04	**0.00**	337.70	217
2 year	0.11	0.06	0.06	0.00	338.47	542
5 year	0.16	0.08	0.08	0.00	339.73	901
10 year	0.20	0.18	0.18	0.00	340.69	1,001
25 year	0.26	0.23	0.23	0.00	341.21	1,077
50 year	0.30	0.28	0.28	0.00	341.25	1,114
100 year	**0.35**	**0.33**	**0.33**	0.00	**341.27**	**1,144**

DMA 11 Pre-Development

Summary for Subcatchment 1S: DMA 11 Pre

Runoff = 0.31 cfs @ 18.27 hrs, Volume= 0.169 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
17,206	80	>75% Grass cover, Good, HSG D
17,206		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 11 Post-Development

Summary for Subcatchment 2S: DMA 11 Post

Runoff = 0.34 cfs @ 18.27 hrs, Volume= 0.200 af, Depth= 6.07"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	10,061	98	Roofs
*	7,145	74	>75% Grass cover, Good, HSG C
	17,206	88	Weighted Average
	7,145		41.53% Pervious Area
	10,061		58.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 11 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.395 ac, 58.47% Impervious, Inflow Depth = 6.07" for 100 year event
Inflow = 0.35 cfs @ 18.13 hrs, Volume= 0.200 af
Outflow = 0.33 cfs @ 18.26 hrs, Volume= 0.200 af, Atten= 4%, Lag= 7.9 min
Primary = 0.33 cfs @ 18.26 hrs, Volume= 0.200 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 341.27' @ 18.26 hrs Surf.Area= 1,158 sf Storage= 1,144 cf

Plug-Flow detention time= 121.3 min calculated for 0.200 af (100% of inflow)
Center-of-Mass det. time= 119.6 min (1,044.4 - 924.8)

Volume	Invert	Avail.Storage	Storage Description
#1	337.18'	5,819 cf	**DMA 11 Bio-swale (Prismatic)** Listed below (Recalc)

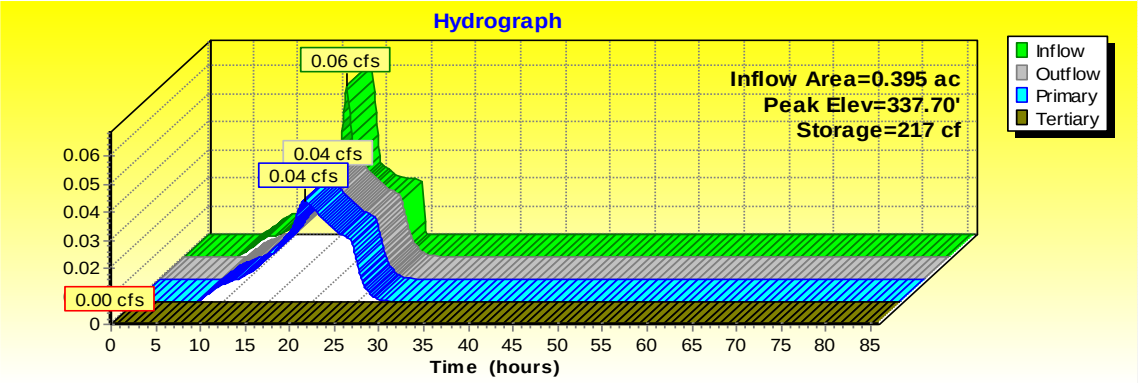
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.18	1,050	0.0	0	0
337.19	1,050	40.0	4	4
339.18	1,050	40.0	836	840
339.19	1,050	40.0	4	844
341.18	1,050	10.0	209	1,053
341.19	1,050	10.0	1	1,054
341.68	1,704	100.0	675	1,729
342.18	2,376	100.0	1,020	2,749
342.68	3,066	100.0	1,361	4,109
343.18	3,774	100.0	1,710	5,819

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.18'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.68'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.18'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	340.00'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	341.20'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.33 cfs @ 18.26 hrs HW=341.27' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.11 cfs @ 9.69 fps)
- **3=Orifice** (Orifice Controls 0.11 cfs @ 5.25 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.77 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.18' (Free Discharge)

DMA 11 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

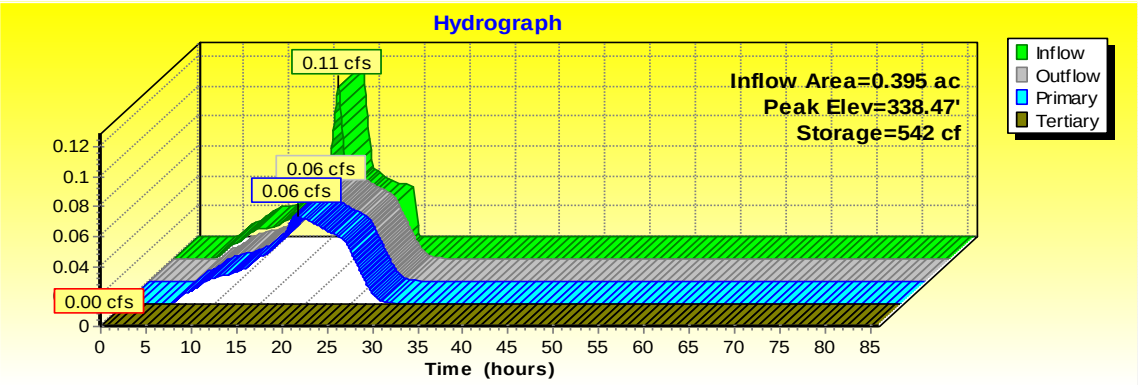
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

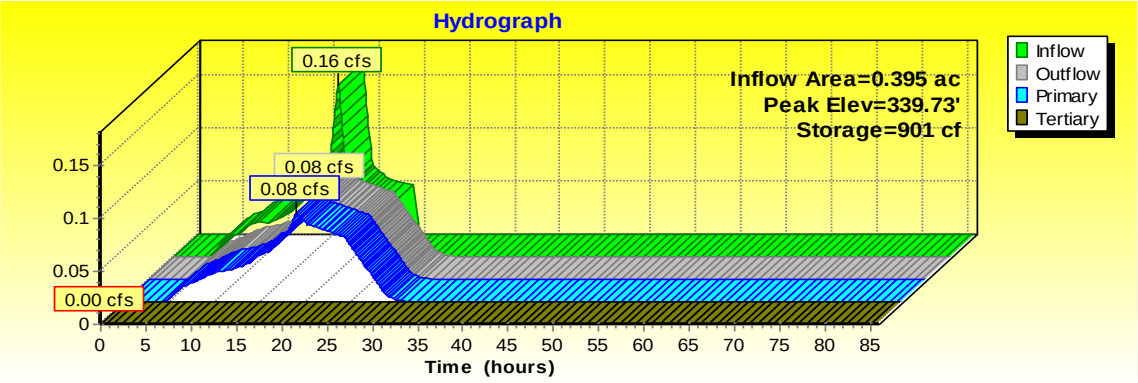
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

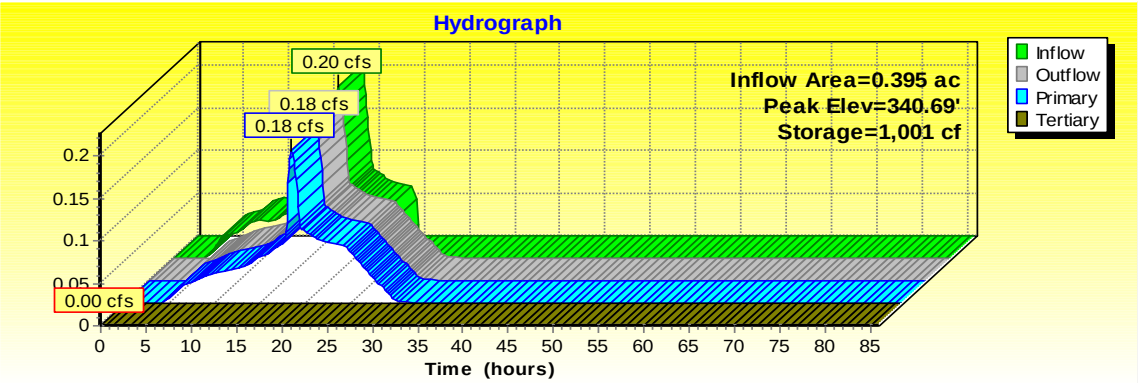
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

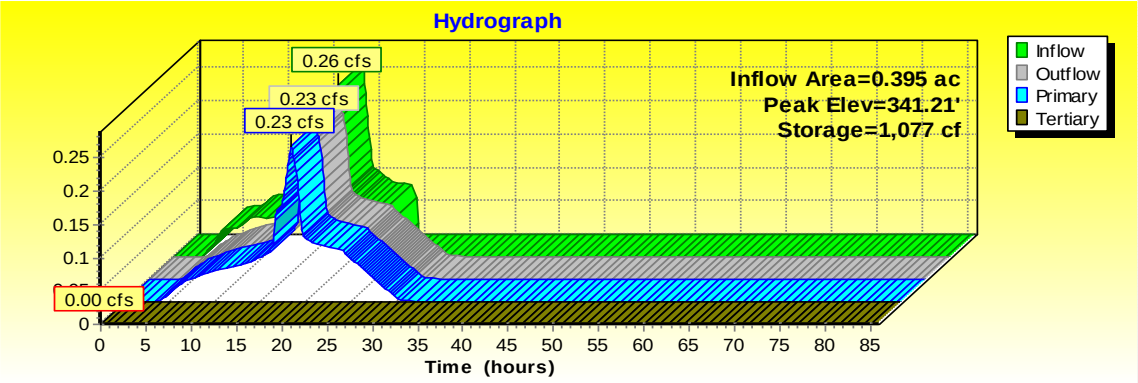
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

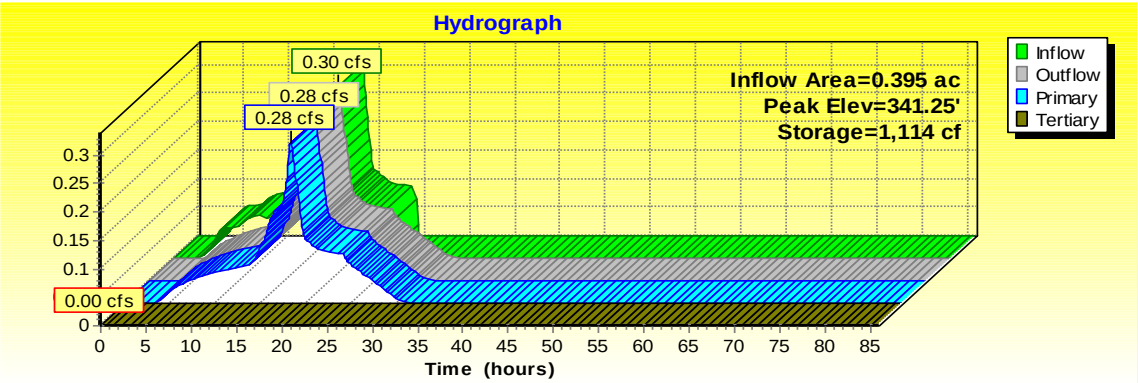
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

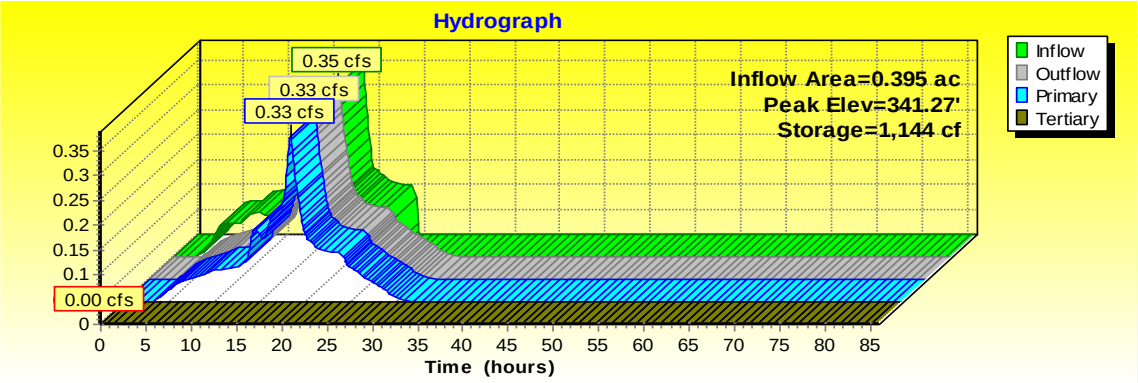
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

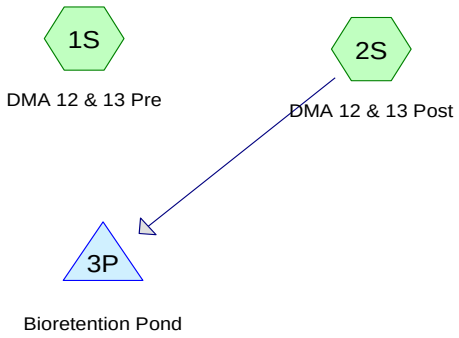
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 Event Summary



Events for Subcatchment 1S: DMA 12 & 13 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.05	0.020	0.47
2 year	2.90	0.11	0.050	1.18
5 year	3.84	0.17	0.081	1.91
10 year	4.62	0.23	0.108	2.56
25 year	5.72	0.30	0.149	3.53
50 year	6.59	0.36	0.182	4.32
100 year	**7.49**	**0.41**	**0.218**	**5.15**

Events for Subcatchment 2S: DMA 12 & 13 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.06	0.027	0.64
2 year	2.90	0.13	0.061	1.43
5 year	3.84	0.19	0.094	2.23
10 year	4.62	0.24	0.124	2.92
25 year	5.72	0.32	0.166	3.94
50 year	6.59	0.37	0.201	4.75
100 year	**7.49**	**0.43**	**0.237**	**5.61**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.06	0.05	0.05	**0.00**	337.67	134
2 year	0.13	0.09	0.09	0.00	338.15	348
5 year	0.19	0.18	0.18	0.00	338.42	467
10 year	0.24	0.22	0.22	0.00	338.55	522
25 year	0.32	0.28	0.28	0.00	338.76	618
50 year	0.37	0.32	0.32	0.00	338.97	709
100 year	**0.43**	**0.36**	**0.36**	0.00	**339.20**	**815**

DMA 12 & 13 Pre-Development

Summary for Subcatchment 1S: DMA 12 & 13 Pre

Runoff = 0.41 cfs @ 18.14 hrs, Volume= 0.218 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
22,085	80	>75% Grass cover, Good, HSG D
22,085		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 12 & 13 Post-Development

Summary for Subcatchment 2S: DMA 12 & 13 Post

Runoff = 0.43 cfs @ 18.13 hrs, Volume= 0.237 af, Depth= 5.61"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,492	98	Roofs
*	12,593	74	>75% Grass cover, Good, HSG C
	22,085	84	Weighted Average
	12,593		57.02% Pervious Area
	9,492		42.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 12 & 13 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.507 ac, 42.98% Impervious, Inflow Depth = 5.61" for 100 year event
Inflow = 0.43 cfs @ 18.13 hrs, Volume= 0.237 af
Outflow = 0.36 cfs @ 18.47 hrs, Volume= 0.237 af, Atten= 17%, Lag= 20.2 min
Primary = 0.36 cfs @ 18.47 hrs, Volume= 0.237 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
Peak Elev= 339.20' @ 18.47 hrs Surf.Area= 1,110 sf Storage= 815 cf

Plug-Flow detention time= 48.2 min calculated for 0.237 af (100% of inflow)
Center-of-Mass det. time= 48.5 min (996.3 - 947.8)

Volume	Invert	Avail.Storage	Storage Description
#1	337.37'	2,303 cf	**DMA 13 Bio-swale (Prismatic)** Listed below (Recalc)
#2	337.37'	4,203 cf	**DMA 12 Bio-swale (Prismatic)** Listed below (Recalc)
		6,506 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	360	0.0	0	0
337.38	360	40.0	1	1
339.37	360	40.0	287	288
339.38	360	40.0	1	289
341.37	360	10.0	72	361
341.38	360	10.0	0	361
341.87	651	100.0	248	609
342.37	960	100.0	403	1,012
342.87	1,287	100.0	562	1,574
343.37	1,632	100.0	730	2,303

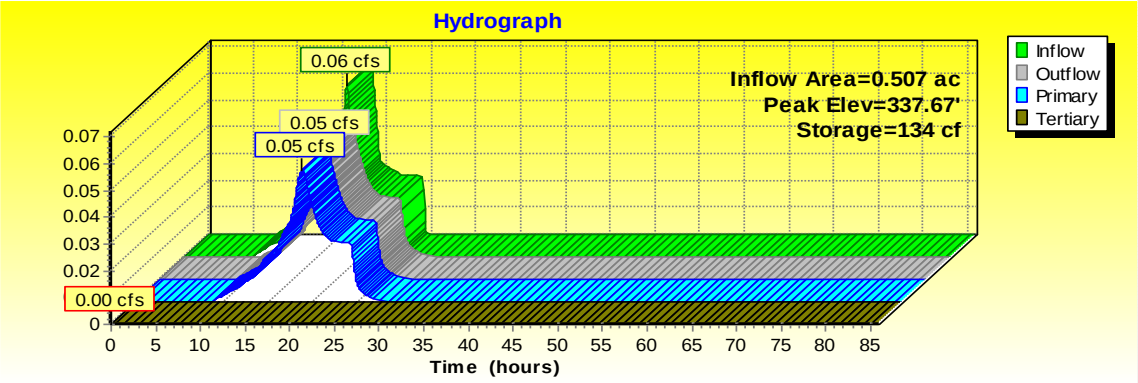
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	750	0.0	0	0
337.38	750	40.0	3	3
339.37	750	40.0	597	600
339.38	750	40.0	3	603
341.37	750	10.0	149	752
341.38	750	10.0	1	753
341.87	1,225	100.0	484	1,237
342.37	1,716	100.0	735	1,972
342.87	2,226	100.0	986	2,958
343.37	2,754	100.0	1,245	4,203

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.37'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.87'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.37'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.20'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.36 cfs @ 18.47 hrs HW=339.20' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.14 cfs @ 6.37 fps)
- **3=Orifice** (Orifice Controls 0.22 cfs @ 4.51 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.37' (Free Discharge)

DMA 12 & 13 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

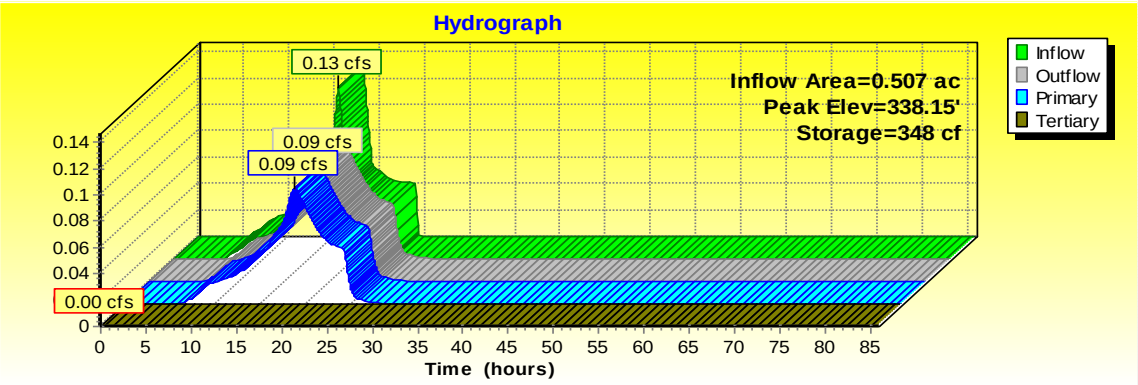
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

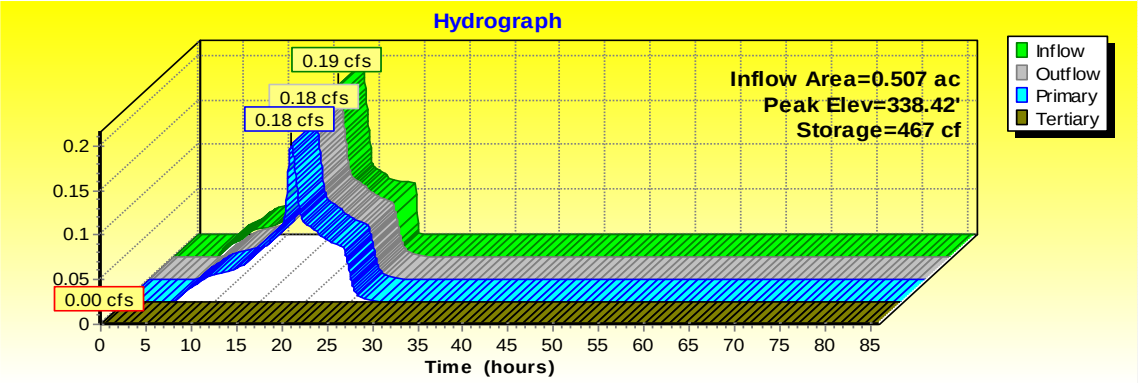
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

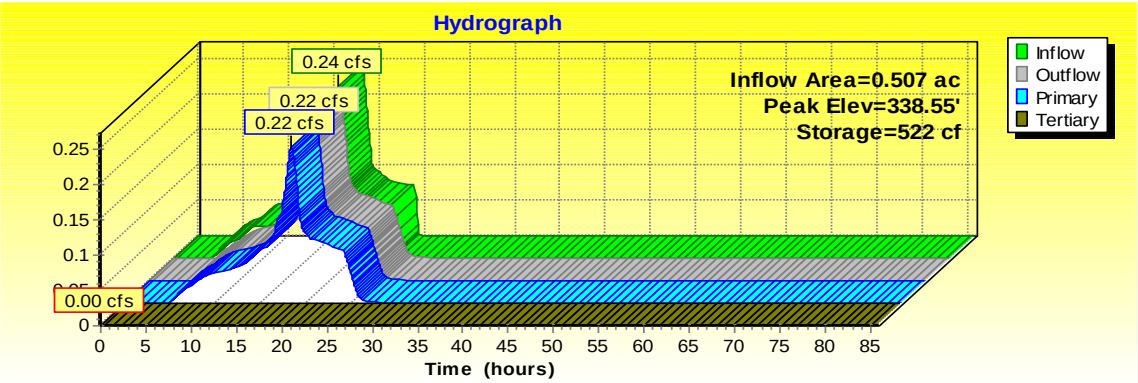
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

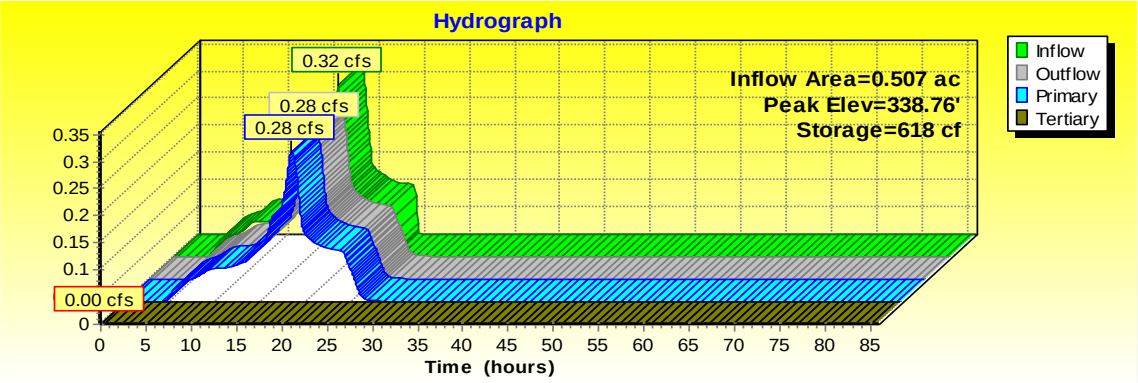
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

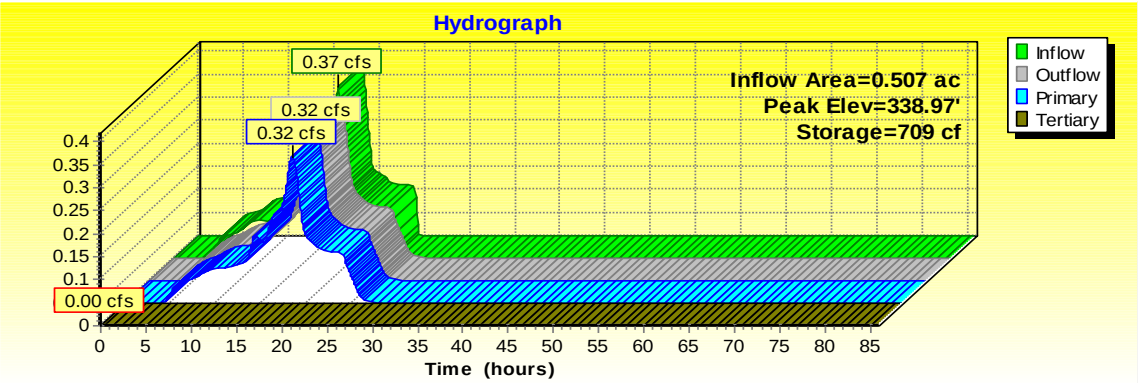
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

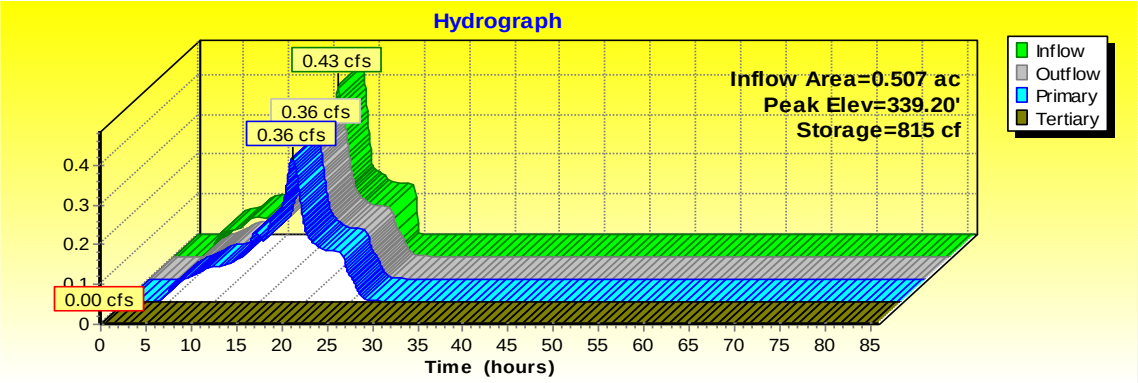
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

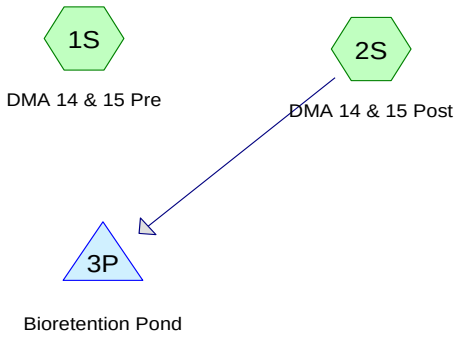
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 Event Summary



Events for Subcatchment 1S: DMA 14 & 15 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.034	0.47
2 year	2.90	0.19	0.085	1.18
5 year	3.84	0.30	0.138	1.91
10 year	4.62	0.39	0.186	2.56
25 year	5.72	0.51	0.256	3.53
50 year	6.59	0.61	0.313	4.32
100 year	**7.49**	**0.71**	**0.373**	**5.15**

Events for Subcatchment 2S: DMA 14 & 15 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.034	0.47
2 year	2.90	0.19	0.085	1.18
5 year	3.84	0.30	0.138	1.91
10 year	4.62	0.39	0.186	2.56
25 year	5.72	0.51	0.256	3.53
50 year	6.59	0.61	0.313	4.32
100 year	**7.49**	**0.71**	**0.373**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	337.52	76
2 year	0.19	0.18	0.18	0.00	337.65	139
5 year	0.30	0.27	0.27	0.00	337.83	231
10 year	0.39	0.34	0.34	0.00	338.03	330
25 year	0.51	0.47	0.47	0.00	338.32	481
50 year	0.61	0.58	0.58	0.00	338.45	545
100 year	**0.71**	**0.68**	**0.68**	0.00	**338.57**	**604**

DMA 14 & 15 Pre-Development

Summary for Subcatchment 1S: DMA 14 & 15 Pre

Runoff = 0.71 cfs @ 18.14 hrs, Volume= 0.373 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
37,854	80	>75% Grass cover, Good, HSG D
37,854		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 14 & 15 Post-Development

Summary for Subcatchment 2S: DMA 14 & 15 Post

Runoff = 0.71 cfs @ 18.14 hrs, Volume= 0.373 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,550	98	Roofs
*	28,304	74	>75% Grass cover, Good, HSG C
	37,854	80	Weighted Average
	28,304		74.77% Pervious Area
	9,550		25.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 14 & 15 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.869 ac, 25.23% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.71 cfs @ 18.14 hrs, Volume= 0.373 af
Outflow = 0.68 cfs @ 18.27 hrs, Volume= 0.373 af, Atten= 4%, Lag= 8.0 min
Primary = 0.68 cfs @ 18.27 hrs, Volume= 0.373 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
Peak Elev= 338.57' @ 18.27 hrs Surf.Area= 1,260 sf Storage= 604 cf

Plug-Flow detention time= 14.5 min calculated for 0.373 af (100% of inflow)
Center-of-Mass det. time= 14.6 min (983.6 - 969.0)

Volume	Invert	Avail.Storage	Storage Description
#1	337.37'	2,802 cf	**DMA 14 Bio-swale (Prismatic)** Listed below (Recalc)
#2	337.37'	4,939 cf	**DMA 15 Bio-swale (Prismatic)** Listed below (Recalc)
		7,742 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	460	0.0	0	0
337.38	460	40.0	2	2
339.37	460	40.0	366	368
339.38	460	40.0	2	370
341.37	460	10.0	92	461
341.38	460	10.0	0	462
341.87	826	100.0	315	777
342.37	1,210	100.0	509	1,286
342.87	1,612	100.0	706	1,991
343.37	1,632	100.0	811	2,802

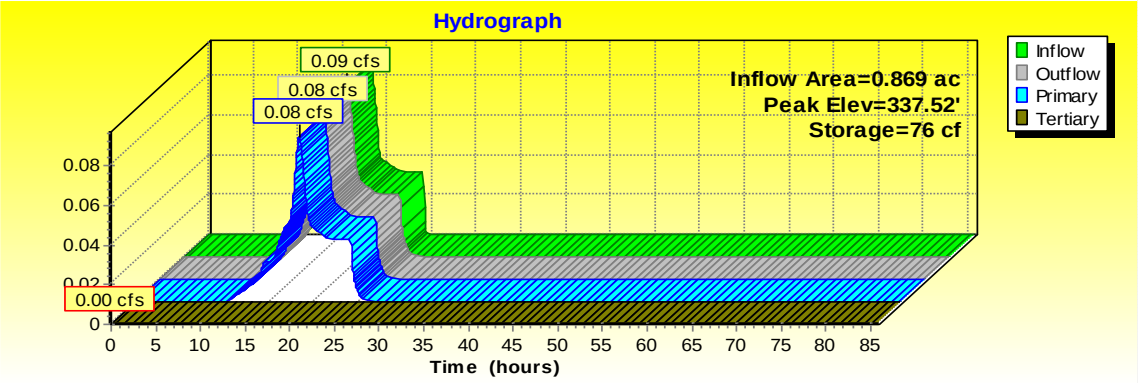
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	800	0.0	0	0
337.38	800	40.0	3	3
339.37	800	40.0	637	640
339.38	800	40.0	3	643
341.37	800	10.0	159	802
341.38	800	10.0	1	803
341.87	1,421	100.0	544	1,347
342.37	2,060	100.0	870	2,218
342.87	2,717	100.0	1,194	3,412
343.37	3,392	100.0	1,527	4,939

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.37'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.87'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.37'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.20'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.68 cfs @ 18.27 hrs HW=338.57' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.49 cfs @ 4.99 fps)
- **3=Orifice** (Orifice Controls 0.19 cfs @ 2.16 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.37' (Free Discharge)

DMA 14 & 15 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

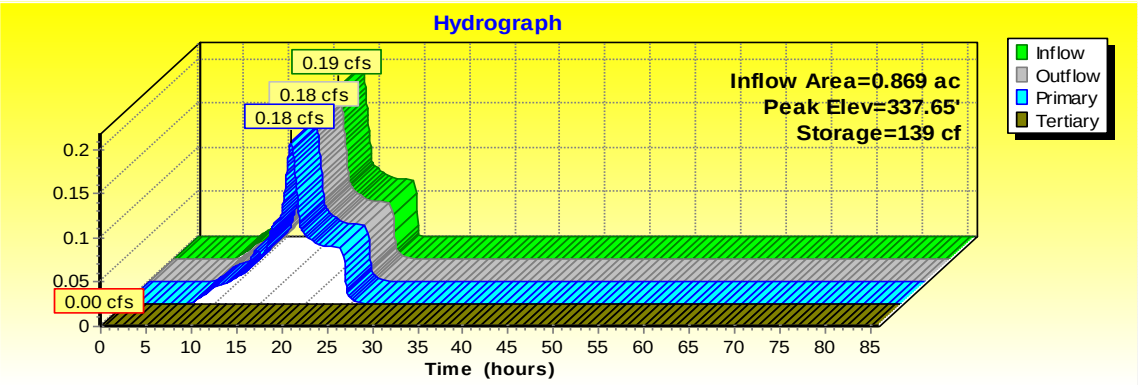
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

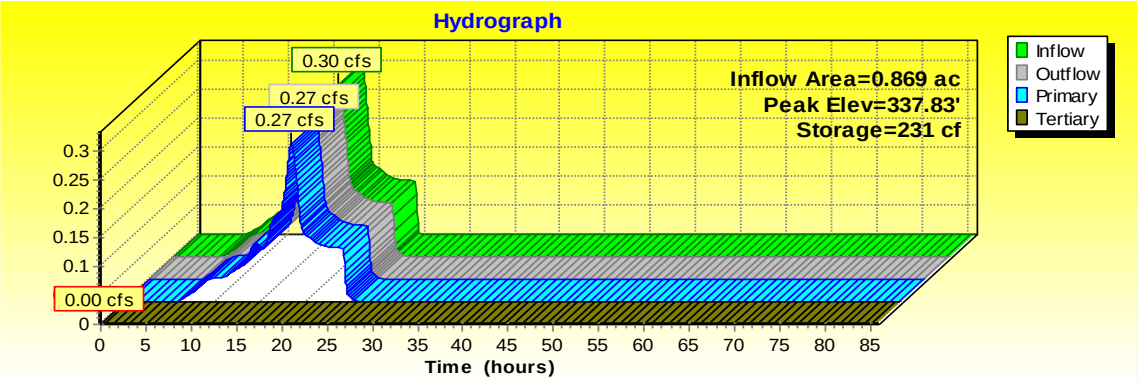
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

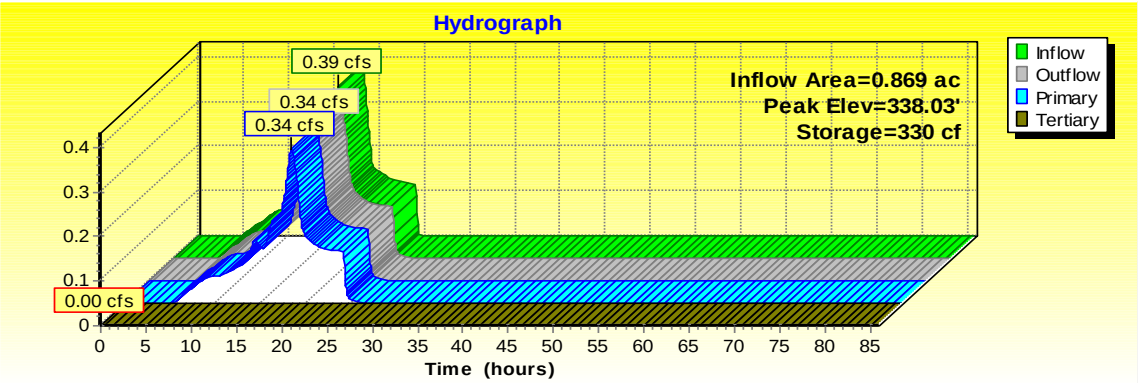
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

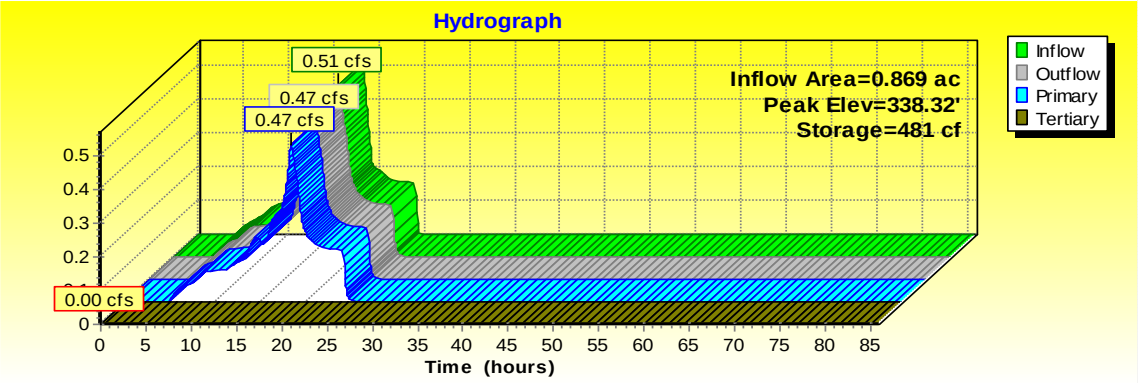
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

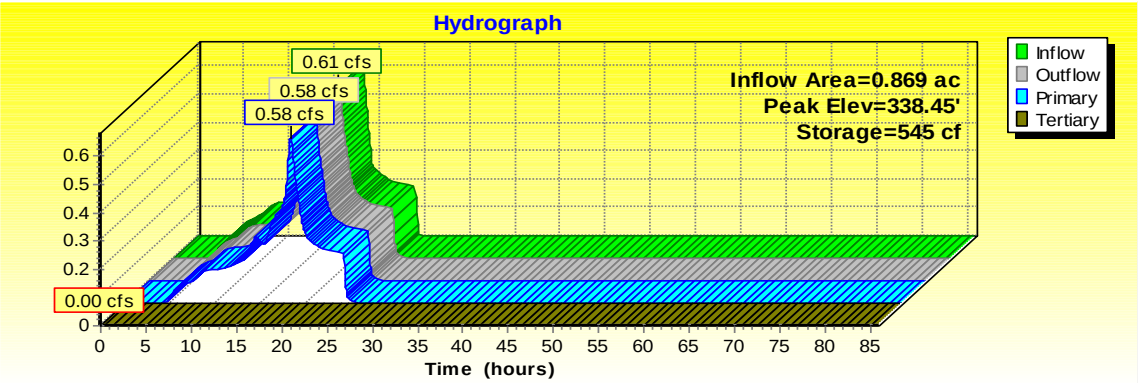
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

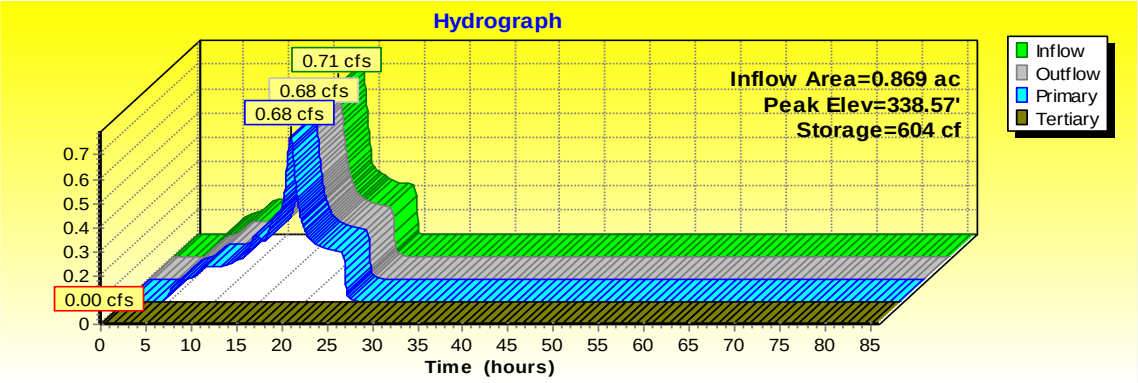
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

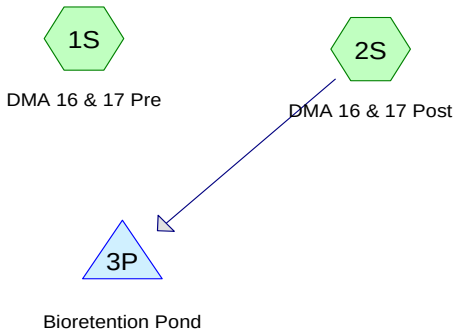
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 Event Summary



Events for Subcatchment 1S: DMA 16 & 17 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.08	0.034	0.47
2 year	2.90	0.19	0.084	1.18
5 year	3.84	0.28	0.136	1.91
10 year	4.62	0.37	0.183	2.56
25 year	5.72	0.49	0.252	3.53
50 year	6.59	0.58	0.308	4.32
100 year	**7.49**	**0.68**	**0.367**	**5.15**

Events for Subcatchment 2S: DMA 16 & 17 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.08	0.034	0.47
2 year	2.90	0.19	0.084	1.18
5 year	3.84	0.28	0.136	1.91
10 year	4.62	0.37	0.183	2.56
25 year	5.72	0.49	0.252	3.53
50 year	6.59	0.58	0.308	4.32
100 year	**7.49**	**0.68**	**0.367**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.08	0.07	0.07	**0.00**	337.08	107
2 year	0.19	0.15	0.15	0.00	337.46	301
5 year	0.28	0.21	0.21	0.00	337.99	572
10 year	0.37	0.33	0.33	0.00	338.27	716
25 year	0.49	0.43	0.43	0.00	338.60	886
50 year	0.58	0.51	0.51	0.00	338.95	1,038
100 year	**0.68**	**0.64**	**0.64**	0.00	**339.65**	**1,127**

DMA 16 & 17 Pre-Development

Summary for Subcatchment 1S: DMA 16 & 17 Pre

Runoff = 0.68 cfs @ 18.27 hrs, Volume= 0.367 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
37,287	80	>75% Grass cover, Good, HSG D
37,287		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 16 & 17 Post-Development

Summary for Subcatchment 2S: DMA 16 & 17 Post

Runoff = 0.68 cfs @ 18.27 hrs, Volume= 0.367 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,205	98	Roofs
*	28,082	74	>75% Grass cover, Good, HSG C
	37,287	80	Weighted Average
	28,082		75.31% Pervious Area
	9,205		24.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 16 & 17 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.856 ac, 24.69% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.68 cfs @ 18.27 hrs, Volume= 0.367 af
Outflow = 0.64 cfs @ 18.48 hrs, Volume= 0.367 af, Atten= 6%, Lag= 12.7 min
Primary = 0.64 cfs @ 18.48 hrs, Volume= 0.367 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 339.65' @ 18.48 hrs Surf.Area= 1,280 sf Storage= 1,127 cf

Plug-Flow detention time= 38.4 min calculated for 0.367 af (100% of inflow)
Center-of-Mass det. time= 36.5 min (1,014.8 - 978.3)

Volume	Invert	Avail.Storage	Storage Description
#1	336.87'	3,736 cf	**DMA 17 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.87'	4,220 cf	**DMA 16 Bio-swale (Prismatic)** Listed below (Recalc)
		7,956 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.87	600	0.0	0	0
336.88	600	40.0	2	2
338.87	600	40.0	478	480
338.88	600	40.0	2	482
340.87	600	10.0	119	602
340.88	600	10.0	1	602
341.37	1,071	100.0	409	1,012
341.88	1,560	100.0	671	1,683
342.37	2,067	100.0	889	2,571
342.87	2,592	100.0	1,165	3,736

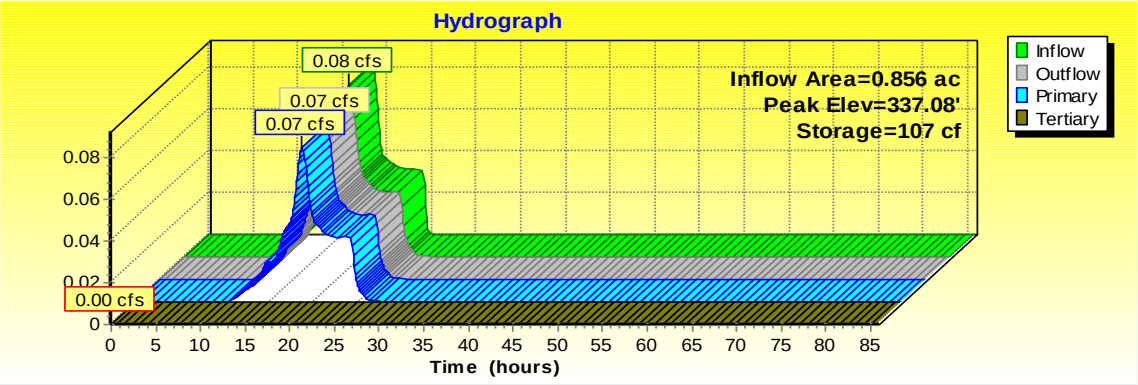
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.87	680	0.0	0	0
336.88	680	40.0	3	3
338.87	680	40.0	541	544
338.88	680	40.0	3	547
340.87	680	10.0	135	682
340.88	680	10.0	1	683
341.37	1,211	100.0	463	1,146
341.87	1,760	100.0	743	1,889
342.37	2,327	100.0	1,022	2,911
342.87	2,912	100.0	1,310	4,220

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.87'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.37'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.87'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.64 cfs @ 18.48 hrs HW=339.64' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.34 cfs @ 7.89 fps)
- **3=Orifice** (Orifice Controls 0.29 cfs @ 5.93 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.87' (Free Discharge)

DMA 16 & 17 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

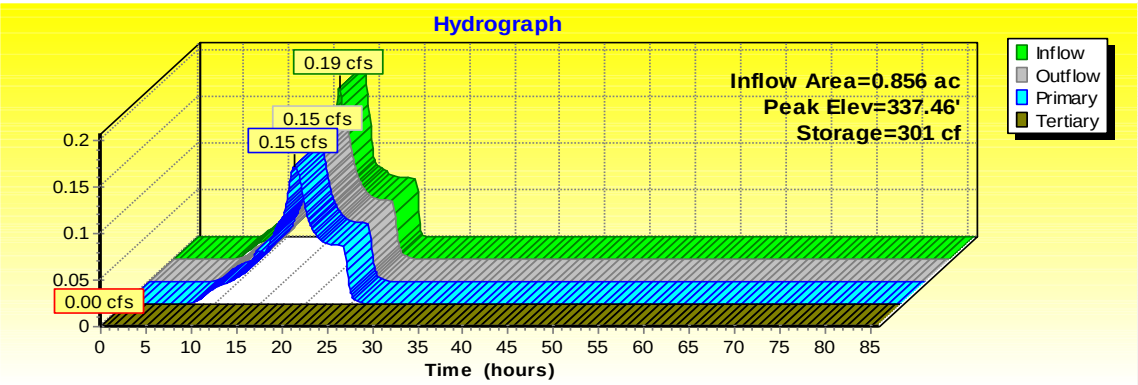
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

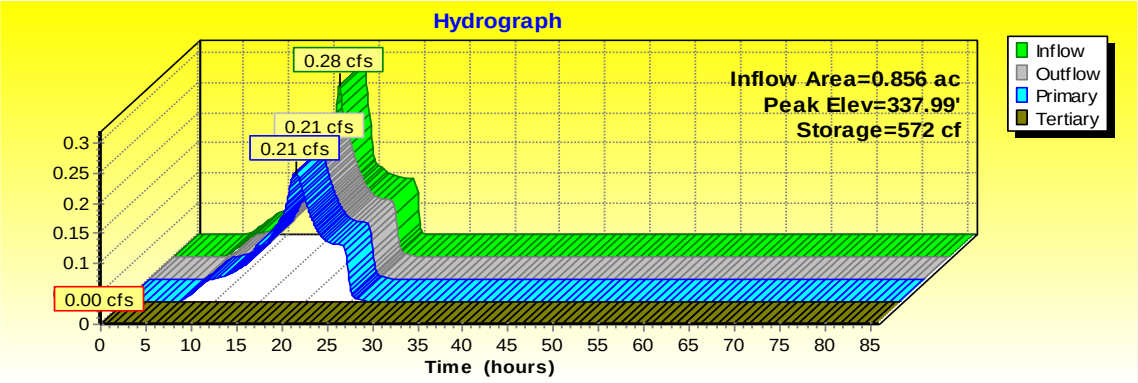
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

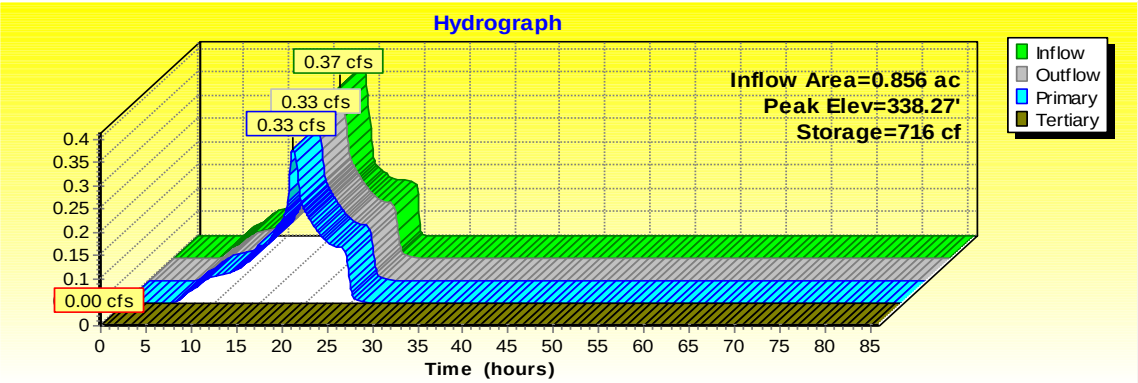
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

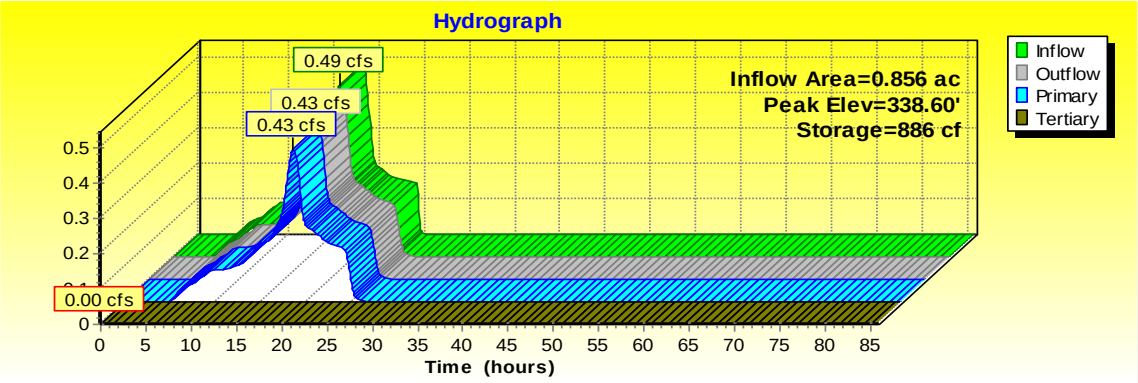
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

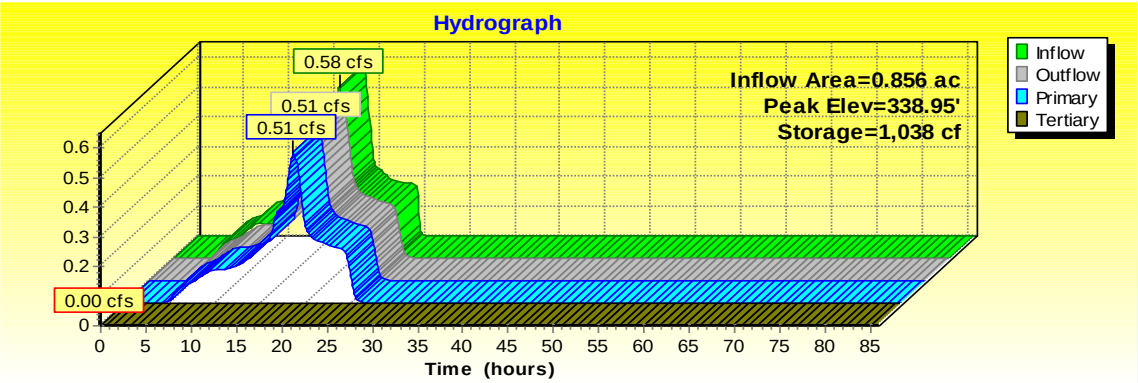
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

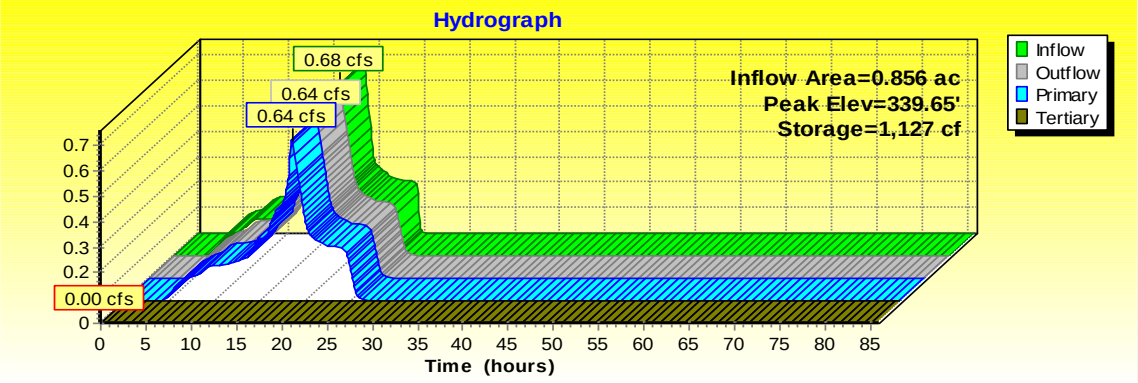
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

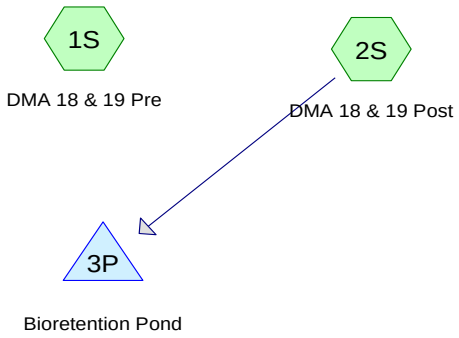
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 Event Summary



Events for Subcatchment 1S: DMA 18 & 19 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.14	0.058	0.47
2 year	2.90	0.32	0.144	1.18
5 year	3.84	0.49	0.234	1.91
10 year	4.62	0.63	0.314	2.56
25 year	5.72	0.84	0.432	3.53
50 year	6.59	1.00	0.529	4.32
100 year	**7.49**	**1.16**	**0.631**	**5.15**

Events for Subcatchment 2S: DMA 18 & 19 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.18	0.078	0.64
2 year	2.90	0.37	0.176	1.43
5 year	3.84	0.54	0.273	2.23
10 year	4.62	0.69	0.358	2.92
25 year	5.72	0.89	0.482	3.94
50 year	6.59	1.05	0.582	4.75
100 year	**7.49**	**1.22**	**0.687**	**5.61**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.18	0.14	0.14	**0.00**	336.45	376
2 year	0.37	0.26	0.26	0.00	336.91	972
5 year	0.54	0.35	0.35	0.00	337.48	1,719
10 year	0.69	0.42	0.42	0.00	338.05	2,457
25 year	0.89	0.57	0.57	0.00	338.97	3,588
50 year	1.05	0.75	0.75	0.00	339.50	4,245
100 year	**1.22**	**0.93**	**0.93**	0.00	**340.05**	**4,914**

DMA 18 & 19 Pre-Development

Summary for Subcatchment 1S: DMA 18 & 19 Pre

Runoff = 1.16 cfs @ 18.27 hrs, Volume= 0.631 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
64,033	80	>75% Grass cover, Good, HSG D
64,033		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 18 & 19 Post-Development

Summary for Subcatchment 2S: DMA 18 & 19 Post

Runoff = 1.22 cfs @ 18.27 hrs, Volume= 0.687 af, Depth= 5.61"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	27,929	98	Roofs
*	36,104	74	>75% Grass cover, Good, HSG C
	64,033	84	Weighted Average
	36,104		56.38% Pervious Area
	27,929		43.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 18 & 19 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.470 ac, 43.62% Impervious, Inflow Depth = 5.61" for 100 year event
Inflow = 1.22 cfs @ 18.27 hrs, Volume= 0.687 af
Outflow = 0.93 cfs @ 18.77 hrs, Volume= 0.687 af, Atten= 23%, Lag= 30.0 min
Primary = 0.93 cfs @ 18.77 hrs, Volume= 0.687 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.05' @ 18.77 hrs Surf.Area= 3,250 sf Storage= 4,914 cf

Plug-Flow detention time= 86.4 min calculated for 0.686 af (100% of inflow)
Center-of-Mass det. time= 86.9 min (1,043.9 - 957.0)

Volume	Invert	Avail.Storage	Storage Description
#1	336.16'	9,940 cf	**DMA 19 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.16'	7,350 cf	**DMA 18 Bio-swale (Prismatic)** Listed below (Recalc)
		17,289 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.16	2,250	0.0	0	0
336.17	2,250	40.0	9	9
338.16	2,250	40.0	1,791	1,800
338.17	2,250	40.0	9	1,809
340.16	2,250	10.0	448	2,257
340.17	2,250	10.0	2	2,259
340.66	3,036	100.0	1,295	3,554
341.16	3,840	100.0	1,719	5,273
341.66	4,662	100.0	2,126	7,399
342.16	5,502	100.0	2,541	9,940

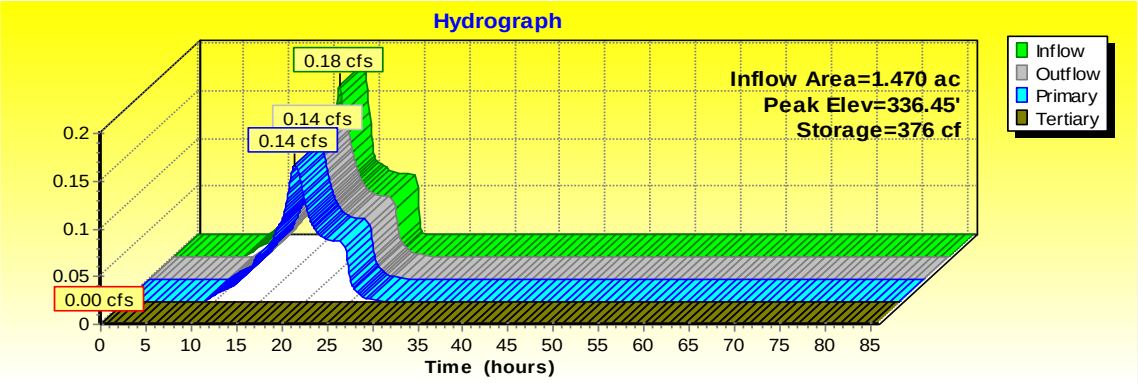
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.16	1,000	0.0	0	0
336.17	1,000	40.0	4	4
338.16	1,000	40.0	796	800
338.17	1,000	40.0	4	804
340.17	1,000	100.0	2,000	2,804
340.66	1,624	100.0	643	3,447
341.16	2,266	100.0	973	4,419
341.66	2,926	100.0	1,298	5,717
342.16	3,604	100.0	1,633	7,350

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.16'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.66'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.16'	**2.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.80'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.92 cfs @ 18.77 hrs HW=340.05' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.61 cfs @ 9.39 fps)
- **3=Orifice** (Orifice Controls 0.25 cfs @ 5.10 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.63 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.16' (Free Discharge)

DMA 18 & 19 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

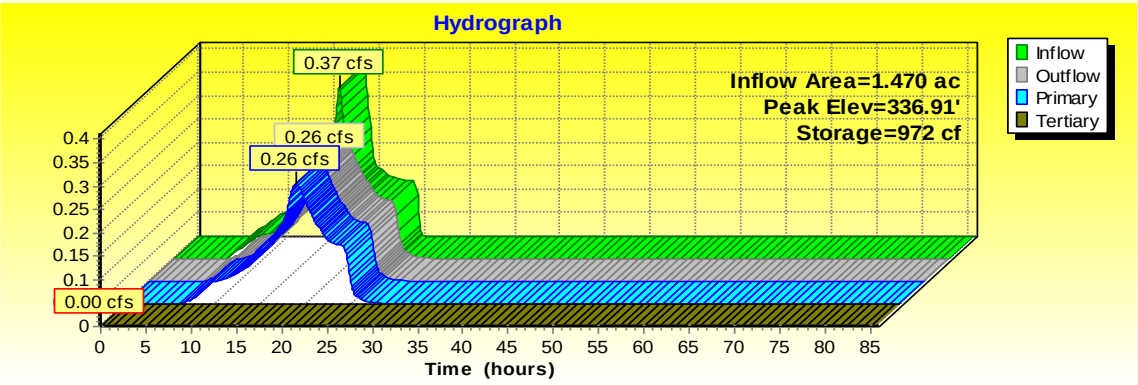
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

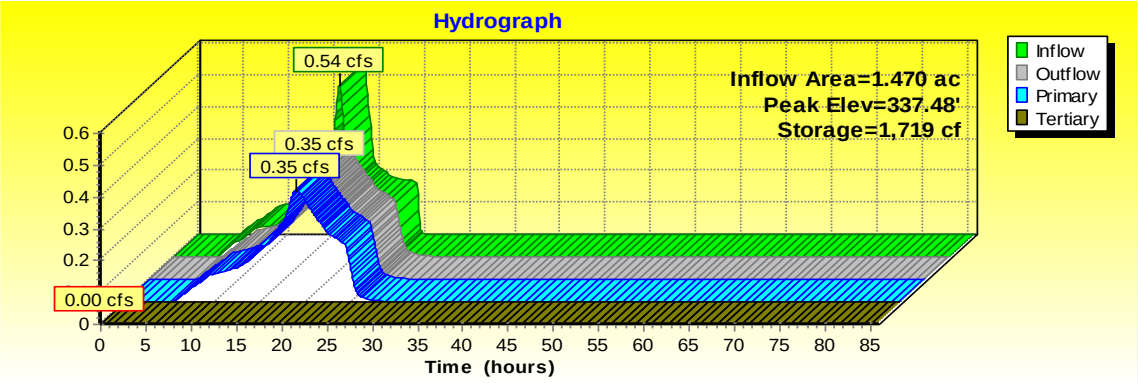
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

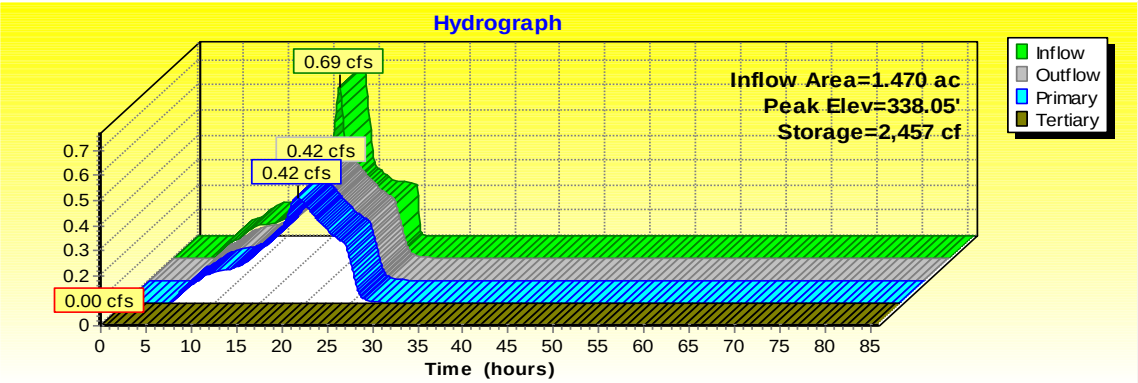
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

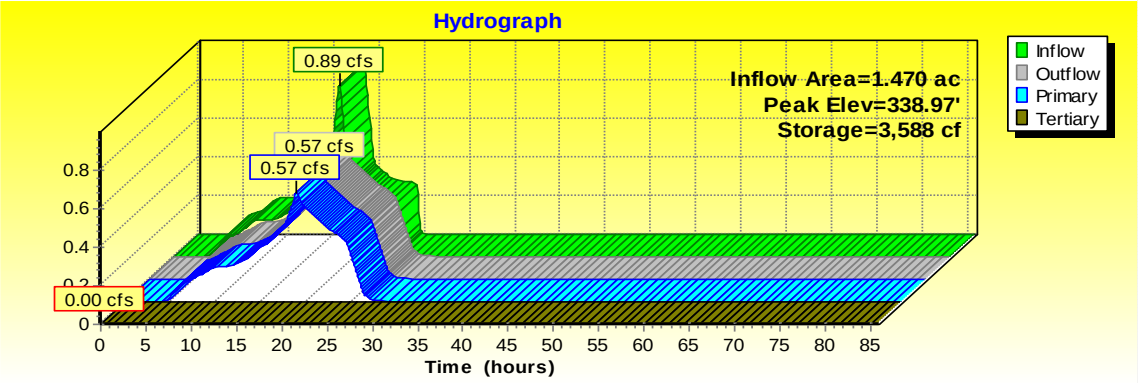
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

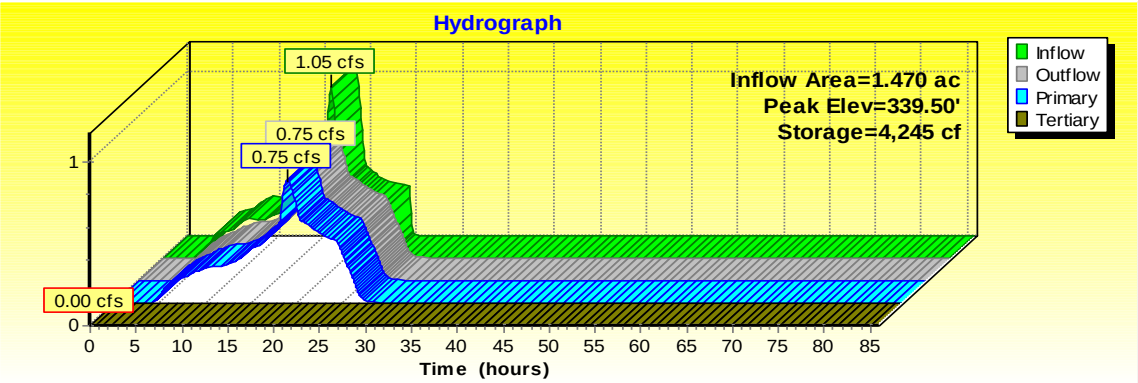
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

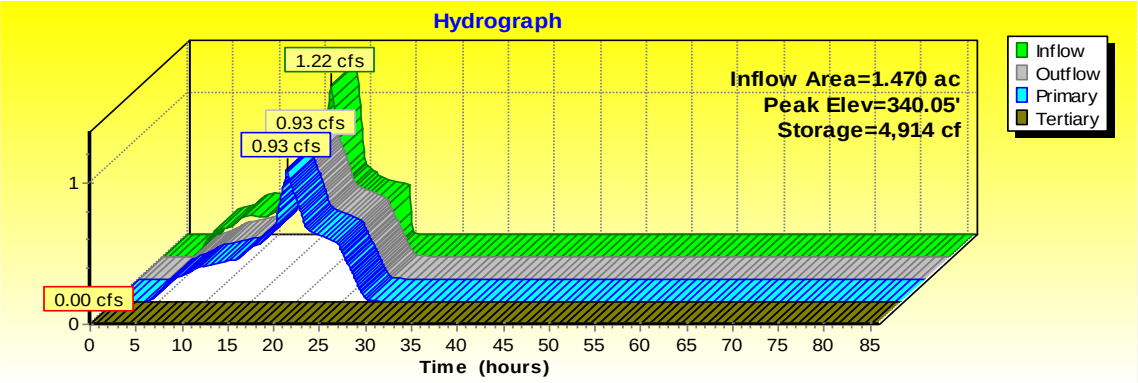
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

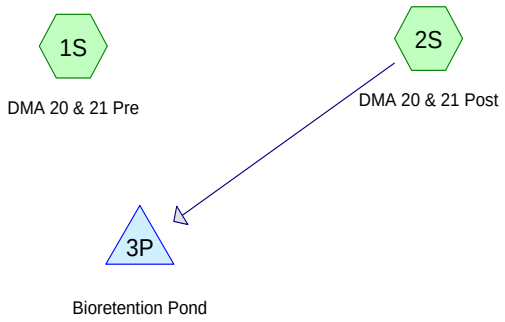
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 Event Summary



Events for Subcatchment 1S: DMA 20 & 21 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.043	0.47
2 year	2.90	0.24	0.107	1.18
5 year	3.84	0.37	0.173	1.91
10 year	4.62	0.48	0.233	2.56
25 year	5.72	0.64	0.320	3.53
50 year	6.59	0.76	0.392	4.32
100 year	**7.49**	**0.89**	**0.467**	**5.15**

Events for Subcatchment 2S: DMA 20 & 21 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.046	0.51
2 year	2.90	0.25	0.112	1.24
5 year	3.84	0.38	0.180	1.99
10 year	4.62	0.49	0.241	2.65
25 year	5.72	0.64	0.329	3.63
50 year	6.59	0.76	0.402	4.43
100 year	**7.49**	**0.89**	**0.478**	**5.26**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.11	0.11	0.11	**0.00**	336.31	123
2 year	0.25	0.23	0.23	0.00	336.49	245
5 year	0.38	0.33	0.33	0.00	336.74	421
10 year	0.49	0.41	0.41	0.00	337.01	607
25 year	0.64	0.52	0.52	0.00	337.47	924
50 year	0.76	0.60	0.60	0.00	337.89	1,213
100 year	**0.89**	**0.80**	**0.80**	0.00	**338.45**	**1,434**

DMA 20 & 21 Pre-Development

Summary for Subcatchment 1S: DMA 20 & 21 Pre

Runoff = 0.89 cfs @ 18.14 hrs, Volume= 0.467 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
47,437	80	>75% Grass cover, Good, HSG D
47,437		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 20 & 21 Post-Development

Summary for Subcatchment 2S: DMA 20 & 21 Post

Runoff = 0.89 cfs @ 18.21 hrs, Volume= 0.478 af, Depth= 5.26"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
14,748	98	Roofs, HSG C
32,689	74	>75% Grass cover, Good, HSG C
47,437	81	Weighted Average
32,689		68.91% Pervious Area
14,748		31.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 20 & 21 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.089 ac, 31.09% Impervious, Inflow Depth = 5.26" for 100 year event
Inflow = 0.89 cfs @ 18.21 hrs, Volume= 0.478 af
Outflow = 0.80 cfs @ 18.45 hrs, Volume= 0.478 af, Atten= 10%, Lag= 14.6 min
Primary = 0.80 cfs @ 18.45 hrs, Volume= 0.478 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 338.45' @ 18.45 hrs Surf.Area= 1,725 sf Storage= 1,434 cf

Plug-Flow detention time= 23.8 min calculated for 0.478 af (100% of inflow)
Center-of-Mass det. time= 23.6 min (992.1 - 968.5)

Volume	Invert	Avail.Storage	Storage Description
#1	336.13'	4,881 cf	**DMA 21 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.13'	4,749 cf	**DMA 20 Bio-swale (Prismatic)** Listed below (Recalc)
		9,630 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.13	875	0.0	0	0
336.14	875	40.0	3	3
338.13	875	40.0	697	700
338.14	875	10.0	1	701
340.13	875	10.0	174	875
340.14	875	100.0	9	884
340.63	1,424	100.0	563	1,447
341.13	1,991	100.0	854	2,301
341.63	2,576	100.0	1,142	3,443
342.13	3,179	100.0	1,439	4,881

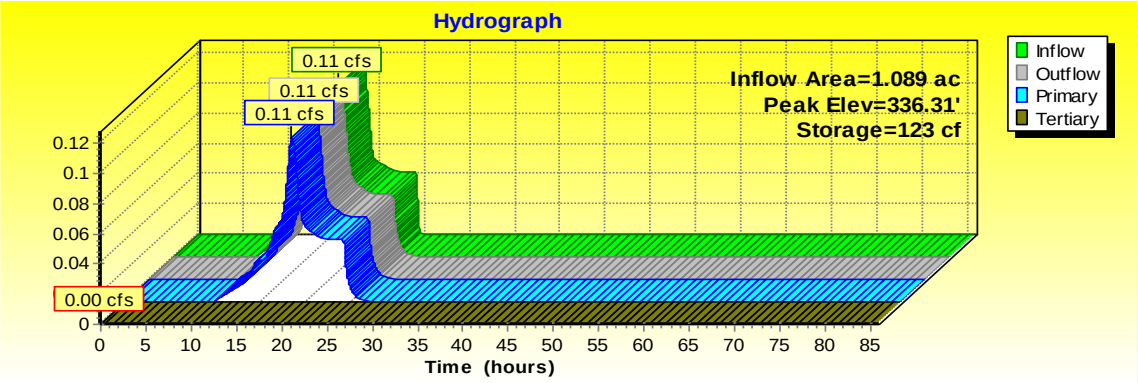
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.13	850	0.0	0	0
336.14	850	40.0	3	3
338.13	850	40.0	677	680
338.14	850	10.0	1	681
340.13	850	10.0	169	850
340.63	1,384	100.0	559	1,409
341.13	1,936	100.0	830	2,239
341.63	2,506	100.0	1,111	3,349
342.13	3,094	100.0	1,400	4,749

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.13'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.13'	**24.0" W x 24.0" H Vert. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.13'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.13'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.80 cfs @ 18.45 hrs HW=338.45' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.70 cfs @ 7.13 fps)
- **3=Orifice** (Orifice Controls 0.10 cfs @ 2.32 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.13' (Free Discharge)

DMA 20 & 21 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

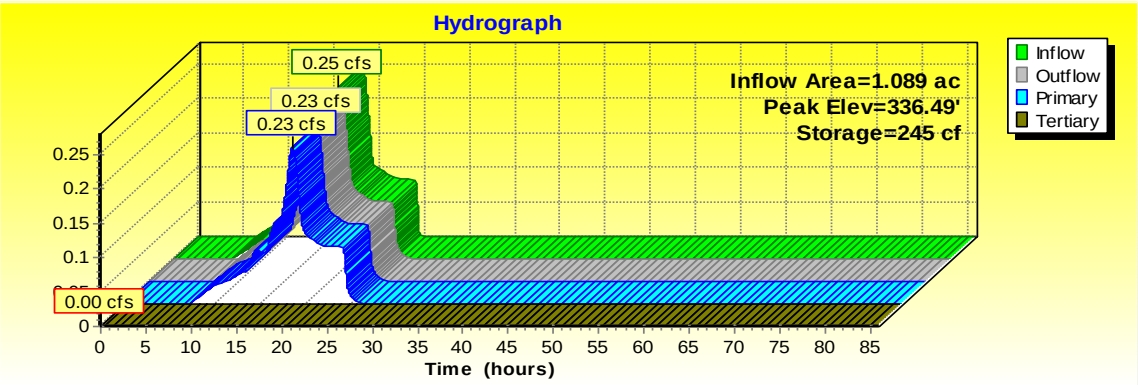
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

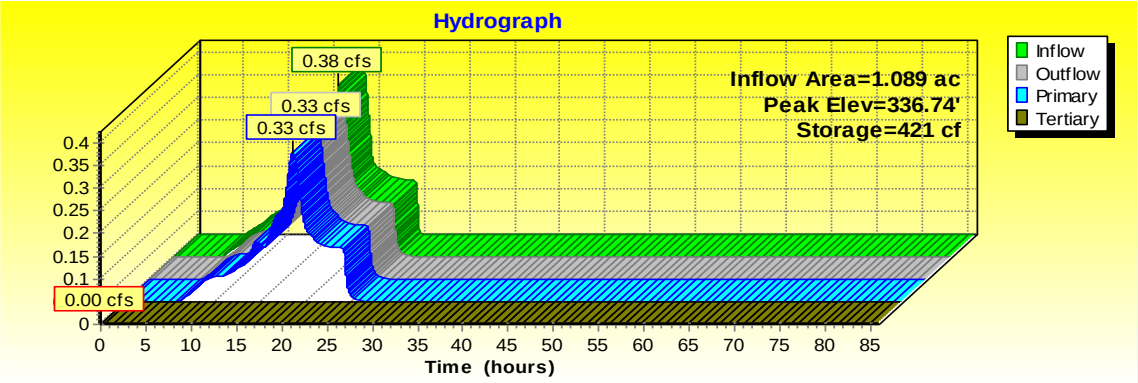
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

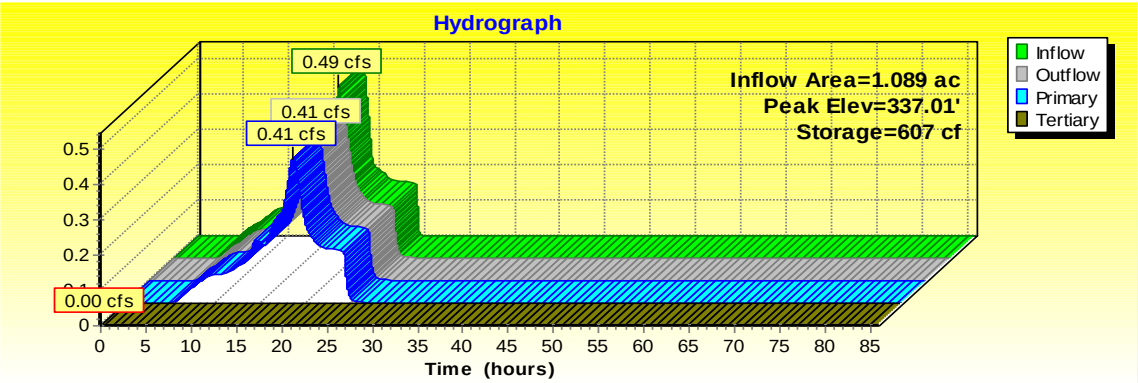
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

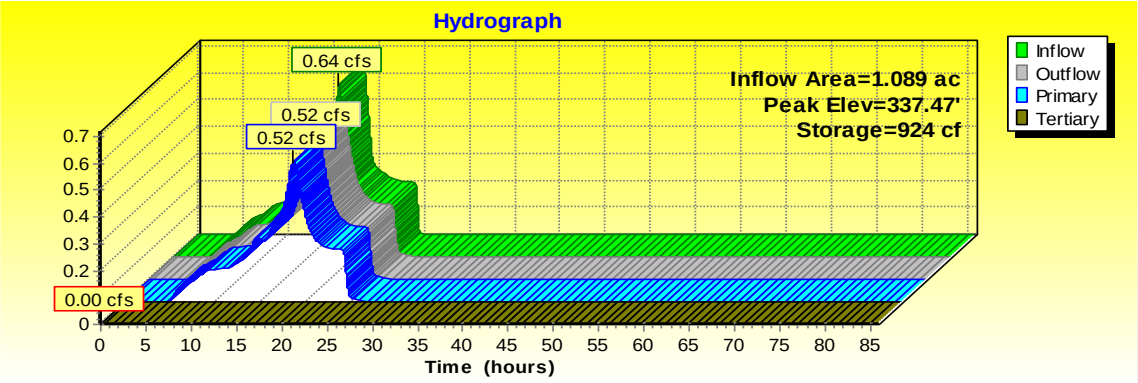
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

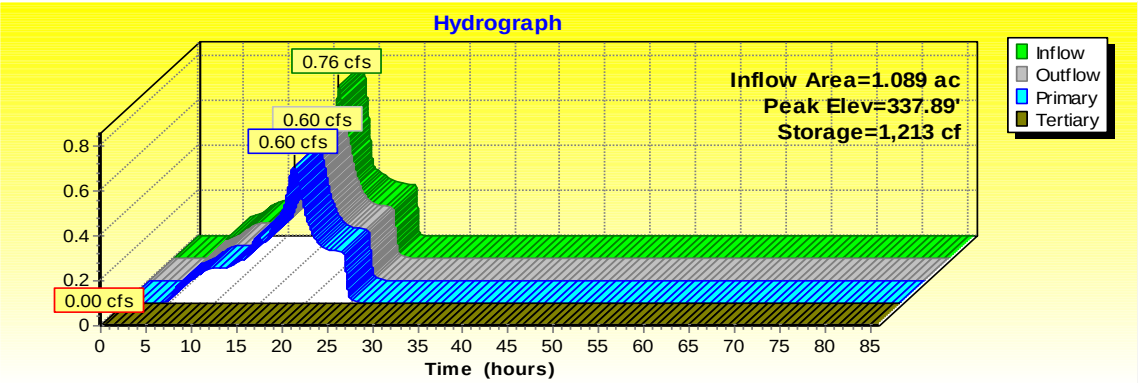
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

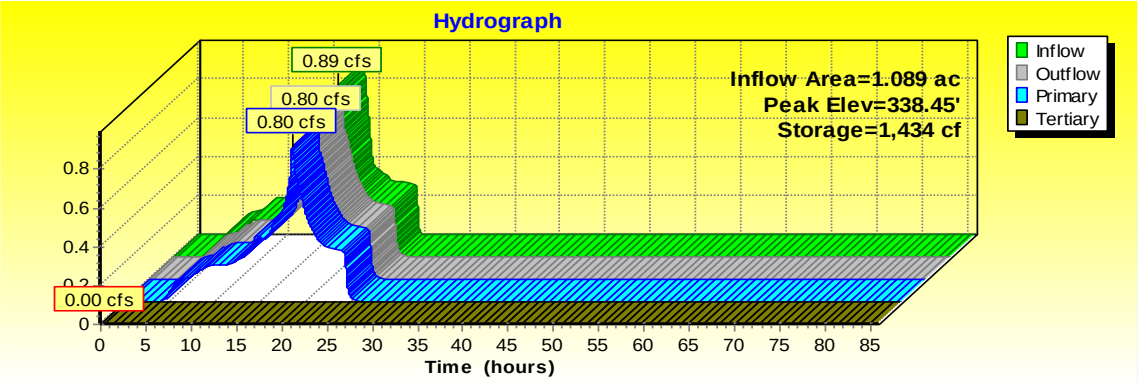
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

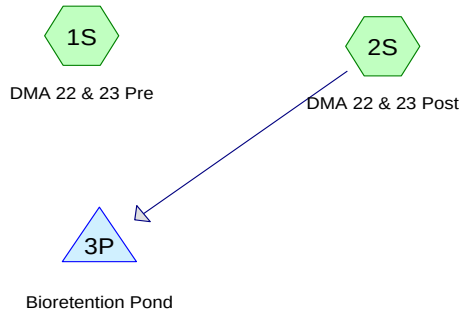
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 Event Summary



Events for Subcatchment 1S: DMA 22 & 23 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.038	0.47
1 year	2.21	0.14	0.056	0.69
2 year	2.90	0.22	0.094	1.18
5 year	3.84	0.33	0.153	1.91
10 year	4.62	0.43	0.206	2.56
25 year	5.72	0.57	0.283	3.53
50 year	6.59	0.68	0.346	4.32
100 year	**7.49**	**0.79**	**0.413**	**5.15**

Events for Subcatchment 2S: DMA 22 & 23 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.044	0.55
1 year	2.21	0.15	0.063	0.79
2 year	2.90	0.23	0.104	1.30
5 year	3.84	0.34	0.166	2.07
10 year	4.62	0.44	0.220	2.74
25 year	5.72	0.58	0.299	3.73
50 year	6.59	0.68	0.364	4.53
100 year	**7.49**	**0.79**	**0.432**	**5.38**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.11	0.10	0.10	**0.00**	337.83	116
1 year	0.15	0.13	0.13	0.00	337.91	165
2 year	0.23	0.19	0.19	0.00	338.11	293
5 year	0.34	0.27	0.27	0.00	338.49	536
10 year	0.44	0.36	0.36	0.00	338.83	754
25 year	0.58	0.47	0.47	0.00	339.28	1,045
50 year	0.68	0.55	0.55	0.00	339.75	1,297
100 year	**0.79**	**0.79**	**0.79**	0.00	**340.10**	**1,352**

DMA 22 & 23 Pre-Development

Summary for Subcatchment 1S: DMA 22 & 23 Pre

Runoff = 0.79 cfs @ 18.14 hrs, Volume= 0.413 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
41,948	80	>75% Grass cover, Good, HSG D
41,948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 22 & 23 Post-Development

Summary for Subcatchment 2S: DMA 22 & 23 Post

Runoff = 0.79 cfs @ 18.21 hrs, Volume= 0.432 af, Depth= 5.38"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
13,132	98	Roofs, HSG C
28,816	74	>75% Grass cover, Good, HSG C
41,948	82	Weighted Average
28,816		68.69% Pervious Area
13,132		31.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 22 & 23 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.963 ac, 31.31% Impervious, Inflow Depth = 5.38" for 100 year event
Inflow = 0.79 cfs @ 18.21 hrs, Volume= 0.432 af
Outflow = 0.79 cfs @ 18.23 hrs, Volume= 0.432 af, Atten= 0%, Lag= 1.3 min
Primary = 0.79 cfs @ 18.23 hrs, Volume= 0.432 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.10' @ 18.23 hrs Surf.Area= 1,600 sf Storage= 1,352 cf

Plug-Flow detention time= 31.4 min calculated for 0.432 af (100% of inflow)
Center-of-Mass det. time= 31.2 min (994.5 - 963.2)

Volume	Invert	Avail.Storage	Storage Description
#1	337.65'	3,958 cf	**DMA 22 bio-swale (Prismatic)** Listed below (Recalc)
#2	337.65'	4,223 cf	**DMA 23 bio-swale (Prismatic)** Listed below (Recalc)
		8,182 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.65	600	0.0	0	0
337.66	600	40.0	2	2
339.65	600	40.0	478	480
339.66	600	10.0	1	481
340.65	600	10.0	59	540
340.66	600	100.0	6	546
341.15	1,224	100.0	447	993
341.65	1,716	100.0	735	1,728
342.15	2,226	100.0	986	2,713
342.65	2,754	100.0	1,245	3,958

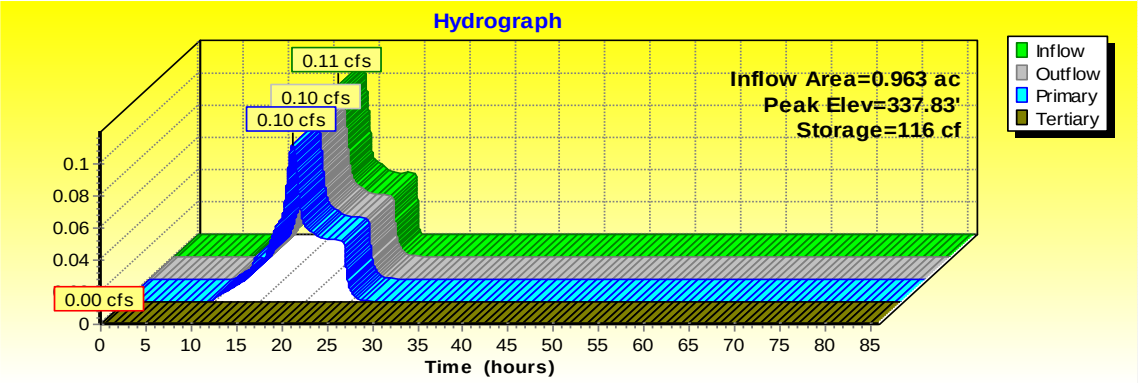
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.65	1,000	0.0	0	0
337.66	1,000	40.0	4	4
339.65	1,000	40.0	796	800
341.65	1,000	10.0	200	1,000
341.66	1,000	10.0	1	1,001
342.15	1,624	100.0	643	1,644
342.65	2,884	100.0	1,127	2,771
343.15	2,926	100.0	1,453	4,223

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.15'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	342.15'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.65'	**2.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.65'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.79 cfs @ 18.23 hrs HW=340.10' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.48 cfs @ 7.40 fps)
- **3=Orifice** (Orifice Controls 0.12 cfs @ 5.63 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.91 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.65' (Free Discharge)

DMA 22 & 23 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

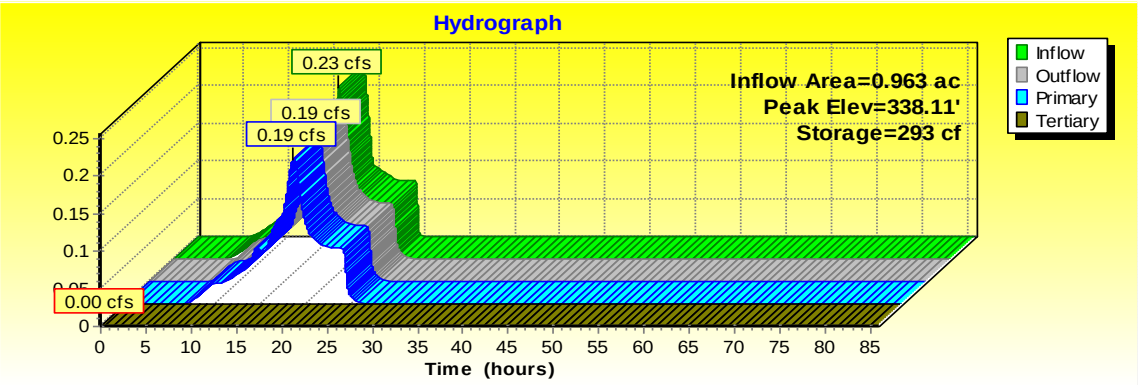
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

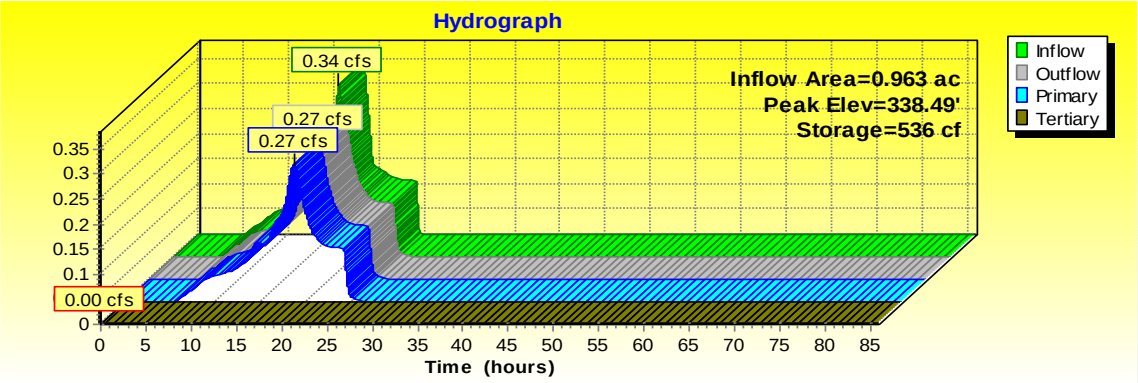
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

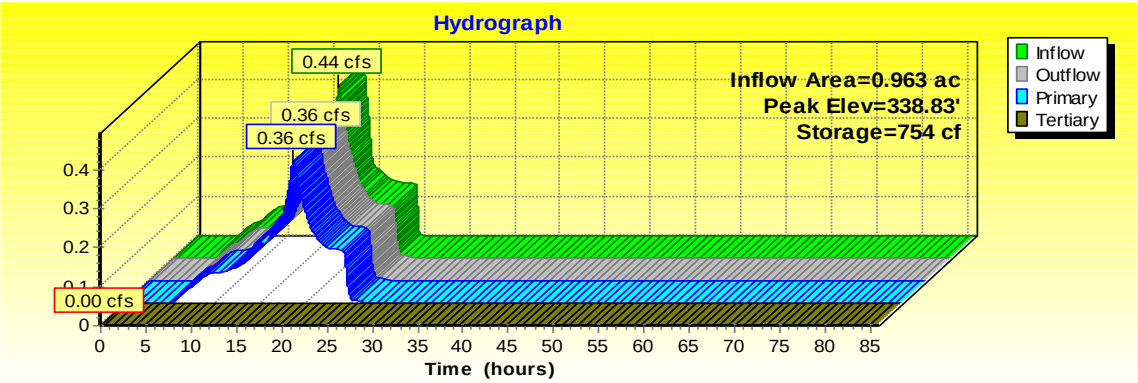
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

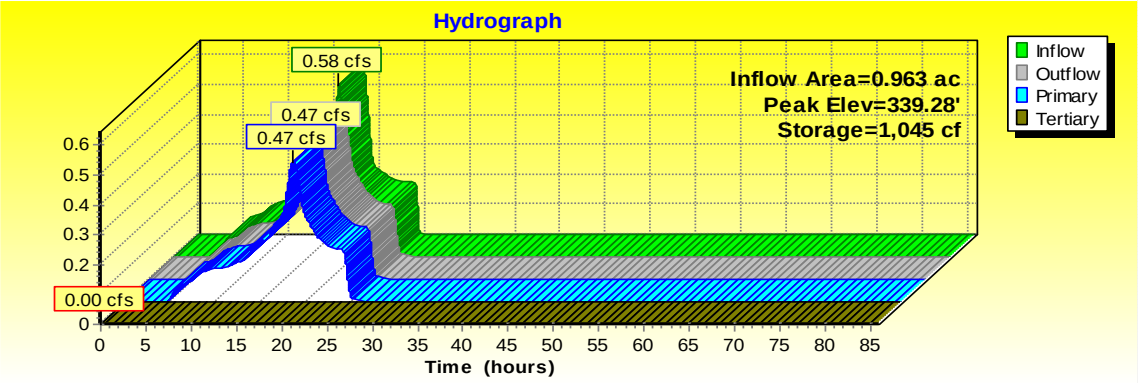
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

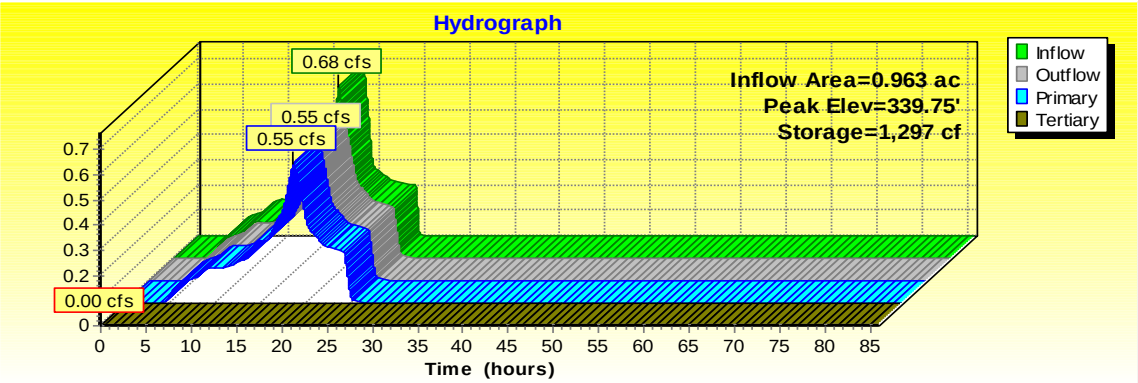
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

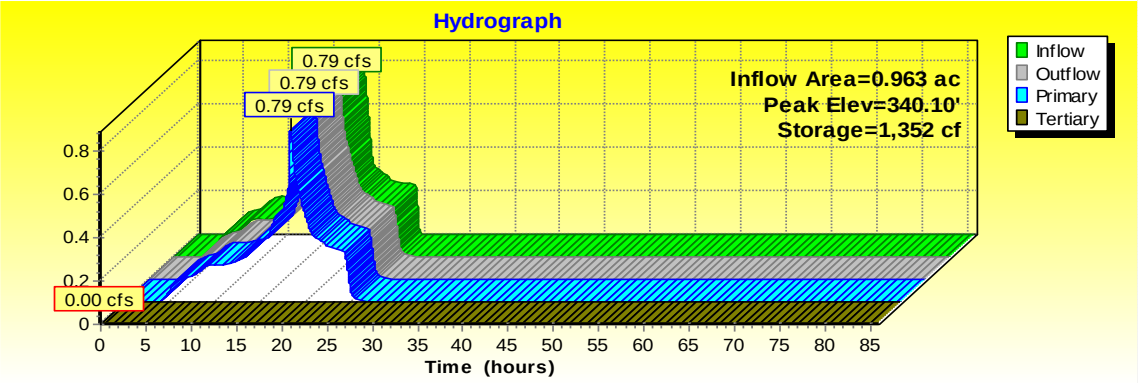
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

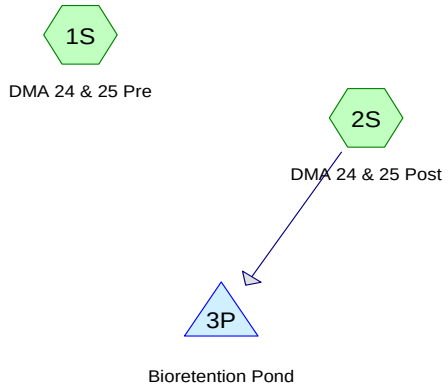
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 Event Summary



Events for Subcatchment 1S: DMA 24 & 25 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.038	0.47
2 year	2.90	0.21	0.094	1.18
5 year	3.84	0.33	0.152	1.91
10 year	4.62	0.42	0.204	2.56
25 year	5.72	0.56	0.281	3.53
50 year	6.59	0.67	0.344	4.32
100 year	**7.49**	**0.78**	**0.410**	**5.15**

Events for Subcatchment 2S: DMA 24 & 25 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.035	0.44
2 year	2.90	0.20	0.089	1.12
5 year	3.84	0.31	0.146	1.83
10 year	4.62	0.41	0.197	2.48
25 year	5.72	0.54	0.273	3.43
50 year	6.59	0.65	0.335	4.21
100 year	**7.49**	**0.76**	**0.401**	**5.03**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	336.46	102
2 year	0.20	0.16	0.16	0.00	336.92	309
5 year	0.31	0.23	0.23	0.00	337.56	603
10 year	0.41	0.29	0.29	0.00	338.24	911
25 year	0.54	0.35	0.35	0.00	339.03	1,479
50 year	0.65	0.38	0.38	0.00	339.65	2,031
100 year	**0.76**	**0.59**	**0.59**	0.00	**340.10**	**2,481**

DMA 24 & 25 Pre-Development

Summary for Subcatchment 1S: DMA 24 & 25 Pre

Runoff = 0.78 cfs @ 18.14 hrs, Volume= 0.410 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
41,600	80	>75% Grass cover, Good, HSG D
41,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 24 & 25 Post-Development

Summary for Subcatchment 2S: DMA 24 & 25 Post

Runoff = 0.76 cfs @ 18.21 hrs, Volume= 0.401 af, Depth= 5.03"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
8,309	98	Roofs, HSG C
33,291	74	>75% Grass cover, Good, HSG C
41,600	79	Weighted Average
33,291		80.03% Pervious Area
8,309		19.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 24 & 25 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.955 ac, 19.97% Impervious, Inflow Depth = 5.03" for 100 year event
Inflow = 0.76 cfs @ 18.21 hrs, Volume= 0.401 af
Outflow = 0.59 cfs @ 18.65 hrs, Volume= 0.401 af, Atten= 22%, Lag= 26.6 min
Primary = 0.59 cfs @ 18.65 hrs, Volume= 0.401 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.10' @ 18.65 hrs Surf.Area= 560 sf Storage= 2,481 cf

Plug-Flow detention time= 58.1 min calculated for 0.401 af (100% of inflow)
Center-of-Mass det. time= 57.9 min (1,036.7 - 978.8)

Volume	Invert	Avail.Storage	Storage Description
#1	336.24'	3,188 cf	**DMA 24 bio-swale (Prismatic)** Listed below (Recalc)
#2	336.24'	4,756 cf	**DMA 25 Bio-swale (Prismatic)** Listed below (Recalc) -Impervious
		7,944 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.24	560	0.0	0	0
336.25	560	40.0	2	2
338.24	560	40.0	446	448
338.25	560	10.0	1	449
340.24	560	10.0	111	560
340.25	560	10.0	1	561
341.74	1,001	100.0	1,163	1,724
342.24	1,460	100.0	615	2,339
342.74	1,937	100.0	849	3,188

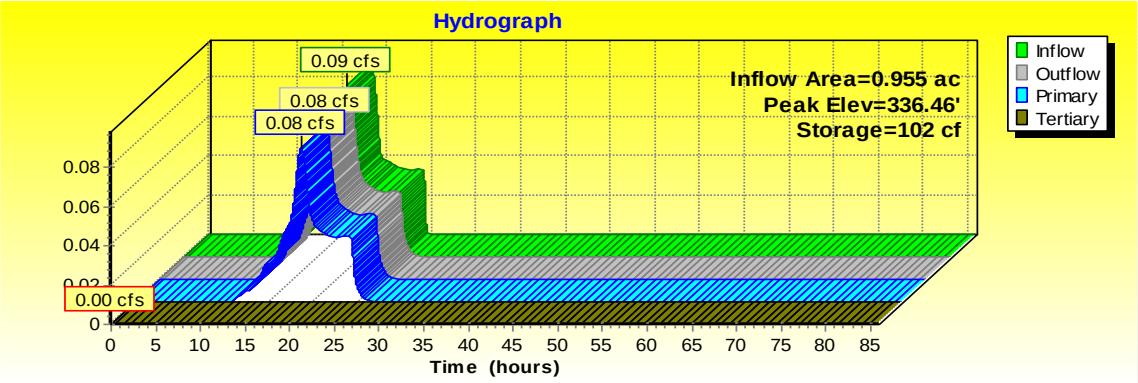
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.24	580	0.0	0	0
336.25	580	40.0	2	2
338.24	580	40.0	462	464
338.25	580	40.0	2	466
340.24	1,036	100.0	1,608	2,074
340.74	1,510	100.0	637	2,711
341.24	2,002	100.0	878	3,589
341.74	2,669	100.0	1,168	4,756

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.74'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.74'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.24'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.59 cfs @ 18.65 hrs HW=340.10' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.41 cfs @ 9.35 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.91 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.24' (Free Discharge)

DMA 24 & 25 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

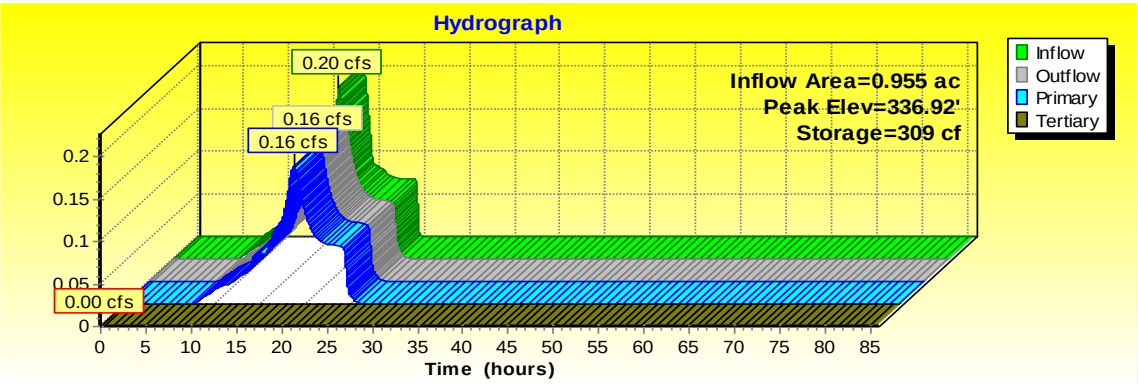
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

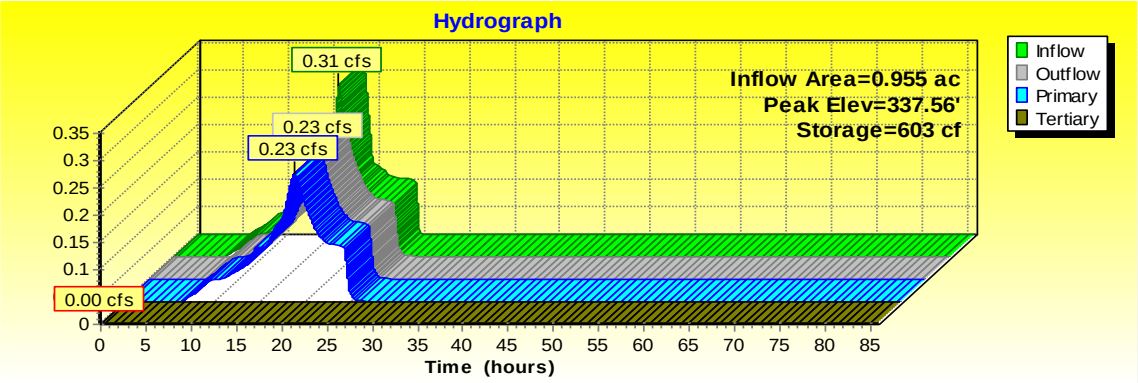
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

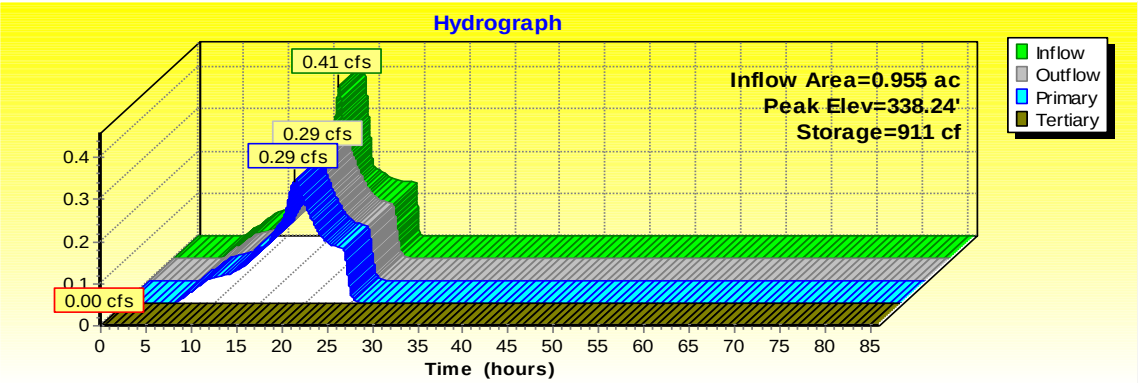
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

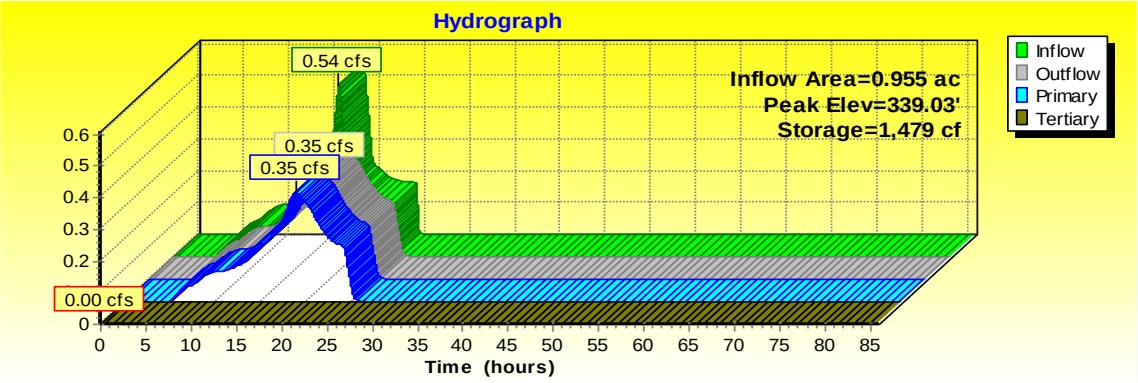
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

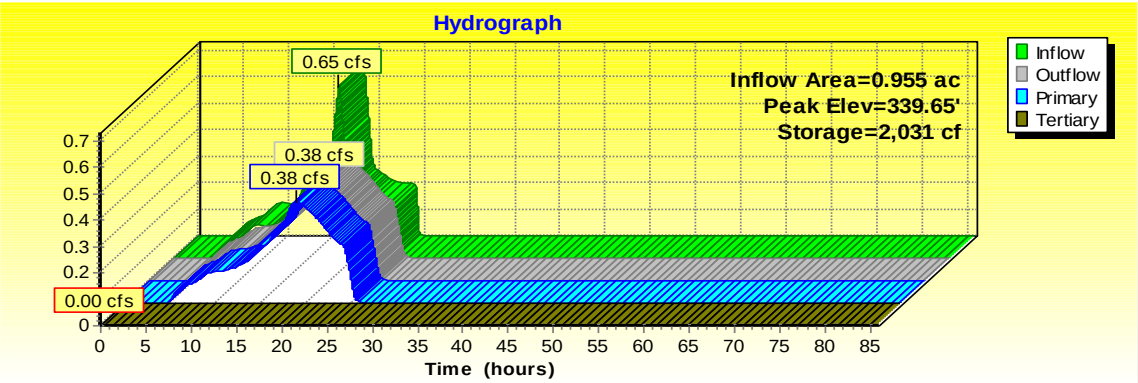
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

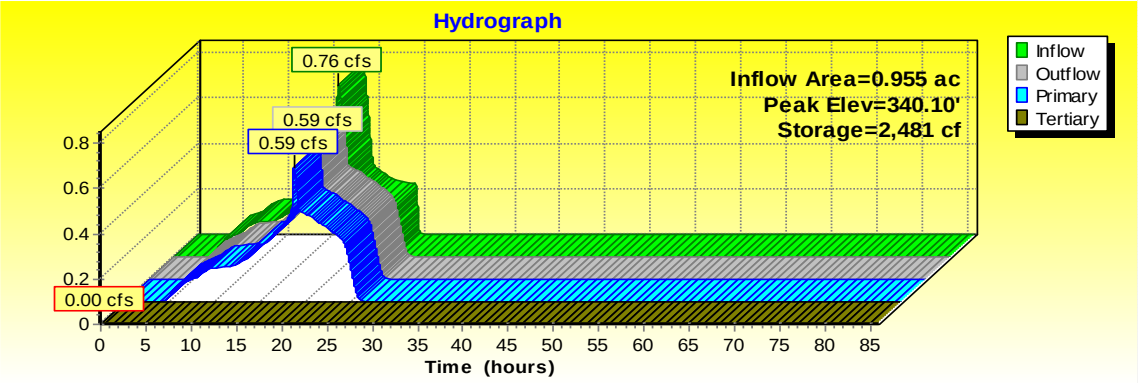
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

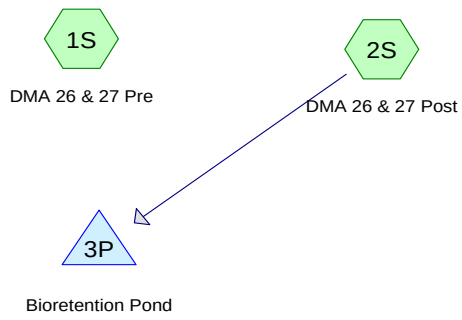
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 Event Summary



Events for Subcatchment 1S: DMA 26 & 27 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.039	0.47
2 year	2.90	0.22	0.098	1.18
5 year	3.84	0.34	0.159	1.91
10 year	4.62	0.44	0.213	2.56
25 year	5.72	0.59	0.294	3.53
50 year	6.59	0.70	0.359	4.32
100 year	**7.49**	**0.82**	**0.428**	**5.15**

Events for Subcatchment 2S: DMA 26 & 27 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.039	0.47
2 year	2.90	0.22	0.098	1.18
5 year	3.84	0.34	0.159	1.91
10 year	4.62	0.44	0.213	2.56
25 year	5.72	0.58	0.294	3.53
50 year	6.59	0.69	0.359	4.32
100 year	**7.49**	**0.80**	**0.428**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.10	0.08	0.08	**0.00**	337.49	136
2 year	0.22	0.17	0.17	0.00	337.97	400
5 year	0.34	0.24	0.24	0.00	338.62	764
10 year	0.44	0.33	0.33	0.00	339.36	1,121
25 year	0.58	0.57	0.57	0.00	340.03	1,221
50 year	0.69	0.69	0.69	0.00	340.08	1,230
100 year	**0.80**	**0.80**	**0.80**	0.00	**340.12**	**1,236**

DMA 26 & 27 Pre-Development

Summary for Subcatchment 1S: DMA 26 & 27 Pre

Runoff = 0.82 cfs @ 18.14 hrs, Volume= 0.428 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
43,472	80	>75% Grass cover, Good, HSG D
43,472		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 26 & 27 Post-Development

Summary for Subcatchment 2S: DMA 26 & 27 Post

Runoff = 0.80 cfs @ 18.21 hrs, Volume= 0.428 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
11,470	98	Roofs, HSG C
32,002	74	>75% Grass cover, Good, HSG C
43,472	80	Weighted Average
32,002		73.62% Pervious Area
11,470		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 26 & 27 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.998 ac, 26.38% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.80 cfs @ 18.21 hrs, Volume= 0.428 af
Outflow = 0.80 cfs @ 18.22 hrs, Volume= 0.428 af, Atten= 0%, Lag= 0.4 min
Primary = 0.80 cfs @ 18.22 hrs, Volume= 0.428 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.12' @ 18.22 hrs Surf.Area= 1,625 sf Storage= 1,236 cf

Plug-Flow detention time= 45.7 min calculated for 0.428 af (100% of inflow)
Center-of-Mass det. time= 45.5 min (1,019.2 - 973.7)

Volume	Invert	Avail.Storage	Storage Description
#1	337.24'	4,044 cf	**DMA 26 Bio-swale (Prismatic)** Listed below (Recalc)
#2	337.24'	3,643 cf	**DMA 27 Bio-swale (Prismatic)** Listed below (Recalc)
		7,687 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.24	720	0.0	0	0
337.25	720	40.0	3	3
339.24	720	40.0	573	576
339.25	720	10.0	1	577
341.24	1,281	10.0	199	776
341.75	1,860	100.0	801	1,577
342.24	2,457	100.0	1,058	2,634
342.75	3,072	100.0	1,410	4,044

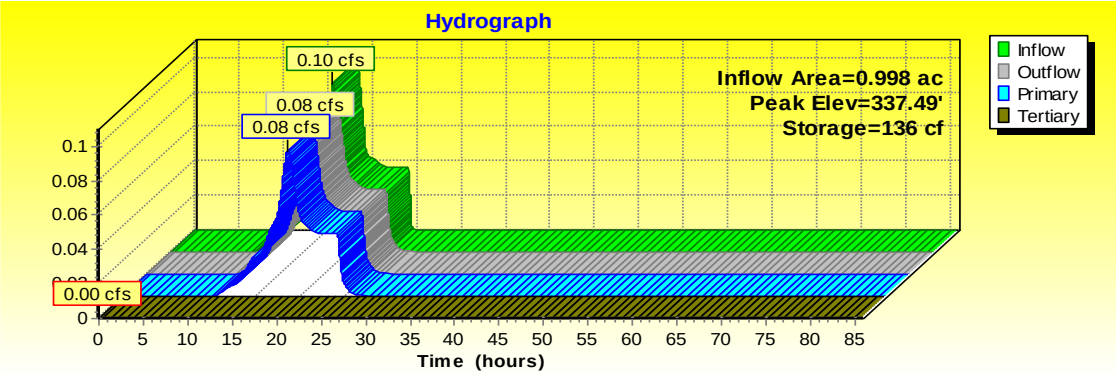
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.24	660	0.0	0	0
337.25	660	40.0	3	3
339.24	660	40.0	525	528
339.25	660	10.0	1	529
341.24	660	10.0	131	660
341.25	1,176	100.0	9	669
341.74	1,710	100.0	707	1,376
342.24	2,262	100.0	993	2,369
342.74	2,832	100.0	1,274	3,643

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.75'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.74'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.24'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	339.24'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.80 cfs @ 18.22 hrs HW=340.12' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.35 cfs @ 8.05 fps)
- **3=Orifice** (Orifice Controls 0.21 cfs @ 4.18 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.24 cfs @ 1.01 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.24' (Free Discharge)

DMA 26 & 27 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

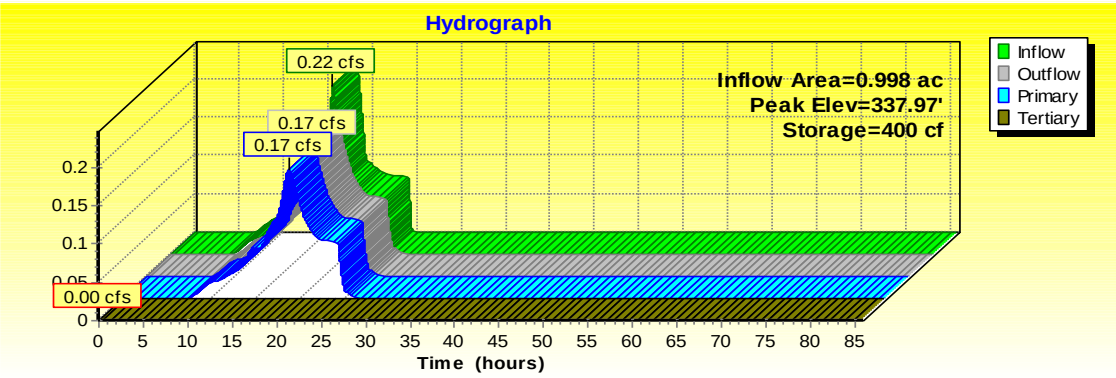
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

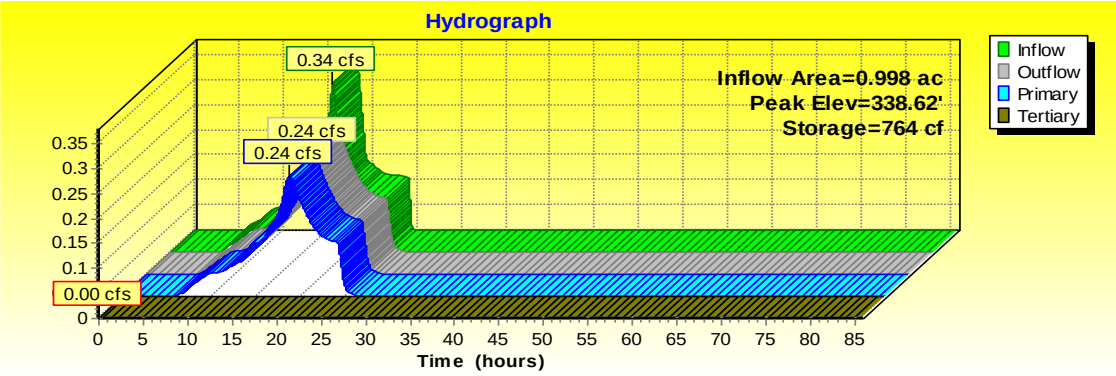
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

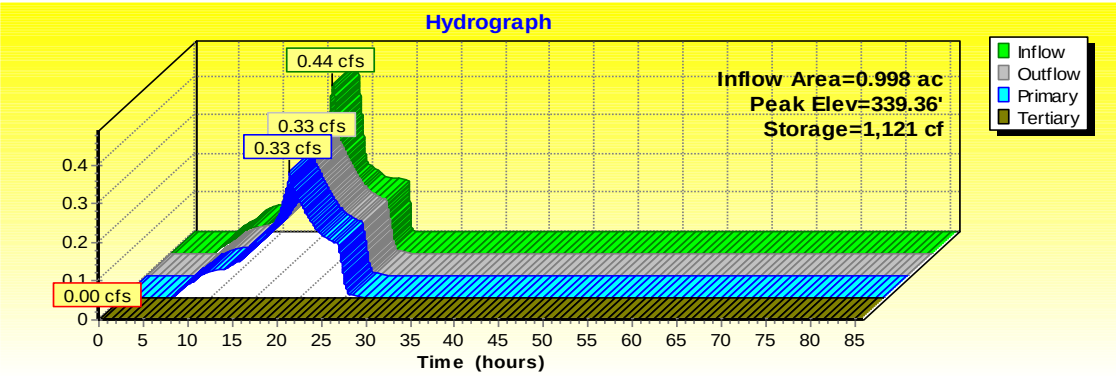
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

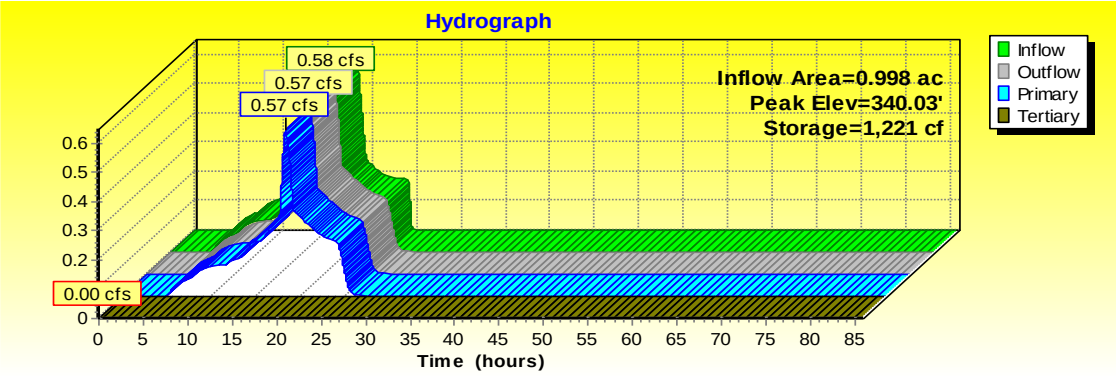
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

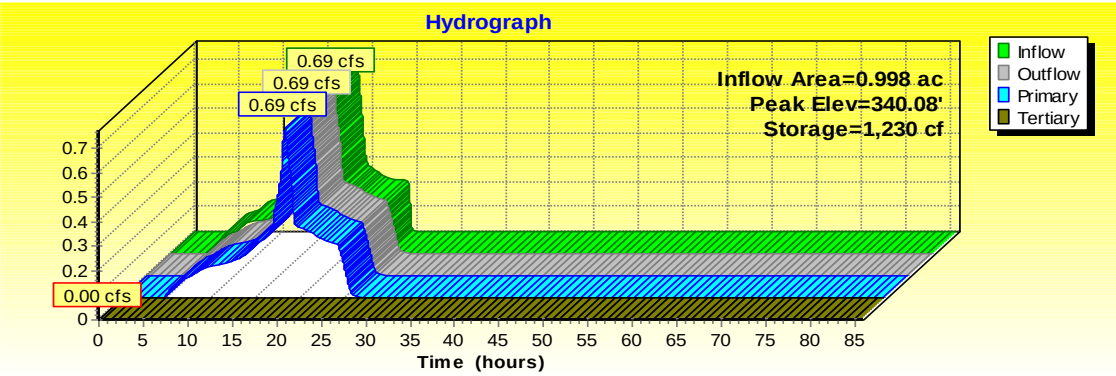
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

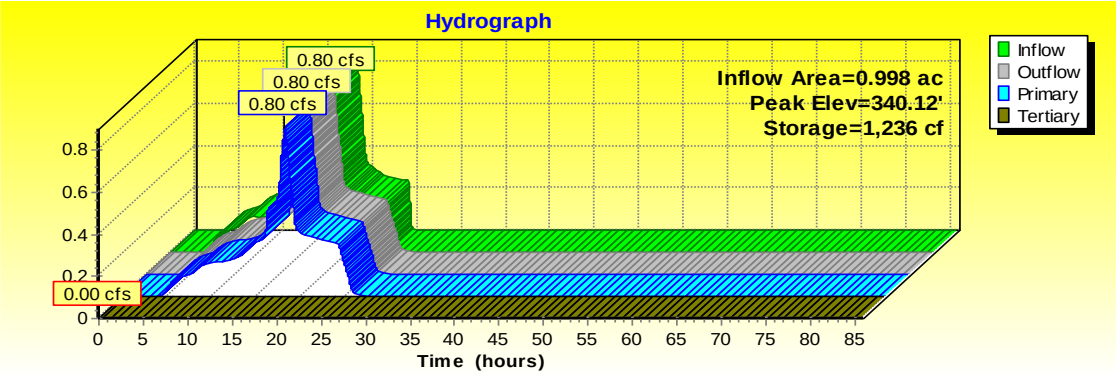
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

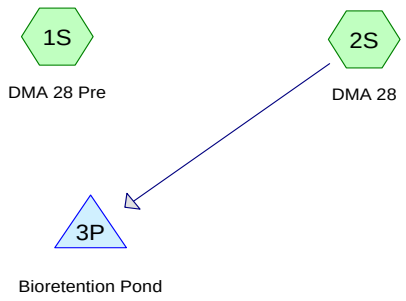
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 Event Summary



Events for Subcatchment 1S: DMA 28 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.043	0.47
1 year	2.21	0.15	0.062	0.69
2 year	2.90	0.24	0.106	1.18
5 year	3.84	0.37	0.172	1.91
10 year	4.62	0.48	0.230	2.56
25 year	5.72	0.63	0.317	3.53
50 year	6.59	0.76	0.388	4.32
100 year	**7.49**	**0.88**	**0.462**	**5.15**

Events for Subcatchment 2S: DMA 28

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.18	0.081	0.90
1 year	2.21	0.23	0.108	1.20
2 year	2.90	0.32	0.163	1.81
5 year	3.84	0.46	0.240	2.67
10 year	4.62	0.56	0.306	3.41
25 year	5.72	0.72	0.401	4.46
50 year	6.59	0.84	0.477	5.31
100 year	**7.49**	**0.96**	**0.556**	**6.19**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.18	0.09	0.09	**0.00**	336.51	885
1 year	0.23	0.14	0.14	0.00	336.73	1,143
2 year	0.32	0.20	0.20	0.00	337.15	1,623
5 year	0.46	0.27	0.27	0.00	337.91	2,331
10 year	0.56	0.39	0.39	0.00	339.57	2,804
25 year	0.72	0.41	0.41	0.00	340.00	3,644
50 year	0.84	0.63	0.63	0.00	340.11	4,037
100 year	**0.96**	**0.85**	**0.85**	0.00	**340.17**	**4,264**

DMA 28 Pre-Development

Summary for Subcatchment 1S: DMA 28 Pre

Runoff = 0.88 cfs @ 18.14 hrs, Volume= 0.462 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
46,939	80	>75% Grass cover, Good, HSG D
46,939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 28 Post-Development

Summary for Subcatchment 2S: DMA 28

Runoff = 0.96 cfs @ 18.14 hrs, Volume= 0.556 af, Depth= 6.19"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
29,159	98	Roofs, HSG C
17,780	74	>75% Grass cover, Good, HSG C
46,939	89	Weighted Average
17,780		37.88% Pervious Area
29,159		62.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 28 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.078 ac, 62.12% Impervious, Inflow Depth = 6.19" for 100 year event
Inflow = 0.96 cfs @ 18.14 hrs, Volume= 0.556 af
Outflow = 0.85 cfs @ 18.39 hrs, Volume= 0.556 af, Atten= 12%, Lag= 14.8 min
Primary = 0.85 cfs @ 18.39 hrs, Volume= 0.556 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.17' @ 18.39 hrs Surf.Area= 3,643 sf Storage= 4,264 cf

Plug-Flow detention time= 129.1 min calculated for 0.555 af (100% of inflow)
Center-of-Mass det. time= 129.4 min (1,048.0 - 918.7)

Volume	Invert	Avail.Storage	Storage Description
#1	335.73'	12,159 cf	**DMA 28 Bio-swale (Prismatic)** Listed below (Recalc)

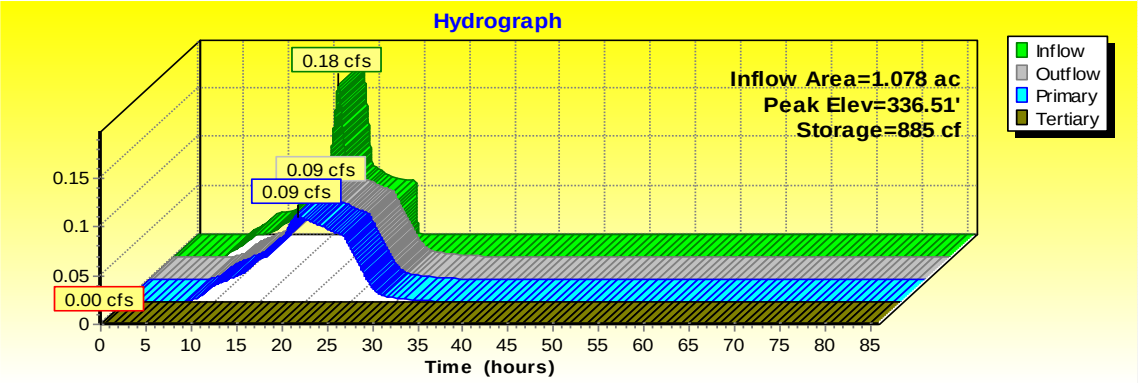
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
335.73	2,850	0.0	0	0
335.74	2,850	40.0	11	11
337.73	2,850	40.0	2,269	2,280
337.74	2,850	10.0	3	2,283
339.73	2,850	10.0	567	2,850
339.74	2,850	10.0	3	2,853
340.23	3,744	100.0	1,616	4,468
340.73	4,656	100.0	2,100	6,568
341.23	5,586	100.0	2,561	9,129
341.73	6,534	100.0	3,030	12,159

Device	Routing	Invert	Outlet Devices
#0	Tertiary	341.73'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	335.73'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.50'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	340.23'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.85 cfs @ 18.39 hrs HW=340.17' (Free Discharge)
- **1=Orifice** (Orifice Controls 0.22 cfs @ 10.06 fps)
- **2=Orifice** (Orifice Controls 0.20 cfs @ 9.12 fps)
- **3=Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.43 cfs @ 1.22 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=335.73' (Free Discharge)

DMA 28 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

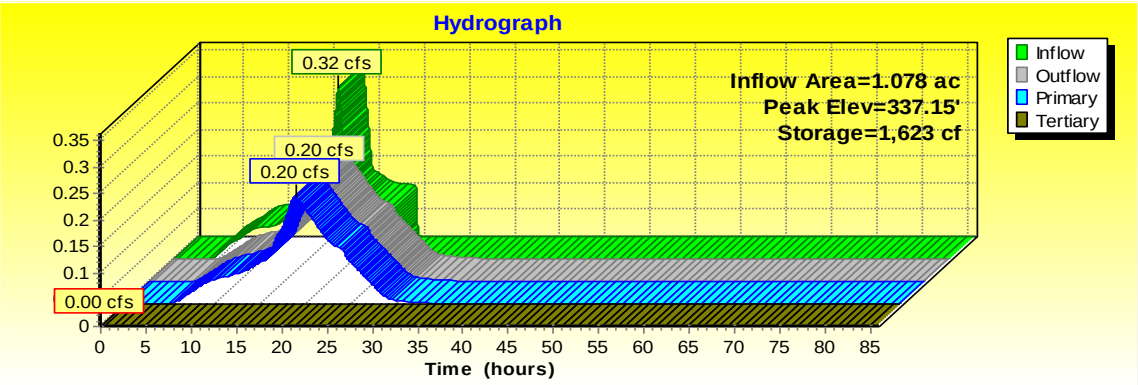
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

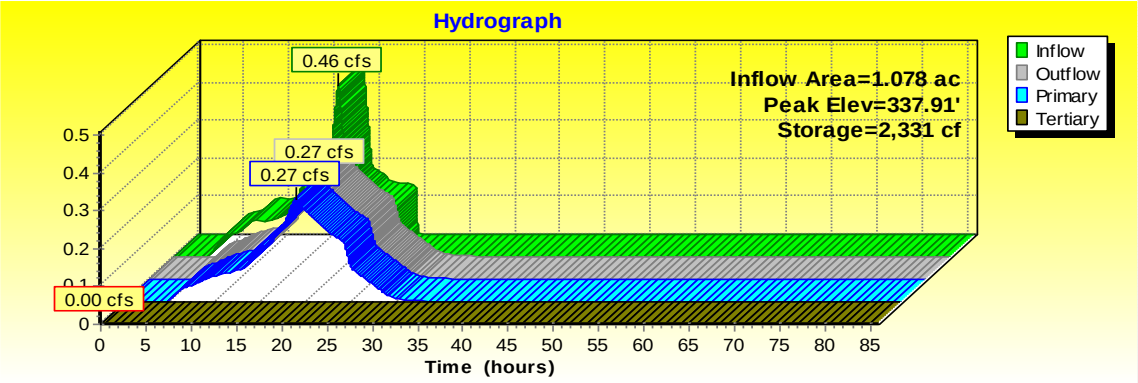
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

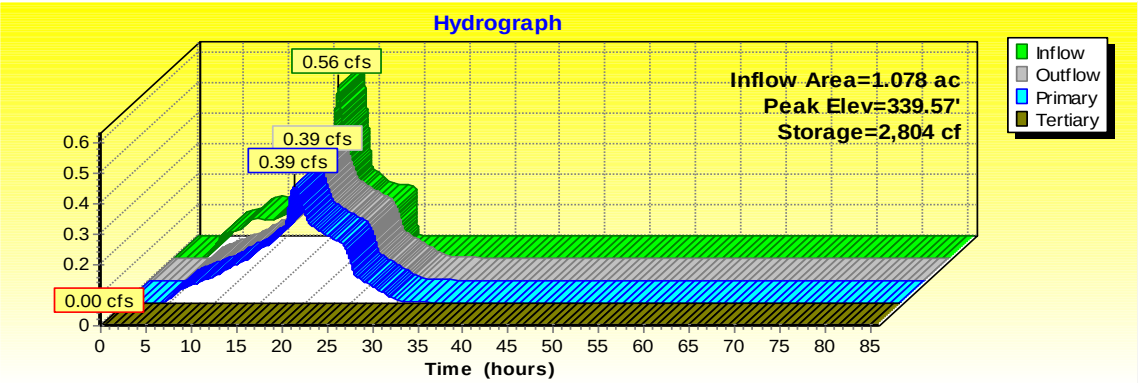
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

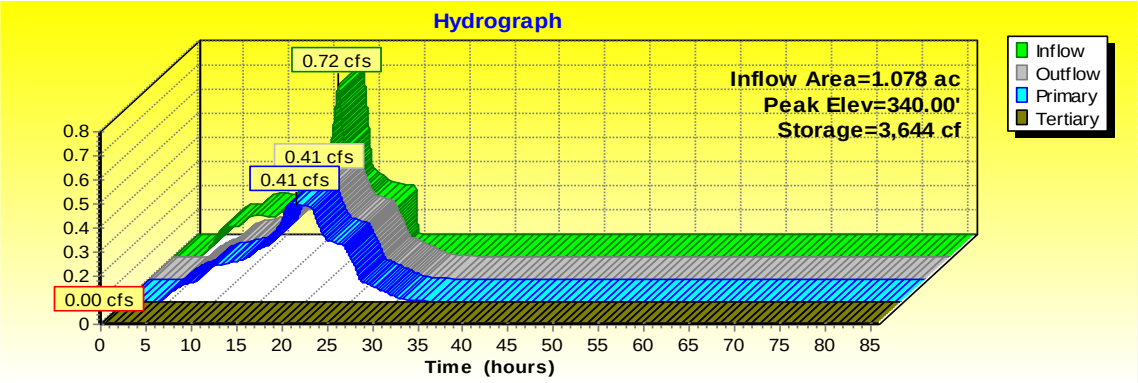
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

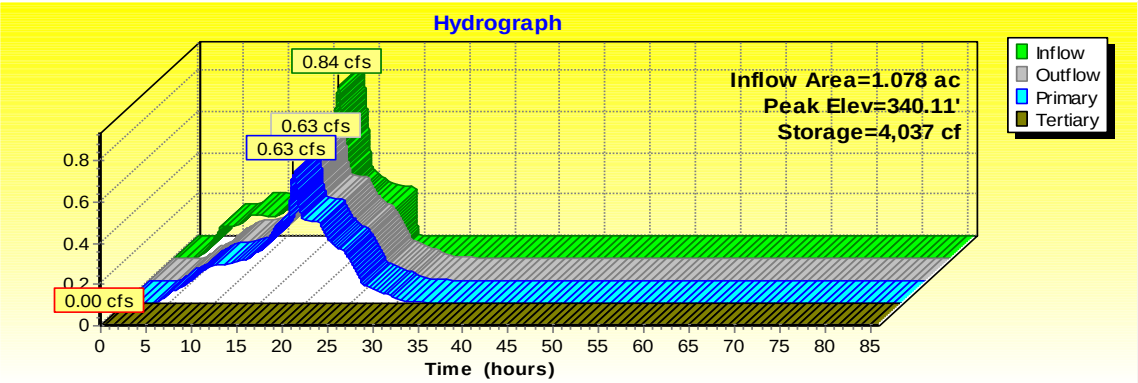
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

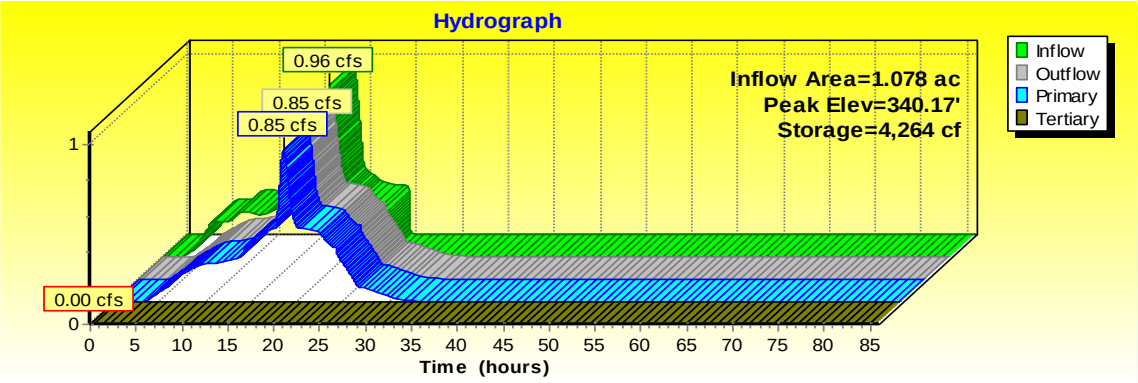
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

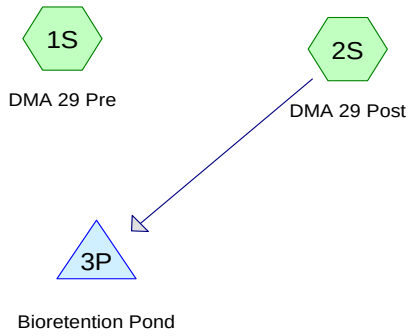
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 Event Summary



Events for Subcatchment 1S: DMA 29 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.03	0.011	0.47
2 year	2.90	0.06	0.026	1.18
5 year	3.84	0.09	0.043	1.91
10 year	4.62	0.12	0.057	2.56
25 year	5.72	0.15	0.079	3.53
50 year	6.59	0.18	0.096	4.32
100 year	**7.49**	**0.21**	**0.115**	**5.15**

Events for Subcatchment 2S: DMA 29 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.019	0.85
2 year	2.90	0.08	0.039	1.73
5 year	3.84	0.11	0.058	2.58
10 year	4.62	0.13	0.074	3.31
25 year	5.72	0.17	0.097	4.36
50 year	6.59	0.20	0.116	5.20
100 year	**7.49**	**0.23**	**0.136**	**6.07**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.04	0.03	0.03	**0.00**	337.06	111
2 year	0.08	0.05	0.05	0.00	337.54	274
5 year	0.11	0.08	0.08	0.00	337.84	377
10 year	0.13	0.10	0.10	0.00	338.09	463
25 year	0.17	0.12	0.12	0.00	338.50	600
50 year	0.20	0.15	0.15	0.00	339.10	714
100 year	**0.23**	**0.20**	**0.20**	0.00	**340.03**	**793**

DMA 29 Pre-Development

Summary for Subcatchment 1S: DMA 29 Pre

Runoff = 0.21 cfs @ 18.27 hrs, Volume= 0.115 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
11,674	80	>75% Grass cover, Good, HSG D
11,674		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 29 Post-Development

Summary for Subcatchment 2S: DMA 29 Post

Runoff = 0.23 cfs @ 18.27 hrs, Volume= 0.136 af, Depth= 6.07"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	7,045	98	Roofs
*	4,629	74	>75% Grass cover, Good, HSG C
	11,674	88	Weighted Average
	4,629		39.65% Pervious Area
	7,045		60.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 29 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.268 ac, 60.35% Impervious, Inflow Depth = 6.07" for 100 year event
Inflow = 0.23 cfs @ 18.27 hrs, Volume= 0.136 af
Outflow = 0.20 cfs @ 18.62 hrs, Volume= 0.136 af, Atten= 13%, Lag= 21.3 min
Primary = 0.20 cfs @ 18.62 hrs, Volume= 0.136 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.03' @ 18.64 hrs Surf.Area= 850 sf Storage= 793 cf

Plug-Flow detention time= 80.7 min calculated for 0.136 af (100% of inflow)
Center-of-Mass det. time= 78.9 min (1,012.9 - 934.0)

Volume	Invert	Avail.Storage	Storage Description
#1	336.73'	4,249 cf	**DMA 29 Bioswale (Prismatic)** Listed below (Recalc)

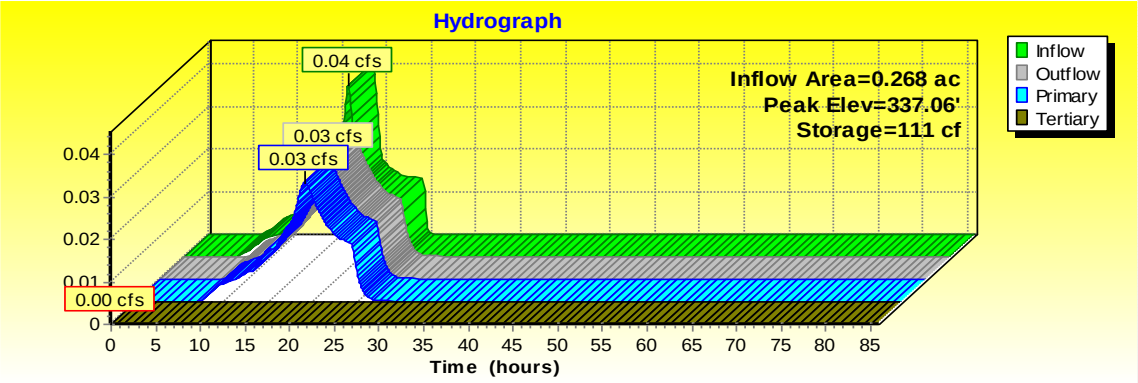
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.73	850	0.0	0	0
336.74	850	40.0	3	3
338.73	850	40.0	677	680
338.74	850	40.0	3	683
340.73	850	10.0	169	853
340.74	850	10.0	1	853
341.23	1,384	10.0	55	908
341.73	1,936	100.0	830	1,738
342.23	2,506	100.0	1,111	2,849
342.73	3,094	100.0	1,400	4,249

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.73'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.23'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.73'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.50'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.19 cfs @ 18.62 hrs HW=340.02' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.09 cfs @ 8.68 fps)
- **3=Orifice** (Orifice Controls 0.08 cfs @ 7.58 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.40 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.73' (Free Discharge)

DMA 29 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

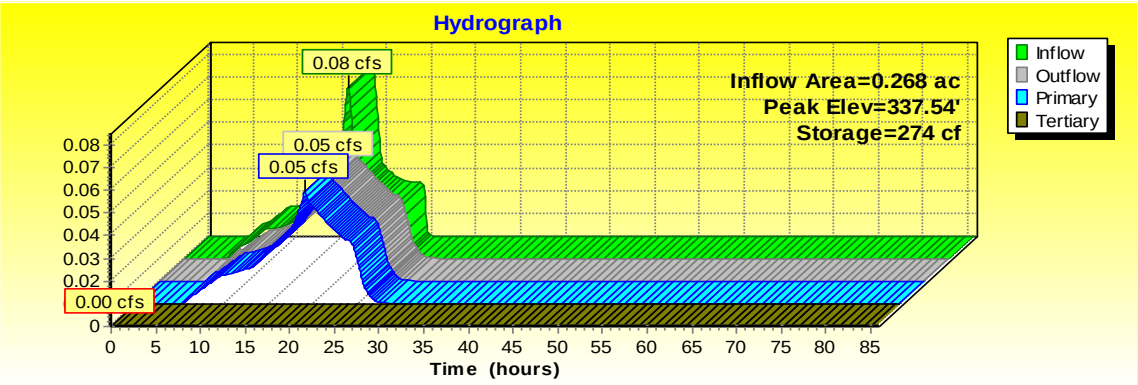
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 2-year Event



Elevation = water surface elevation

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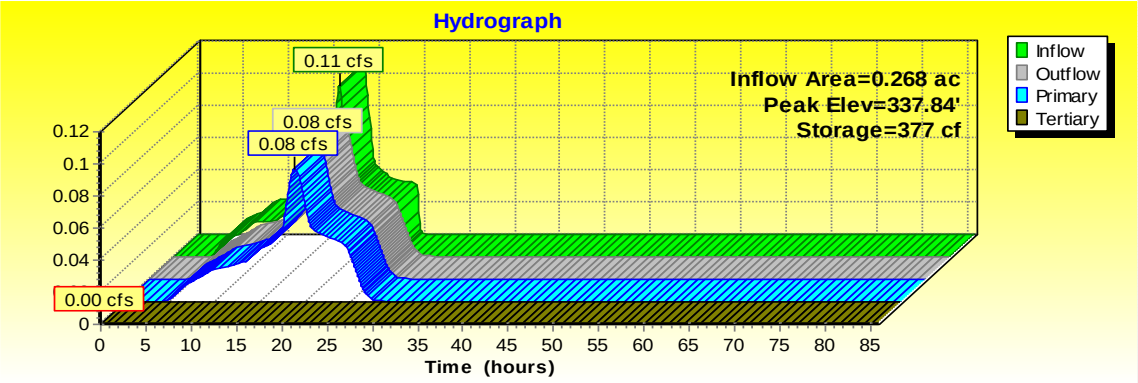
DMA 29 5-year Event



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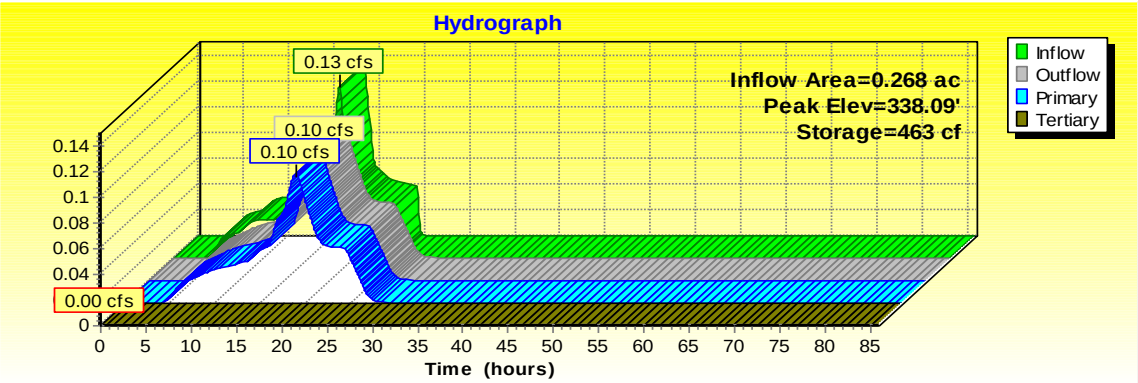
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 10-year Event



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Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

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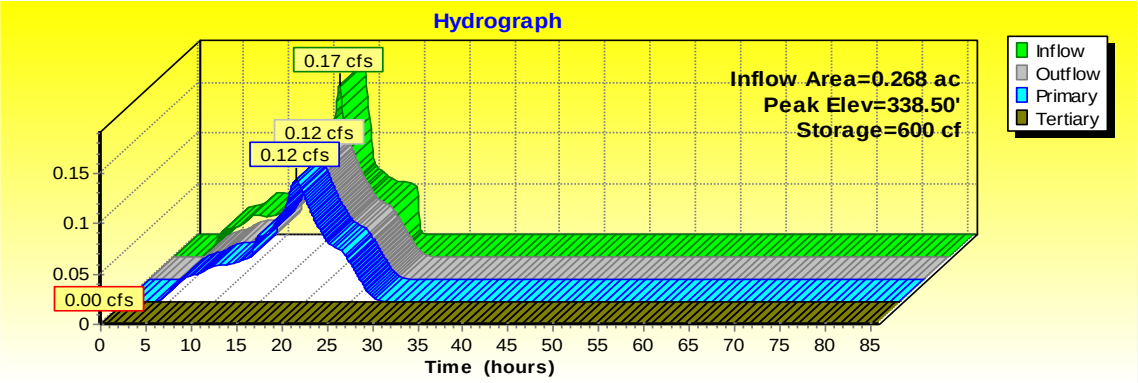
DMA 29 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

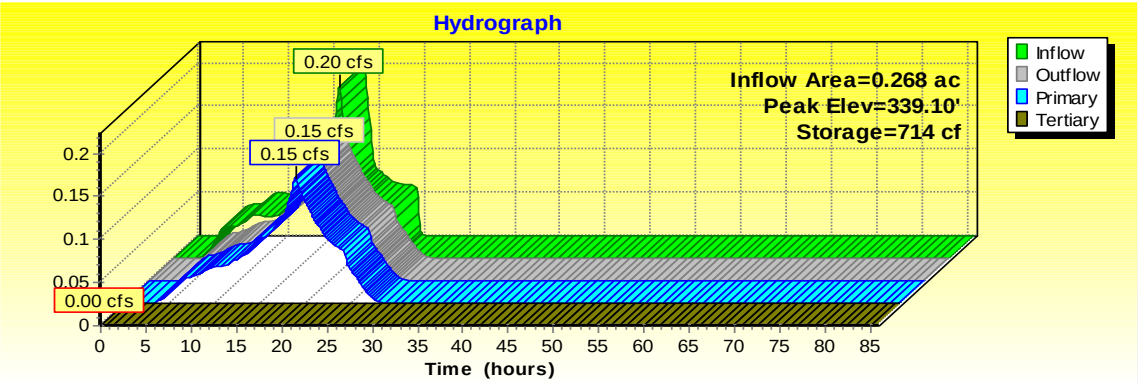
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

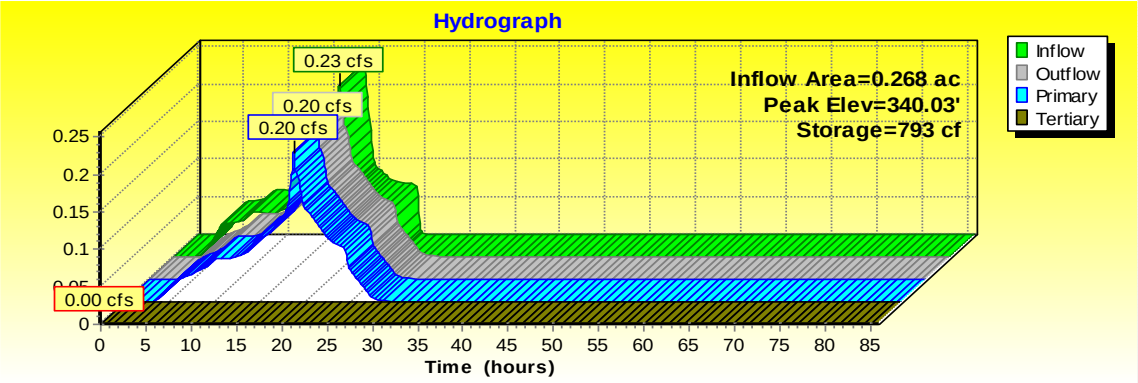
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

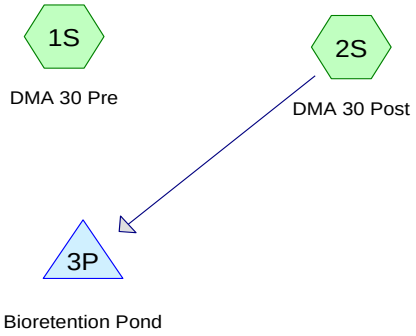
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 Event Summary



Events for Subcatchment 1S: DMA 30 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.03	0.012	0.47
2 year	2.90	0.06	0.029	1.18
5 year	3.84	0.10	0.047	1.91
10 year	4.62	0.13	0.063	2.56
25 year	5.72	0.17	0.087	3.53
50 year	6.59	0.20	0.106	4.32
100 year	**7.49**	**0.23**	**0.127**	**5.15**

Events for Subcatchment 2S: DMA 30 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.021	0.85
2 year	2.90	0.08	0.043	1.73
5 year	3.84	0.12	0.064	2.58
10 year	4.62	0.15	0.081	3.31
25 year	5.72	0.19	0.107	4.36
50 year	6.59	0.22	0.128	5.20
100 year	**7.49**	**0.25**	**0.149**	**6.07**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.05	0.03	0.03	**0.00**	336.97	98
2 year	0.09	0.06	0.06	0.00	337.32	231
5 year	0.12	0.10	0.10	0.00	337.63	351
10 year	0.15	0.12	0.12	0.00	337.82	423
25 year	0.19	0.15	0.15	0.00	338.10	527
50 year	0.23	0.17	0.17	0.00	338.34	621
100 year	**0.26**	**0.19**	**0.19**	0.00	**338.63**	**728**

DMA 30 Pre-Development

Summary for Subcatchment 1S: DMA 30 Pre

Runoff = 0.23 cfs @ 18.27 hrs, Volume= 0.127 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
12,866	80	>75% Grass cover, Good, HSG D
12,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 30 Post-Development

Summary for Subcatchment 2S: DMA 30 Post

Runoff = 0.25 cfs @ 18.27 hrs, Volume= 0.149 af, Depth= 6.07"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	7,600	98	Roofs
*	5,266	74	>75% Grass cover, Good, HSG C
	12,866	88	Weighted Average
	5,266		40.93% Pervious Area
	7,600		59.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 30 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.295 ac, 59.07% Impervious, Inflow Depth = 6.07" for 100 year event
Inflow = 0.26 cfs @ 18.13 hrs, Volume= 0.149 af
Outflow = 0.19 cfs @ 18.64 hrs, Volume= 0.149 af, Atten= 27%, Lag= 30.4 min
Primary = 0.19 cfs @ 18.64 hrs, Volume= 0.149 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 338.63' @ 18.64 hrs Surf.Area= 950 sf Storage= 728 cf

Plug-Flow detention time= 62.2 min calculated for 0.149 af (100% of inflow)
Center-of-Mass det. time= 61.0 min (985.7 - 924.8)

Volume	Invert	Avail.Storage	Storage Description
#1	336.71'	4,213 cf	**DMA 29 Bioswale (Prismatic)** Listed below (Recalc)

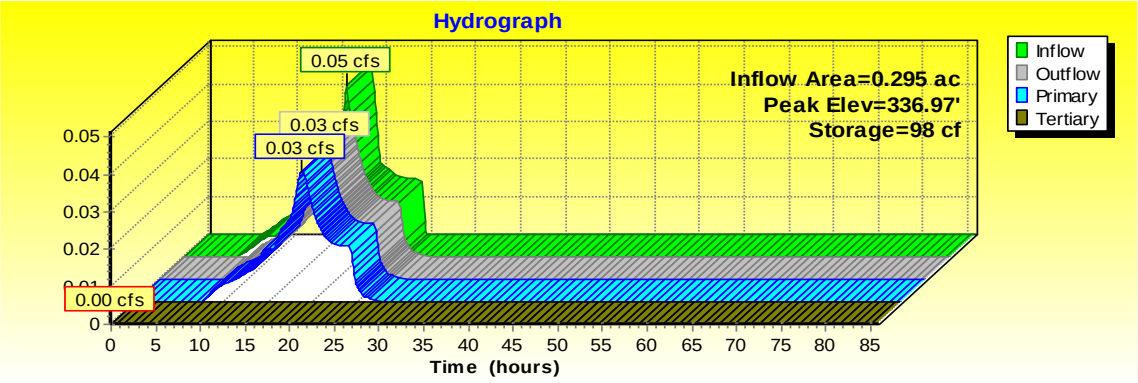
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.71	950	0.0	0	0
336.72	950	40.0	4	4
338.71	950	40.0	756	760
338.72	950	40.0	4	764
340.71	950	10.0	189	953
340.72	950	10.0	1	954
341.22	1,274	100.0	556	1,510
341.72	1,616	100.0	723	2,232
342.22	1,976	100.0	898	3,130
342.72	2,354	100.0	1,083	4,213

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.72'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.21'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.73'	**1.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.50'	**1.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.19 cfs @ 18.64 hrs HW=338.62' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.11 cfs @ 6.55 fps)
- **3=Orifice** (Orifice Controls 0.08 cfs @ 5.01 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.71' (Free Discharge)

DMA 30 95th% Event



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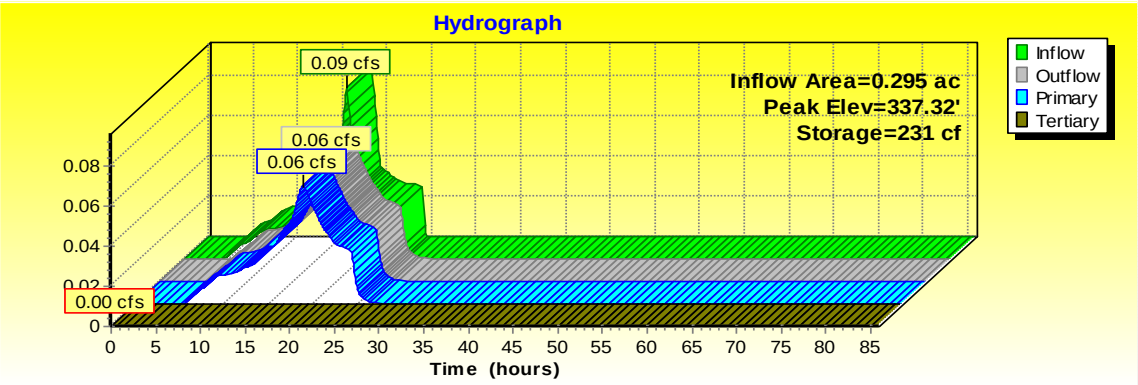
DMA 30 2-year Event



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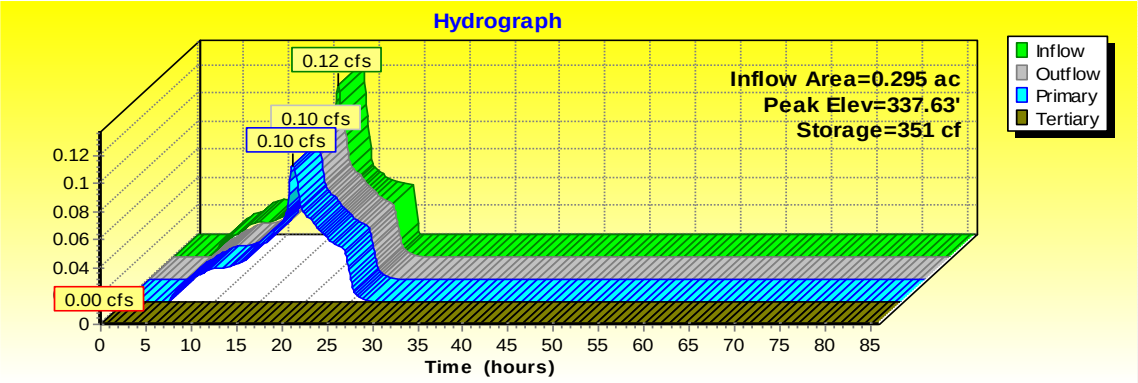
DMA 30 5-year Event



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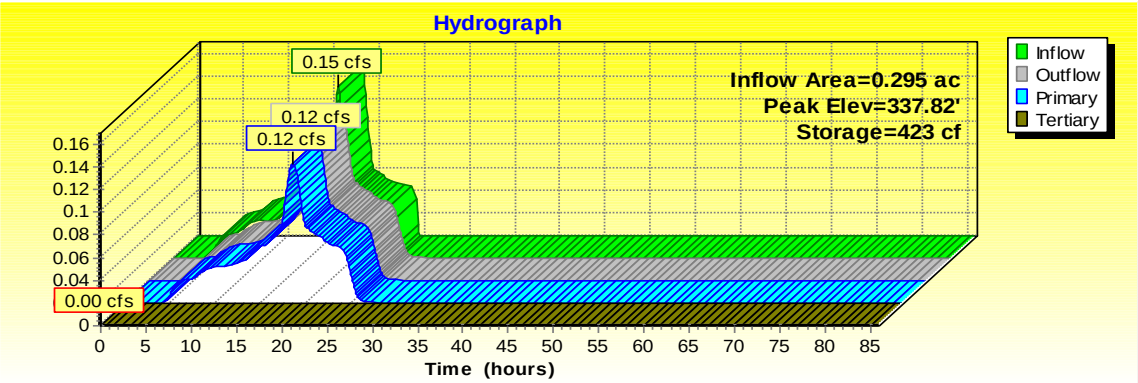
DMA 30 10-year Event



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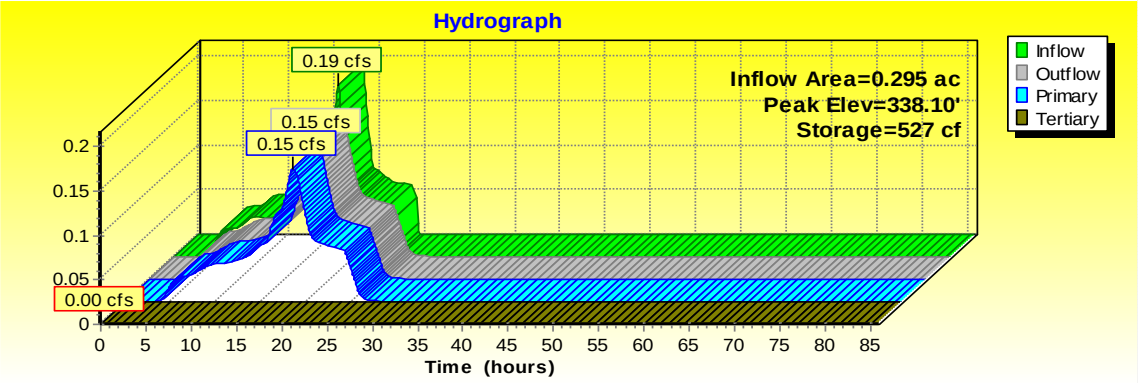

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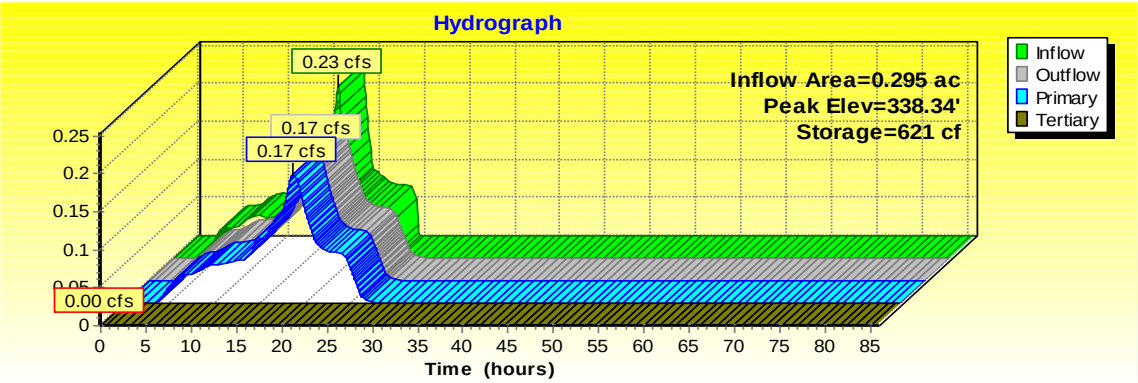

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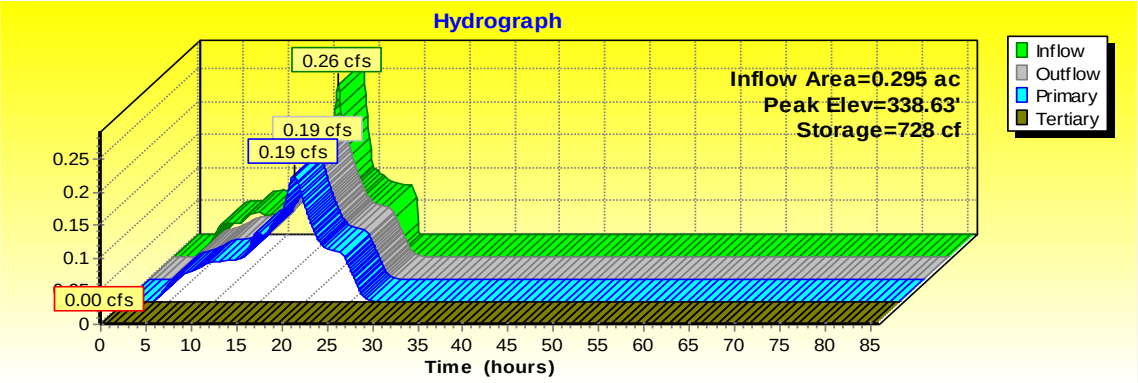

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MH engineering Co.
16075 Vineyard Blvd., Morgan Hill, CA 95037 - (408) 779-7381

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

DMA No. 1 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.83	0.00	0.00	**0.00**
2.00	0.00	0	335.83	0.00	0.00	0.00
4.00	0.00	0	335.83	0.00	0.00	0.00
6.00	0.00	0	335.83	0.00	0.00	0.00
8.00	0.01	18	335.85	0.00	0.00	0.00
10.00	0.02	52	335.88	0.01	0.01	0.00
12.00	0.02	75	335.91	0.02	0.02	0.00
14.00	0.04	120	335.96	0.03	0.03	0.00
16.00	0.06	195	336.03	0.04	0.04	0.00
18.00	**0.13**	**410**	**336.26**	**0.07**	**0.07**	0.00
20.00	**0.06**	**528**	**336.38**	**0.08**	**0.08**	0.00
22.00	0.05	399	336.25	0.06	0.06	0.00
24.00	0.05	312	336.16	0.06	0.06	0.00
26.00	0.00	71	335.90	0.02	0.02	0.00
28.00	0.00	16	335.85	0.00	0.00	0.00
30.00	0.00	9	335.84	0.00	0.00	0.00
32.00	0.00	6	335.84	0.00	0.00	0.00
34.00	0.00	4	335.83	0.00	0.00	0.00
36.00	0.00	3	335.83	0.00	0.00	0.00
38.00	0.00	2	335.83	0.00	0.00	0.00
40.00	0.00	1	335.83	0.00	0.00	0.00
42.00	0.00	1	335.83	0.00	0.00	0.00
44.00	0.00	1	335.83	0.00	0.00	0.00
46.00	0.00	0	335.83	0.00	0.00	0.00
48.00	0.00	0	335.83	0.00	0.00	0.00
50.00	0.00	0	335.83	0.00	0.00	0.00
52.00	0.00	0	335.83	0.00	0.00	0.00
54.00	0.00	0	335.83	0.00	0.00	0.00
56.00	0.00	0	335.83	0.00	0.00	0.00
58.00	0.00	0	335.83	0.00	0.00	0.00
60.00	0.00	0	335.83	0.00	0.00	0.00
62.00	0.00	0	335.83	0.00	0.00	0.00
64.00	0.00	0	335.83	0.00	0.00	0.00
66.00	0.00	0	335.83	0.00	0.00	0.00
68.00	0.00	0	335.83	0.00	0.00	0.00
70.00	0.00	0	335.83	0.00	0.00	0.00
72.00	0.00	0	335.83	0.00	0.00	0.00
74.00	0.00	0	335.83	0.00	0.00	0.00
76.00	0.00	0	335.83	0.00	0.00	0.00
78.00	0.00	0	335.83	0.00	0.00	0.00
80.00	0.00	0	335.83	0.00	0.00	0.00
82.00	0.00	0	335.83	0.00	0.00	0.00
84.00	0.00	0	335.83	0.00	0.00	0.00
86.00	0.00	0	335.83	0.00	0.00	0.00
88.00	0.00	0	335.83	0.00	0.00	0.00
90.00	0.00	0	335.83	0.00	0.00	0.00
92.00	0.00	0	335.83	0.00	0.00	0.00
94.00	0.00	0	335.83	0.00	0.00	0.00
96.00	0.00	0	335.83	0.00	0.00	0.00

##

DMA No. 1 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.83	0.00	0.00	**0.00**
2.00	0.00	0	335.83	0.00	0.00	0.00
4.00	0.06	82	335.92	0.02	0.02	0.00
6.00	0.16	584	336.44	0.08	0.08	0.00
8.00	0.19	1,092	336.97	0.11	0.11	0.00
10.00	0.21	1,711	337.62	0.14	0.14	0.00
12.00	0.23	2,110	338.68	0.18	0.18	0.00
14.00	0.35	2,395	339.83	0.29	0.29	0.00
16.00	0.43	2,596	339.92	0.35	0.35	0.00
18.00	**0.79**	**3,119**	**340.14**	**0.68**	**0.68**	0.00
20.00	**0.31**	**2,667**	**339.95**	**0.38**	**0.38**	0.00
22.00	0.26	2,373	339.78	0.28	0.28	0.00
24.00	0.24	2,305	339.50	0.25	0.25	0.00
26.00	0.00	1,356	337.25	0.12	0.12	0.00
28.00	0.00	618	336.48	0.08	0.08	0.00
30.00	0.00	179	336.02	0.04	0.04	0.00
32.00	0.00	31	335.86	0.01	0.01	0.00
34.00	0.00	11	335.84	0.00	0.00	0.00
36.00	0.00	7	335.84	0.00	0.00	0.00
38.00	0.00	5	335.84	0.00	0.00	0.00
40.00	0.00	3	335.83	0.00	0.00	0.00
42.00	0.00	2	335.83	0.00	0.00	0.00
44.00	0.00	2	335.83	0.00	0.00	0.00
46.00	0.00	1	335.83	0.00	0.00	0.00
48.00	0.00	1	335.83	0.00	0.00	0.00
50.00	0.00	0	335.83	0.00	0.00	0.00
52.00	0.00	0	335.83	0.00	0.00	0.00
54.00	0.00	0	335.83	0.00	0.00	0.00
56.00	0.00	0	335.83	0.00	0.00	0.00
58.00	0.00	0	335.83	0.00	0.00	0.00
60.00	0.00	0	335.83	0.00	0.00	0.00
62.00	0.00	0	335.83	0.00	0.00	0.00
64.00	0.00	0	335.83	0.00	0.00	0.00
66.00	0.00	0	335.83	0.00	0.00	0.00
68.00	0.00	0	335.83	0.00	0.00	0.00
70.00	0.00	0	335.83	0.00	0.00	0.00
72.00	0.00	0	335.83	0.00	0.00	0.00
74.00	0.00	0	335.83	0.00	0.00	0.00
76.00	0.00	0	335.83	0.00	0.00	0.00
78.00	0.00	0	335.83	0.00	0.00	0.00
80.00	0.00	0	335.83	0.00	0.00	0.00
82.00	0.00	0	335.83	0.00	0.00	0.00
84.00	0.00	0	335.83	0.00	0.00	0.00
86.00	0.00	0	335.83	0.00	0.00	0.00
88.00	0.00	0	335.83	0.00	0.00	0.00
90.00	0.00	0	335.83	0.00	0.00	0.00
92.00	0.00	0	335.83	0.00	0.00	0.00
94.00	0.00	0	335.83	0.00	0.00	0.00
96.00	0.00	0	335.83	0.00	0.00	0.00

DMA No. 2 & 3 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.52	0.00	0.00	**0.00**
2.00	0.00	0	336.52	0.00	0.00	0.00
4.00	0.00	0	336.52	0.00	0.00	0.00
6.00	0.00	0	336.52	0.00	0.00	0.00
8.00	0.00	0	336.52	0.00	0.00	0.00
10.00	0.00	2	336.52	0.00	0.00	0.00
12.00	0.01	17	336.55	0.01	0.01	0.00
14.00	0.02	36	336.58	0.02	0.02	0.00
16.00	0.04	49	336.61	0.03	0.03	0.00
18.00	**0.09**	**84**	**336.67**	**0.08**	**0.08**	0.00
20.00	**0.04**	**59**	**336.62**	**0.04**	**0.04**	0.00
22.00	0.04	53	336.62	0.04	0.04	0.00
24.00	0.04	53	336.61	0.04	0.04	0.00
26.00	0.00	6	336.53	0.00	0.00	0.00
28.00	0.00	3	336.53	0.00	0.00	0.00
30.00	0.00	2	336.52	0.00	0.00	0.00
32.00	0.00	1	336.52	0.00	0.00	0.00
34.00	0.00	1	336.52	0.00	0.00	0.00
36.00	0.00	0	336.52	0.00	0.00	0.00
38.00	0.00	0	336.52	0.00	0.00	0.00
40.00	0.00	0	336.52	0.00	0.00	0.00
42.00	0.00	0	336.52	0.00	0.00	0.00
44.00	0.00	0	336.52	0.00	0.00	0.00
46.00	0.00	0	336.52	0.00	0.00	0.00
48.00	0.00	0	336.52	0.00	0.00	0.00
50.00	0.00	0	336.52	0.00	0.00	0.00
52.00	0.00	0	336.52	0.00	0.00	0.00
54.00	0.00	0	336.52	0.00	0.00	0.00
56.00	0.00	0	336.52	0.00	0.00	0.00
58.00	0.00	0	336.52	0.00	0.00	0.00
60.00	0.00	0	336.52	0.00	0.00	0.00
62.00	0.00	0	336.52	0.00	0.00	0.00
64.00	0.00	0	336.52	0.00	0.00	0.00
66.00	0.00	0	336.52	0.00	0.00	0.00
68.00	0.00	0	336.52	0.00	0.00	0.00
70.00	0.00	0	336.52	0.00	0.00	0.00
72.00	0.00	0	336.52	0.00	0.00	0.00
74.00	0.00	0	336.52	0.00	0.00	0.00
76.00	0.00	0	336.52	0.00	0.00	0.00
78.00	0.00	0	336.52	0.00	0.00	0.00
80.00	0.00	0	336.52	0.00	0.00	0.00
82.00	0.00	0	336.52	0.00	0.00	0.00
84.00	0.00	0	336.52	0.00	0.00	0.00
86.00	0.00	0	336.52	0.00	0.00	0.00
88.00	0.00	0	336.52	0.00	0.00	0.00
90.00	0.00	0	336.52	0.00	0.00	0.00
92.00	0.00	0	336.52	0.00	0.00	0.00
94.00	0.00	0	336.52	0.00	0.00	0.00
96.00	0.00	0	336.52	0.00	0.00	0.00
98.00	0.00	0	336.52	0.00	0.00	0.00
100.00	0.00	0	336.52	0.00	0.00	0.00

DMA No. 2 & 3 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.52	0.00	0.00	**0.00**
2.00	0.00	0	336.52	0.00	0.00	0.00
4.00	0.01	2	336.52	0.00	0.00	0.00
6.00	0.10	94	336.69	0.10	0.10	0.00
8.00	0.15	122	336.74	0.14	0.14	0.00
10.00	0.17	149	336.79	0.18	0.18	0.00
12.00	0.20	166	336.82	0.20	0.20	0.00
14.00	0.33	273	337.01	0.28	0.28	0.00
16.00	0.41	378	337.19	0.35	0.35	0.00
18.00	**0.78**	**860**	**338.06**	**0.67**	**0.67**	0.00
20.00	**0.32**	**421**	**337.27**	**0.37**	**0.37**	0.00
22.00	0.26	250	336.97	0.27	0.27	0.00
24.00	0.25	228	336.93	0.25	0.25	0.00
26.00	0.00	8	336.53	0.00	0.00	0.00
28.00	0.00	4	336.53	0.00	0.00	0.00
30.00	0.00	2	336.52	0.00	0.00	0.00
32.00	0.00	1	336.52	0.00	0.00	0.00
34.00	0.00	1	336.52	0.00	0.00	0.00
36.00	0.00	0	336.52	0.00	0.00	0.00
38.00	0.00	0	336.52	0.00	0.00	0.00
40.00	0.00	0	336.52	0.00	0.00	0.00
42.00	0.00	0	336.52	0.00	0.00	0.00
44.00	0.00	0	336.52	0.00	0.00	0.00
46.00	0.00	0	336.52	0.00	0.00	0.00
48.00	0.00	0	336.52	0.00	0.00	0.00
50.00	0.00	0	336.52	0.00	0.00	0.00
52.00	0.00	0	336.52	0.00	0.00	0.00
54.00	0.00	0	336.52	0.00	0.00	0.00
56.00	0.00	0	336.52	0.00	0.00	0.00
58.00	0.00	0	336.52	0.00	0.00	0.00
60.00	0.00	0	336.52	0.00	0.00	0.00
62.00	0.00	0	336.52	0.00	0.00	0.00
64.00	0.00	0	336.52	0.00	0.00	0.00
66.00	0.00	0	336.52	0.00	0.00	0.00
68.00	0.00	0	336.52	0.00	0.00	0.00
70.00	0.00	0	336.52	0.00	0.00	0.00
72.00	0.00	0	336.52	0.00	0.00	0.00
74.00	0.00	0	336.52	0.00	0.00	0.00
76.00	0.00	0	336.52	0.00	0.00	0.00
78.00	0.00	0	336.52	0.00	0.00	0.00
80.00	0.00	0	336.52	0.00	0.00	0.00
82.00	0.00	0	336.52	0.00	0.00	0.00
84.00	0.00	0	336.52	0.00	0.00	0.00
86.00	0.00	0	336.52	0.00	0.00	0.00
88.00	0.00	0	336.52	0.00	0.00	0.00
90.00	0.00	0	336.52	0.00	0.00	0.00
92.00	0.00	0	336.52	0.00	0.00	0.00
94.00	0.00	0	336.52	0.00	0.00	0.00
96.00	0.00	0	336.52	0.00	0.00	0.00
98.00	0.00	0	336.52	0.00	0.00	0.00
100.00	0.00	0	336.52	0.00	0.00	0.00

DMA No. 4 & 5 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.67	0.00	0.00	**0.00**
5.00	0.00	0	336.67	0.00	0.00	0.00
10.00	0.00	2	336.67	0.00	0.00	0.00
15.00	**0.02**	**45**	**336.75**	**0.02**	**0.02**	0.00
20.00	**0.04**	**70**	**336.80**	**0.04**	**0.04**	0.00
25.00	0.00	21	336.71	0.01	0.01	0.00
30.00	0.00	3	336.67	0.00	0.00	0.00
35.00	0.00	1	336.67	0.00	0.00	0.00
40.00	0.00	0	336.67	0.00	0.00	0.00
45.00	0.00	0	336.67	0.00	0.00	0.00
50.00	0.00	0	336.67	0.00	0.00	0.00
55.00	0.00	0	336.67	0.00	0.00	0.00
60.00	0.00	0	336.67	0.00	0.00	0.00
65.00	0.00	0	336.67	0.00	0.00	0.00
70.00	0.00	0	336.67	0.00	0.00	0.00
75.00	0.00	0	336.67	0.00	0.00	0.00
80.00	0.00	0	336.67	0.00	0.00	0.00
85.00	0.00	0	336.67	0.00	0.00	0.00
90.00	0.00	0	336.67	0.00	0.00	0.00
95.00	0.00	0	336.67	0.00	0.00	0.00
100.00	0.00	0	336.67	0.00	0.00	0.00
105.00	0.00	0	336.67	0.00	0.00	0.00
110.00	0.00	0	336.67	0.00	0.00	0.00
115.00	0.00	0	336.67	0.00	0.00	0.00
120.00	0.00	0	336.67	0.00	0.00	0.00
125.00	0.00	0	336.67	0.00	0.00	0.00

DMA No. 4 & 5 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.67	0.00	0.00	**0.00**
5.00	0.06	63	336.78	0.04	0.04	0.00
10.00	0.16	337	337.28	0.15	0.15	0.00
15.00	**0.27**	**835**	**338.18**	**0.25**	**0.25**	0.00
20.00	**0.28**	**1,116**	**338.76**	**0.30**	**0.30**	0.00
25.00	0.00	252	337.13	0.13	0.13	0.00
30.00	0.00	4	336.68	0.00	0.00	0.00
35.00	0.00	1	336.67	0.00	0.00	0.00
40.00	0.00	0	336.67	0.00	0.00	0.00
45.00	0.00	0	336.67	0.00	0.00	0.00
50.00	0.00	0	336.67	0.00	0.00	0.00
55.00	0.00	0	336.67	0.00	0.00	0.00
60.00	0.00	0	336.67	0.00	0.00	0.00
65.00	0.00	0	336.67	0.00	0.00	0.00
70.00	0.00	0	336.67	0.00	0.00	0.00
75.00	0.00	0	336.67	0.00	0.00	0.00
80.00	0.00	0	336.67	0.00	0.00	0.00
85.00	0.00	0	336.67	0.00	0.00	0.00
90.00	0.00	0	336.67	0.00	0.00	0.00
95.00	0.00	0	336.67	0.00	0.00	0.00
100.00	0.00	0	336.67	0.00	0.00	0.00
105.00	0.00	0	336.67	0.00	0.00	0.00
110.00	0.00	0	336.67	0.00	0.00	0.00
115.00	0.00	0	336.67	0.00	0.00	0.00
120.00	0.00	0	336.67	0.00	0.00	0.00
125.00	0.00	0	336.67	0.00	0.00	0.00

DMA No. 6 & 7 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.00	0	336.10	0.00	0.00	0.00
6.00	0.00	0	336.10	0.00	0.00	0.00
8.00	0.00	0	336.10	0.00	0.00	0.00
10.00	0.00	1	336.10	0.00	0.00	0.00
12.00	0.01	14	336.13	0.01	0.01	0.00
14.00	0.02	28	336.16	0.01	0.01	0.00
16.00	0.03	40	336.18	0.03	0.03	0.00
18.00	**0.08**	**68**	**336.23**	**0.07**	**0.07**	0.00
20.00	**0.04**	**49**	**336.20**	**0.04**	**0.04**	0.00
22.00	0.03	45	336.19	0.03	0.03	0.00
24.00	0.03	45	336.19	0.03	0.03	0.00
26.00	0.00	6	336.11	0.00	0.00	0.00
28.00	0.00	3	336.11	0.00	0.00	0.00
30.00	0.00	2	336.10	0.00	0.00	0.00
32.00	0.00	1	336.10	0.00	0.00	0.00
34.00	0.00	0	336.10	0.00	0.00	0.00
36.00	0.00	0	336.10	0.00	0.00	0.00
38.00	0.00	0	336.10	0.00	0.00	0.00
40.00	0.00	0	336.10	0.00	0.00	0.00
42.00	0.00	0	336.10	0.00	0.00	0.00
44.00	0.00	0	336.10	0.00	0.00	0.00
46.00	0.00	0	336.10	0.00	0.00	0.00
48.00	0.00	0	336.10	0.00	0.00	0.00
50.00	0.00	0	336.10	0.00	0.00	0.00
52.00	0.00	0	336.10	0.00	0.00	0.00
54.00	0.00	0	336.10	0.00	0.00	0.00
56.00	0.00	0	336.10	0.00	0.00	0.00
58.00	0.00	0	336.10	0.00	0.00	0.00
60.00	0.00	0	336.10	0.00	0.00	0.00
62.00	0.00	0	336.10	0.00	0.00	0.00
64.00	0.00	0	336.10	0.00	0.00	0.00
66.00	0.00	0	336.10	0.00	0.00	0.00
68.00	0.00	0	336.10	0.00	0.00	0.00
70.00	0.00	0	336.10	0.00	0.00	0.00
72.00	0.00	0	336.10	0.00	0.00	0.00
74.00	0.00	0	336.10	0.00	0.00	0.00
76.00	0.00	0	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 6 & 7 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.00	1	336.10	0.00	0.00	0.00
6.00	0.09	78	336.25	0.08	0.08	0.00
8.00	0.13	99	336.29	0.12	0.12	0.00
10.00	0.15	118	336.33	0.15	0.15	0.00
12.00	0.17	128	336.35	0.17	0.17	0.00
14.00	0.27	201	336.49	0.24	0.24	0.00
16.00	0.34	271	336.63	0.30	0.30	0.00
18.00	**0.65**	**535**	**337.14**	**0.56**	**0.56**	0.00
20.00	**0.28**	**278**	**336.64**	**0.31**	**0.31**	0.00
22.00	0.23	187	336.47	0.23	0.23	0.00
24.00	0.22	173	336.44	0.22	0.22	0.00
26.00	0.00	7	336.11	0.00	0.00	0.00
28.00	0.00	3	336.11	0.00	0.00	0.00
30.00	0.00	2	336.10	0.00	0.00	0.00
32.00	0.00	1	336.10	0.00	0.00	0.00
34.00	0.00	0	336.10	0.00	0.00	0.00
36.00	0.00	0	336.10	0.00	0.00	0.00
38.00	0.00	0	336.10	0.00	0.00	0.00
40.00	0.00	0	336.10	0.00	0.00	0.00
42.00	0.00	0	336.10	0.00	0.00	0.00
44.00	0.00	0	336.10	0.00	0.00	0.00
46.00	0.00	0	336.10	0.00	0.00	0.00
48.00	0.00	0	336.10	0.00	0.00	0.00
50.00	0.00	0	336.10	0.00	0.00	0.00
52.00	0.00	0	336.10	0.00	0.00	0.00
54.00	0.00	0	336.10	0.00	0.00	0.00
56.00	0.00	0	336.10	0.00	0.00	0.00
58.00	0.00	0	336.10	0.00	0.00	0.00
60.00	0.00	0	336.10	0.00	0.00	0.00
62.00	0.00	0	336.10	0.00	0.00	0.00
64.00	0.00	0	336.10	0.00	0.00	0.00
66.00	0.00	0	336.10	0.00	0.00	0.00
68.00	0.00	0	336.10	0.00	0.00	0.00
70.00	0.00	0	336.10	0.00	0.00	0.00
72.00	0.00	0	336.10	0.00	0.00	0.00
74.00	0.00	0	336.10	0.00	0.00	0.00
76.00	0.00	0	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 8 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.00	0	336.10	0.00	0.00	0.00
6.00	0.00	0	336.10	0.00	0.00	0.00
8.00	0.00	3	336.10	0.00	0.00	0.00
10.00	0.01	45	336.15	0.00	0.00	0.00
12.00	0.02	82	336.19	0.01	0.01	0.00
14.00	0.04	124	336.24	0.02	0.02	0.00
16.00	0.05	185	336.31	0.04	0.04	0.00
18.00	**0.11**	**360**	**336.51**	**0.06**	**0.06**	0.00
20.00	**0.05**	**476**	**336.64**	**0.07**	**0.07**	0.00
22.00	0.05	359	336.51	0.06	0.06	0.00
24.00	0.04	286	336.42	0.05	0.05	0.00
26.00	0.00	87	336.20	0.01	0.01	0.00
28.00	0.00	36	336.14	0.00	0.00	0.00
30.00	0.00	19	336.12	0.00	0.00	0.00
32.00	0.00	12	336.11	0.00	0.00	0.00
34.00	0.00	9	336.11	0.00	0.00	0.00
36.00	0.00	8	336.11	0.00	0.00	0.00
38.00	0.00	7	336.11	0.00	0.00	0.00
40.00	0.00	6	336.11	0.00	0.00	0.00
42.00	0.00	5	336.11	0.00	0.00	0.00
44.00	0.00	4	336.10	0.00	0.00	0.00
46.00	0.00	4	336.10	0.00	0.00	0.00
48.00	0.00	3	336.10	0.00	0.00	0.00
50.00	0.00	3	336.10	0.00	0.00	0.00
52.00	0.00	2	336.10	0.00	0.00	0.00
54.00	0.00	2	336.10	0.00	0.00	0.00
56.00	0.00	2	336.10	0.00	0.00	0.00
58.00	0.00	2	336.10	0.00	0.00	0.00
60.00	0.00	1	336.10	0.00	0.00	0.00
62.00	0.00	1	336.10	0.00	0.00	0.00
64.00	0.00	1	336.10	0.00	0.00	0.00
66.00	0.00	1	336.10	0.00	0.00	0.00
68.00	0.00	1	336.10	0.00	0.00	0.00
70.00	0.00	1	336.10	0.00	0.00	0.00
72.00	0.00	1	336.10	0.00	0.00	0.00
74.00	0.00	0	336.10	0.00	0.00	0.00
76.00	0.00	0	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 8 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.04	47	336.15	0.01	0.01	0.00
6.00	0.14	470	336.63	0.07	0.07	0.00
8.00	0.18	924	337.15	0.11	0.11	0.00
10.00	0.20	1,113	337.36	0.20	0.20	0.00
12.00	0.22	1,127	337.38	0.21	0.21	0.00
14.00	0.34	1,306	337.58	0.26	0.26	0.00
16.00	0.41	1,578	337.88	0.33	0.33	0.00
18.00	**0.75**	**2,164**	**339.86**	**0.59**	**0.59**	0.00
20.00	**0.32**	**1,829**	**338.35**	**0.40**	**0.40**	0.00
22.00	0.26	1,441	337.73	0.30	0.30	0.00
24.00	0.25	1,284	337.55	0.26	0.26	0.00
26.00	0.00	557	336.73	0.08	0.08	0.00
28.00	0.00	160	336.28	0.03	0.03	0.00
30.00	0.00	50	336.16	0.01	0.01	0.00
32.00	0.00	24	336.13	0.00	0.00	0.00
34.00	0.00	14	336.12	0.00	0.00	0.00
36.00	0.00	10	336.11	0.00	0.00	0.00
38.00	0.00	8	336.11	0.00	0.00	0.00
40.00	0.00	7	336.11	0.00	0.00	0.00
42.00	0.00	6	336.11	0.00	0.00	0.00
44.00	0.00	5	336.11	0.00	0.00	0.00
46.00	0.00	5	336.11	0.00	0.00	0.00
48.00	0.00	4	336.10	0.00	0.00	0.00
50.00	0.00	3	336.10	0.00	0.00	0.00
52.00	0.00	3	336.10	0.00	0.00	0.00
54.00	0.00	3	336.10	0.00	0.00	0.00
56.00	0.00	2	336.10	0.00	0.00	0.00
58.00	0.00	2	336.10	0.00	0.00	0.00
60.00	0.00	2	336.10	0.00	0.00	0.00
62.00	0.00	1	336.10	0.00	0.00	0.00
64.00	0.00	1	336.10	0.00	0.00	0.00
66.00	0.00	1	336.10	0.00	0.00	0.00
68.00	0.00	1	336.10	0.00	0.00	0.00
70.00	0.00	1	336.10	0.00	0.00	0.00
72.00	0.00	1	336.10	0.00	0.00	0.00
74.00	0.00	1	336.10	0.00	0.00	0.00
76.00	0.00	1	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 9 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.25	0.00	0.00	**0.00**
2.00	0.00	0	337.25	0.00	0.00	0.00
4.00	0.00	0	337.25	0.00	0.00	0.00
6.00	0.00	0	337.25	0.00	0.00	0.00
8.00	0.00	0	337.25	0.00	0.00	0.00
10.00	0.00	1	337.25	0.00	0.00	0.00
12.00	0.01	18	337.29	0.00	0.00	0.00
14.00	0.02	38	337.33	0.01	0.01	0.00
16.00	0.03	55	337.37	0.03	0.03	0.00
18.00	**0.07**	**93**	**337.45**	**0.06**	**0.06**	0.00
20.00	**0.04**	**70**	**337.40**	**0.04**	**0.04**	0.00
22.00	0.03	63	337.38	0.03	0.03	0.00
24.00	0.03	62	337.38	0.03	0.03	0.00
26.00	0.00	12	337.27	0.00	0.00	0.00
28.00	0.00	5	337.26	0.00	0.00	0.00
30.00	0.00	4	337.26	0.00	0.00	0.00
32.00	0.00	3	337.26	0.00	0.00	0.00
34.00	0.00	2	337.25	0.00	0.00	0.00
36.00	0.00	1	337.25	0.00	0.00	0.00
38.00	0.00	1	337.25	0.00	0.00	0.00
40.00	0.00	1	337.25	0.00	0.00	0.00
42.00	0.00	0	337.25	0.00	0.00	0.00
44.00	0.00	0	337.25	0.00	0.00	0.00
46.00	0.00	0	337.25	0.00	0.00	0.00
48.00	0.00	0	337.25	0.00	0.00	0.00
50.00	0.00	0	337.25	0.00	0.00	0.00
52.00	0.00	0	337.25	0.00	0.00	0.00
54.00	0.00	0	337.25	0.00	0.00	0.00
56.00	0.00	0	337.25	0.00	0.00	0.00
58.00	0.00	0	337.25	0.00	0.00	0.00
60.00	0.00	0	337.25	0.00	0.00	0.00
62.00	0.00	0	337.25	0.00	0.00	0.00
64.00	0.00	0	337.25	0.00	0.00	0.00
66.00	0.00	0	337.25	0.00	0.00	0.00
68.00	0.00	0	337.25	0.00	0.00	0.00
70.00	0.00	0	337.25	0.00	0.00	0.00
72.00	0.00	0	337.25	0.00	0.00	0.00
74.00	0.00	0	337.25	0.00	0.00	0.00
76.00	0.00	0	337.25	0.00	0.00	0.00
78.00	0.00	0	337.25	0.00	0.00	0.00
80.00	0.00	0	337.25	0.00	0.00	0.00
82.00	0.00	0	337.25	0.00	0.00	0.00
84.00	0.00	0	337.25	0.00	0.00	0.00
86.00	0.00	0	337.25	0.00	0.00	0.00

DMA No. 9 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.25	0.00	0.00	**0.00**
2.00	0.00	0	337.25	0.00	0.00	0.00
4.00	0.00	1	337.25	0.00	0.00	0.00
6.00	0.09	111	337.48	0.08	0.08	0.00
8.00	0.13	165	337.60	0.11	0.11	0.00
10.00	0.15	249	337.77	0.15	0.15	0.00
12.00	0.17	277	337.83	0.16	0.16	0.00
14.00	0.27	417	338.13	0.24	0.24	0.00
16.00	0.34	462	338.22	0.32	0.32	0.00
18.00	**0.64**	**654**	**338.62**	**0.55**	**0.55**	0.00
20.00	**0.27**	**442**	**338.18**	**0.28**	**0.28**	0.00
22.00	0.22	406	338.10	0.23	0.23	0.00
24.00	0.21	396	338.08	0.22	0.22	0.00
26.00	0.00	22	337.30	0.01	0.01	0.00
28.00	0.00	6	337.26	0.00	0.00	0.00
30.00	0.00	4	337.26	0.00	0.00	0.00
32.00	0.00	3	337.26	0.00	0.00	0.00
34.00	0.00	2	337.25	0.00	0.00	0.00
36.00	0.00	1	337.25	0.00	0.00	0.00
38.00	0.00	1	337.25	0.00	0.00	0.00
40.00	0.00	1	337.25	0.00	0.00	0.00
42.00	0.00	1	337.25	0.00	0.00	0.00
44.00	0.00	0	337.25	0.00	0.00	0.00
46.00	0.00	0	337.25	0.00	0.00	0.00
48.00	0.00	0	337.25	0.00	0.00	0.00
50.00	0.00	0	337.25	0.00	0.00	0.00
52.00	0.00	0	337.25	0.00	0.00	0.00
54.00	0.00	0	337.25	0.00	0.00	0.00
56.00	0.00	0	337.25	0.00	0.00	0.00
58.00	0.00	0	337.25	0.00	0.00	0.00
60.00	0.00	0	337.25	0.00	0.00	0.00
62.00	0.00	0	337.25	0.00	0.00	0.00
64.00	0.00	0	337.25	0.00	0.00	0.00
66.00	0.00	0	337.25	0.00	0.00	0.00
68.00	0.00	0	337.25	0.00	0.00	0.00
70.00	0.00	0	337.25	0.00	0.00	0.00
72.00	0.00	0	337.25	0.00	0.00	0.00
74.00	0.00	0	337.25	0.00	0.00	0.00
76.00	0.00	0	337.25	0.00	0.00	0.00
78.00	0.00	0	337.25	0.00	0.00	0.00
80.00	0.00	0	337.25	0.00	0.00	0.00
82.00	0.00	0	337.25	0.00	0.00	0.00
84.00	0.00	0	337.25	0.00	0.00	0.00
86.00	0.00	0	337.25	0.00	0.00	0.00

DMA No. 10 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.36	0.00	0.00	**0.00**
2.00	0.00	0	336.36	0.00	0.00	0.00
4.00	0.00	0	336.36	0.00	0.00	0.00
6.00	0.00	0	336.36	0.00	0.00	0.00
8.00	0.00	6	336.38	0.00	0.00	0.00
10.00	0.01	15	336.40	0.01	0.01	0.00
12.00	0.01	20	336.41	0.01	0.01	0.00
14.00	0.02	31	336.44	0.01	0.01	0.00
16.00	0.02	44	336.47	0.02	0.02	0.00
18.00	**0.05**	**92**	**336.59**	**0.03**	**0.03**	0.00
20.00	**0.02**	**91**	**336.58**	**0.03**	**0.03**	0.00
22.00	0.02	50	336.48	0.02	0.02	0.00
24.00	0.02	44	336.47	0.02	0.02	0.00
26.00	0.00	5	336.37	0.00	0.00	0.00
28.00	0.00	3	336.37	0.00	0.00	0.00
30.00	0.00	1	336.36	0.00	0.00	0.00
32.00	0.00	1	336.36	0.00	0.00	0.00
34.00	0.00	0	336.36	0.00	0.00	0.00
36.00	0.00	0	336.36	0.00	0.00	0.00
38.00	0.00	0	336.36	0.00	0.00	0.00
40.00	0.00	0	336.36	0.00	0.00	0.00
42.00	0.00	0	336.36	0.00	0.00	0.00
44.00	0.00	0	336.36	0.00	0.00	0.00
46.00	0.00	0	336.36	0.00	0.00	0.00
48.00	0.00	0	336.36	0.00	0.00	0.00
50.00	0.00	0	336.36	0.00	0.00	0.00
52.00	0.00	0	336.36	0.00	0.00	0.00
54.00	0.00	0	336.36	0.00	0.00	0.00
56.00	0.00	0	336.36	0.00	0.00	0.00
58.00	0.00	0	336.36	0.00	0.00	0.00
60.00	0.00	0	336.36	0.00	0.00	0.00
62.00	0.00	0	336.36	0.00	0.00	0.00
64.00	0.00	0	336.36	0.00	0.00	0.00
66.00	0.00	0	336.36	0.00	0.00	0.00
68.00	0.00	0	336.36	0.00	0.00	0.00
70.00	0.00	0	336.36	0.00	0.00	0.00
72.00	0.00	0	336.36	0.00	0.00	0.00
74.00	0.00	0	336.36	0.00	0.00	0.00
76.00	0.00	0	336.36	0.00	0.00	0.00
78.00	0.00	0	336.36	0.00	0.00	0.00
80.00	0.00	0	336.36	0.00	0.00	0.00
82.00	0.00	0	336.36	0.00	0.00	0.00
84.00	0.00	0	336.36	0.00	0.00	0.00
86.00	0.00	0	336.36	0.00	0.00	0.00

DMA No. 10 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.36	0.00	0.00	**0.00**
2.00	0.00	0	336.36	0.00	0.00	0.00
4.00	0.02	25	336.42	0.01	0.01	0.00
6.00	0.06	157	336.74	0.05	0.05	0.00
8.00	0.08	255	336.99	0.06	0.06	0.00
10.00	0.08	383	337.30	0.07	0.07	0.00
12.00	0.09	439	337.44	0.08	0.08	0.00
14.00	0.14	584	337.79	0.09	0.09	0.00
16.00	0.17	720	338.12	0.14	0.14	0.00
18.00	**0.31**	**915**	**339.30**	**0.25**	**0.25**	0.00
20.00	**0.13**	**763**	**338.23**	**0.16**	**0.16**	0.00
22.00	0.11	661	337.98	0.11	0.11	0.00
24.00	0.10	645	337.94	0.10	0.10	0.00
26.00	0.00	191	336.83	0.05	0.05	0.00
28.00	0.00	12	336.39	0.00	0.00	0.00
30.00	0.00	3	336.37	0.00	0.00	0.00
32.00	0.00	2	336.36	0.00	0.00	0.00
34.00	0.00	1	336.36	0.00	0.00	0.00
36.00	0.00	0	336.36	0.00	0.00	0.00
38.00	0.00	0	336.36	0.00	0.00	0.00
40.00	0.00	0	336.36	0.00	0.00	0.00
42.00	0.00	0	336.36	0.00	0.00	0.00
44.00	0.00	0	336.36	0.00	0.00	0.00
46.00	0.00	0	336.36	0.00	0.00	0.00
48.00	0.00	0	336.36	0.00	0.00	0.00
50.00	0.00	0	336.36	0.00	0.00	0.00
52.00	0.00	0	336.36	0.00	0.00	0.00
54.00	0.00	0	336.36	0.00	0.00	0.00
56.00	0.00	0	336.36	0.00	0.00	0.00
58.00	0.00	0	336.36	0.00	0.00	0.00
60.00	0.00	0	336.36	0.00	0.00	0.00
62.00	0.00	0	336.36	0.00	0.00	0.00
64.00	0.00	0	336.36	0.00	0.00	0.00
66.00	0.00	0	336.36	0.00	0.00	0.00
68.00	0.00	0	336.36	0.00	0.00	0.00
70.00	0.00	0	336.36	0.00	0.00	0.00
72.00	0.00	0	336.36	0.00	0.00	0.00
74.00	0.00	0	336.36	0.00	0.00	0.00
76.00	0.00	0	336.36	0.00	0.00	0.00
78.00	0.00	0	336.36	0.00	0.00	0.00
80.00	0.00	0	336.36	0.00	0.00	0.00
82.00	0.00	0	336.36	0.00	0.00	0.00
84.00	0.00	0	336.36	0.00	0.00	0.00
86.00	0.00	0	336.36	0.00	0.00	0.00

DMA No. 11 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.18	0.00	0.00	**0.00**
2.00	0.00	0	337.18	0.00	0.00	0.00
4.00	0.00	0	337.18	0.00	0.00	0.00
6.00	0.00	0	337.18	0.00	0.00	0.00
8.00	0.00	11	337.21	0.00	0.00	0.00
10.00	0.01	24	337.24	0.01	0.01	0.00
12.00	0.01	32	337.26	0.01	0.01	0.00
14.00	0.02	50	337.30	0.01	0.01	0.00
16.00	0.03	76	337.36	0.02	0.02	0.00
18.00	**0.06**	**162**	**337.57**	**0.03**	**0.03**	0.00
20.00	**0.02**	**183**	**337.62**	**0.03**	**0.03**	0.00
22.00	0.02	125	337.48	0.03	0.03	0.00
24.00	0.02	94	337.40	0.02	0.02	0.00
26.00	0.00	15	337.22	0.00	0.00	0.00
28.00	0.00	5	337.19	0.00	0.00	0.00
30.00	0.00	3	337.19	0.00	0.00	0.00
32.00	0.00	2	337.18	0.00	0.00	0.00
34.00	0.00	1	337.18	0.00	0.00	0.00
36.00	0.00	1	337.18	0.00	0.00	0.00
38.00	0.00	1	337.18	0.00	0.00	0.00
40.00	0.00	0	337.18	0.00	0.00	0.00
42.00	0.00	0	337.18	0.00	0.00	0.00
44.00	0.00	0	337.18	0.00	0.00	0.00
46.00	0.00	0	337.18	0.00	0.00	0.00
48.00	0.00	0	337.18	0.00	0.00	0.00
50.00	0.00	0	337.18	0.00	0.00	0.00
52.00	0.00	0	337.18	0.00	0.00	0.00
54.00	0.00	0	337.18	0.00	0.00	0.00
56.00	0.00	0	337.18	0.00	0.00	0.00
58.00	0.00	0	337.18	0.00	0.00	0.00
60.00	0.00	0	337.18	0.00	0.00	0.00
62.00	0.00	0	337.18	0.00	0.00	0.00
64.00	0.00	0	337.18	0.00	0.00	0.00
66.00	0.00	0	337.18	0.00	0.00	0.00
68.00	0.00	0	337.18	0.00	0.00	0.00
70.00	0.00	0	337.18	0.00	0.00	0.00
72.00	0.00	0	337.18	0.00	0.00	0.00
74.00	0.00	0	337.18	0.00	0.00	0.00
76.00	0.00	0	337.18	0.00	0.00	0.00
78.00	0.00	0	337.18	0.00	0.00	0.00
80.00	0.00	0	337.18	0.00	0.00	0.00
82.00	0.00	0	337.18	0.00	0.00	0.00
84.00	0.00	0	337.18	0.00	0.00	0.00
86.00	0.00	0	337.18	0.00	0.00	0.00

DMA No. 11 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.18	0.00	0.00	**0.00**
2.00	0.00	0	337.18	0.00	0.00	0.00
4.00	0.03	44	337.29	0.01	0.01	0.00
6.00	0.07	248	337.77	0.04	0.04	0.00
8.00	0.08	428	338.20	0.05	0.05	0.00
10.00	0.08	640	338.70	0.06	0.06	0.00
12.00	0.09	777	339.03	0.07	0.07	0.00
14.00	0.15	957	340.26	0.14	0.14	0.00
16.00	0.18	980	340.49	0.16	0.16	0.00
18.00	**0.33**	**1,122**	**341.25**	**0.29**	**0.29**	0.00
20.00	**0.13**	**954**	**340.23**	**0.13**	**0.13**	0.00
22.00	0.10	940	340.10	0.10	0.10	0.00
24.00	0.10	937	340.08	0.10	0.10	0.00
26.00	0.00	490	338.35	0.06	0.06	0.00
28.00	0.00	174	337.59	0.03	0.03	0.00
30.00	0.00	29	337.25	0.01	0.01	0.00
32.00	0.00	6	337.19	0.00	0.00	0.00
34.00	0.00	3	337.19	0.00	0.00	0.00
36.00	0.00	2	337.19	0.00	0.00	0.00
38.00	0.00	1	337.18	0.00	0.00	0.00
40.00	0.00	1	337.18	0.00	0.00	0.00
42.00	0.00	1	337.18	0.00	0.00	0.00
44.00	0.00	0	337.18	0.00	0.00	0.00
46.00	0.00	0	337.18	0.00	0.00	0.00
48.00	0.00	0	337.18	0.00	0.00	0.00
50.00	0.00	0	337.18	0.00	0.00	0.00
52.00	0.00	0	337.18	0.00	0.00	0.00
54.00	0.00	0	337.18	0.00	0.00	0.00
56.00	0.00	0	337.18	0.00	0.00	0.00
58.00	0.00	0	337.18	0.00	0.00	0.00
60.00	0.00	0	337.18	0.00	0.00	0.00
62.00	0.00	0	337.18	0.00	0.00	0.00
64.00	0.00	0	337.18	0.00	0.00	0.00
66.00	0.00	0	337.18	0.00	0.00	0.00
68.00	0.00	0	337.18	0.00	0.00	0.00
70.00	0.00	0	337.18	0.00	0.00	0.00
72.00	0.00	0	337.18	0.00	0.00	0.00
74.00	0.00	0	337.18	0.00	0.00	0.00
76.00	0.00	0	337.18	0.00	0.00	0.00
78.00	0.00	0	337.18	0.00	0.00	0.00
80.00	0.00	0	337.18	0.00	0.00	0.00
82.00	0.00	0	337.18	0.00	0.00	0.00
84.00	0.00	0	337.18	0.00	0.00	0.00
86.00	0.00	0	337.18	0.00	0.00	0.00

DMA No. 12 & 13 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.00	0	337.37	0.00	0.00	0.00
7.50	0.00	0	337.37	0.00	0.00	0.00
10.00	0.00	15	337.40	0.00	0.00	0.00
12.50	0.01	31	337.44	0.01	0.01	0.00
15.00	0.02	48	337.48	0.02	0.02	0.00
17.50	**0.04**	**80**	**337.55**	**0.03**	**0.03**	0.00
20.00	**0.03**	**81**	**337.55**	**0.03**	**0.03**	0.00
22.50	0.02	59	337.50	0.02	0.02	0.00
25.00	0.00	24	337.42	0.01	0.01	0.00
27.50	0.00	6	337.38	0.00	0.00	0.00
30.00	0.00	4	337.38	0.00	0.00	0.00
32.50	0.00	3	337.38	0.00	0.00	0.00
35.00	0.00	2	337.37	0.00	0.00	0.00
37.50	0.00	1	337.37	0.00	0.00	0.00
40.00	0.00	1	337.37	0.00	0.00	0.00
42.50	0.00	1	337.37	0.00	0.00	0.00
45.00	0.00	0	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

MH engineering Co.
16075 Vineyard Blvd., Morgan Hill, CA 95037 - (408) 779-7381

DMA No. 12 & 13 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.05	81	337.55	0.03	0.03	0.00
7.50	0.08	209	337.84	0.07	0.07	0.00
10.00	0.10	359	338.18	0.09	0.09	0.00
12.50	0.12	406	338.29	0.11	0.11	0.00
15.00	0.15	453	338.39	0.16	0.16	0.00
17.50	**0.30**	**575**	**338.66**	**0.25**	**0.25**	0.00
20.00	**0.16**	**467**	**338.42**	**0.18**	**0.18**	0.00
22.50	0.13	425	338.33	0.13	0.13	0.00
25.00	0.00	179	337.77	0.06	0.06	0.00
27.50	0.00	13	337.40	0.00	0.00	0.00
30.00	0.00	5	337.38	0.00	0.00	0.00
32.50	0.00	3	337.38	0.00	0.00	0.00
35.00	0.00	2	337.37	0.00	0.00	0.00
37.50	0.00	2	337.37	0.00	0.00	0.00
40.00	0.00	1	337.37	0.00	0.00	0.00
42.50	0.00	1	337.37	0.00	0.00	0.00
45.00	0.00	1	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 14 & 15 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.00	0	337.37	0.00	0.00	0.00
7.50	0.00	0	337.37	0.00	0.00	0.00
10.00	0.00	2	337.37	0.00	0.00	0.00
12.50	0.01	17	337.40	0.01	0.01	0.00
15.00	0.02	34	337.44	0.02	0.02	0.00
17.50	**0.06**	**55**	**337.48**	**0.05**	**0.05**	0.00
20.00	**0.04**	**47**	**337.46**	**0.04**	**0.04**	0.00
22.50	0.03	43	337.45	0.03	0.03	0.00
25.00	0.00	11	337.39	0.00	0.00	0.00
27.50	0.00	3	337.38	0.00	0.00	0.00
30.00	0.00	1	337.37	0.00	0.00	0.00
32.50	0.00	1	337.37	0.00	0.00	0.00
35.00	0.00	0	337.37	0.00	0.00	0.00
37.50	0.00	0	337.37	0.00	0.00	0.00
40.00	0.00	0	337.37	0.00	0.00	0.00
42.50	0.00	0	337.37	0.00	0.00	0.00
45.00	0.00	0	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 14 & 15 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.06	52	337.47	0.04	0.04	0.00
7.50	0.11	88	337.54	0.10	0.10	0.00
10.00	0.14	112	337.59	0.15	0.15	0.00
12.50	0.18	132	337.63	0.17	0.17	0.00
15.00	0.24	215	337.80	0.26	0.26	0.00
17.50	**0.50**	**440**	**338.24**	**0.42**	**0.42**	0.00
20.00	**0.26**	**244**	**337.86**	**0.28**	**0.28**	0.00
22.50	0.21	167	337.70	0.21	0.21	0.00
25.00	0.00	17	337.40	0.01	0.01	0.00
27.50	0.00	3	337.38	0.00	0.00	0.00
30.00	0.00	2	337.37	0.00	0.00	0.00
32.50	0.00	1	337.37	0.00	0.00	0.00
35.00	0.00	0	337.37	0.00	0.00	0.00
37.50	0.00	0	337.37	0.00	0.00	0.00
40.00	0.00	0	337.37	0.00	0.00	0.00
42.50	0.00	0	337.37	0.00	0.00	0.00
45.00	0.00	0	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 16 & 17 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.87	0.00	0.00	**0.00**
2.00	0.00	0	336.87	0.00	0.00	0.00
4.00	0.00	0	336.87	0.00	0.00	0.00
6.00	0.00	0	336.87	0.00	0.00	0.00
8.00	0.00	0	336.87	0.00	0.00	0.00
10.00	0.00	1	336.87	0.00	0.00	0.00
12.00	0.01	15	336.90	0.00	0.00	0.00
14.00	0.02	32	336.93	0.01	0.01	0.00
16.00	0.03	45	336.96	0.03	0.03	0.00
18.00	**0.07**	**83**	**337.03**	**0.06**	**0.06**	0.00
20.00	**0.04**	**61**	**336.99**	**0.04**	**0.04**	0.00
22.00	0.03	53	336.97	0.03	0.03	0.00
24.00	0.03	52	336.97	0.03	0.03	0.00
26.00	0.00	7	336.88	0.00	0.00	0.00
28.00	0.00	4	336.88	0.00	0.00	0.00
30.00	0.00	2	336.87	0.00	0.00	0.00
32.00	0.00	1	336.87	0.00	0.00	0.00
34.00	0.00	1	336.87	0.00	0.00	0.00
36.00	0.00	0	336.87	0.00	0.00	0.00
38.00	0.00	0	336.87	0.00	0.00	0.00
40.00	0.00	0	336.87	0.00	0.00	0.00
42.00	0.00	0	336.87	0.00	0.00	0.00
44.00	0.00	0	336.87	0.00	0.00	0.00
46.00	0.00	0	336.87	0.00	0.00	0.00
48.00	0.00	0	336.87	0.00	0.00	0.00
50.00	0.00	0	336.87	0.00	0.00	0.00
52.00	0.00	0	336.87	0.00	0.00	0.00
54.00	0.00	0	336.87	0.00	0.00	0.00
56.00	0.00	0	336.87	0.00	0.00	0.00
58.00	0.00	0	336.87	0.00	0.00	0.00
60.00	0.00	0	336.87	0.00	0.00	0.00
62.00	0.00	0	336.87	0.00	0.00	0.00
64.00	0.00	0	336.87	0.00	0.00	0.00
66.00	0.00	0	336.87	0.00	0.00	0.00
68.00	0.00	0	336.87	0.00	0.00	0.00
70.00	0.00	0	336.87	0.00	0.00	0.00
72.00	0.00	0	336.87	0.00	0.00	0.00
74.00	0.00	0	336.87	0.00	0.00	0.00
76.00	0.00	0	336.87	0.00	0.00	0.00
78.00	0.00	0	336.87	0.00	0.00	0.00
80.00	0.00	0	336.87	0.00	0.00	0.00
82.00	0.00	0	336.87	0.00	0.00	0.00
84.00	0.00	0	336.87	0.00	0.00	0.00
86.00	0.00	0	336.87	0.00	0.00	0.00

DMA No. 16 & 17 100 vear event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.87	0.00	0.00	**0.00**
2.00	0.00	0	336.87	0.00	0.00	0.00
4.00	0.00	1	336.87	0.00	0.00	0.00
6.00	0.08	104	337.07	0.07	0.07	0.00
8.00	0.12	168	337.20	0.10	0.10	0.00
10.00	0.14	271	337.40	0.14	0.14	0.00
12.00	0.16	306	337.47	0.15	0.15	0.00
14.00	0.26	485	337.82	0.20	0.20	0.00
16.00	0.32	674	338.19	0.29	0.29	0.00
18.00	**0.61**	**976**	**338.78**	**0.47**	**0.47**	0.00
20.00	**0.26**	**681**	**338.20**	**0.30**	**0.30**	0.00
22.00	0.21	595	338.03	0.22	0.22	0.00
24.00	0.20	556	337.96	0.21	0.21	0.00
26.00	0.00	23	336.91	0.01	0.01	0.00
28.00	0.00	5	336.88	0.00	0.00	0.00
30.00	0.00	3	336.88	0.00	0.00	0.00
32.00	0.00	2	336.87	0.00	0.00	0.00
34.00	0.00	1	336.87	0.00	0.00	0.00
36.00	0.00	1	336.87	0.00	0.00	0.00
38.00	0.00	0	336.87	0.00	0.00	0.00
40.00	0.00	0	336.87	0.00	0.00	0.00
42.00	0.00	0	336.87	0.00	0.00	0.00
44.00	0.00	0	336.87	0.00	0.00	0.00
46.00	0.00	0	336.87	0.00	0.00	0.00
48.00	0.00	0	336.87	0.00	0.00	0.00
50.00	0.00	0	336.87	0.00	0.00	0.00
52.00	0.00	0	336.87	0.00	0.00	0.00
54.00	0.00	0	336.87	0.00	0.00	0.00
56.00	0.00	0	336.87	0.00	0.00	0.00
58.00	0.00	0	336.87	0.00	0.00	0.00
60.00	0.00	0	336.87	0.00	0.00	0.00
62.00	0.00	0	336.87	0.00	0.00	0.00
64.00	0.00	0	336.87	0.00	0.00	0.00
66.00	0.00	0	336.87	0.00	0.00	0.00
68.00	0.00	0	336.87	0.00	0.00	0.00
70.00	0.00	0	336.87	0.00	0.00	0.00
72.00	0.00	0	336.87	0.00	0.00	0.00
74.00	0.00	0	336.87	0.00	0.00	0.00
76.00	0.00	0	336.87	0.00	0.00	0.00
78.00	0.00	0	336.87	0.00	0.00	0.00
80.00	0.00	0	336.87	0.00	0.00	0.00
82.00	0.00	0	336.87	0.00	0.00	0.00
84.00	0.00	0	336.87	0.00	0.00	0.00
86.00	0.00	0	336.87	0.00	0.00	0.00

DMA No. 18 & 19 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.16	0.00	0.00	**0.00**
2.00	0.00	0	336.16	0.00	0.00	0.00
4.00	0.00	0	336.16	0.00	0.00	0.00
6.00	0.00	0	336.16	0.00	0.00	0.00
8.00	0.00	1	336.16	0.00	0.00	0.00
10.00	0.01	40	336.19	0.01	0.01	0.00
12.00	0.02	77	336.22	0.02	0.02	0.00
14.00	0.05	114	336.25	0.04	0.04	0.00
16.00	0.07	154	336.28	0.06	0.06	0.00
18.00	**0.16**	**276**	**336.37**	**0.11**	**0.11**	0.00
20.00	**0.08**	**240**	**336.34**	**0.10**	**0.10**	0.00
22.00	0.06	172	336.29	0.07	0.07	0.00
24.00	0.06	164	336.29	0.06	0.06	0.00
26.00	0.00	37	336.19	0.01	0.01	0.00
28.00	0.00	15	336.17	0.00	0.00	0.00
30.00	0.00	11	336.17	0.00	0.00	0.00
32.00	0.00	8	336.17	0.00	0.00	0.00
34.00	0.00	6	336.16	0.00	0.00	0.00
36.00	0.00	4	336.16	0.00	0.00	0.00
38.00	0.00	3	336.16	0.00	0.00	0.00
40.00	0.00	2	336.16	0.00	0.00	0.00
42.00	0.00	2	336.16	0.00	0.00	0.00
44.00	0.00	1	336.16	0.00	0.00	0.00
46.00	0.00	1	336.16	0.00	0.00	0.00
48.00	0.00	1	336.16	0.00	0.00	0.00
50.00	0.00	1	336.16	0.00	0.00	0.00
52.00	0.00	0	336.16	0.00	0.00	0.00
54.00	0.00	0	336.16	0.00	0.00	0.00
56.00	0.00	0	336.16	0.00	0.00	0.00
58.00	0.00	0	336.16	0.00	0.00	0.00
60.00	0.00	0	336.16	0.00	0.00	0.00
62.00	0.00	0	336.16	0.00	0.00	0.00
64.00	0.00	0	336.16	0.00	0.00	0.00
66.00	0.00	0	336.16	0.00	0.00	0.00
68.00	0.00	0	336.16	0.00	0.00	0.00
70.00	0.00	0	336.16	0.00	0.00	0.00
72.00	0.00	0	336.16	0.00	0.00	0.00
74.00	0.00	0	336.16	0.00	0.00	0.00
76.00	0.00	0	336.16	0.00	0.00	0.00
78.00	0.00	0	336.16	0.00	0.00	0.00
80.00	0.00	0	336.16	0.00	0.00	0.00
82.00	0.00	0	336.16	0.00	0.00	0.00
84.00	0.00	0	336.16	0.00	0.00	0.00
86.00	0.00	0	336.16	0.00	0.00	0.00

DMA No. 18 & 19 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.16	0.00	0.00	**0.00**
2.00	0.00	0	336.16	0.00	0.00	0.00
4.00	0.04	44	336.19	0.01	0.01	0.00
6.00	0.19	400	336.47	0.15	0.15	0.00
8.00	0.25	642	336.65	0.20	0.20	0.00
10.00	0.28	991	336.92	0.26	0.26	0.00
12.00	0.31	1,130	337.03	0.28	0.28	0.00
14.00	0.48	1,578	337.37	0.33	0.33	0.00
16.00	0.59	2,393	338.00	0.42	0.42	0.00
18.00	**1.10**	**4,078**	**339.37**	**0.71**	**0.71**	0.00
20.00	**0.46**	**3,967**	**339.28**	**0.69**	**0.69**	0.00
22.00	0.38	3,062	338.54	0.48	0.48	0.00
24.00	0.36	2,484	338.07	0.43	0.43	0.00
26.00	0.00	569	336.60	0.19	0.19	0.00
28.00	0.00	55	336.20	0.01	0.01	0.00
30.00	0.00	18	336.17	0.00	0.00	0.00
32.00	0.00	12	336.17	0.00	0.00	0.00
34.00	0.00	9	336.17	0.00	0.00	0.00
36.00	0.00	6	336.16	0.00	0.00	0.00
38.00	0.00	5	336.16	0.00	0.00	0.00
40.00	0.00	3	336.16	0.00	0.00	0.00
42.00	0.00	3	336.16	0.00	0.00	0.00
44.00	0.00	2	336.16	0.00	0.00	0.00
46.00	0.00	1	336.16	0.00	0.00	0.00
48.00	0.00	1	336.16	0.00	0.00	0.00
50.00	0.00	1	336.16	0.00	0.00	0.00
52.00	0.00	1	336.16	0.00	0.00	0.00
54.00	0.00	0	336.16	0.00	0.00	0.00
56.00	0.00	0	336.16	0.00	0.00	0.00
58.00	0.00	0	336.16	0.00	0.00	0.00
60.00	0.00	0	336.16	0.00	0.00	0.00
62.00	0.00	0	336.16	0.00	0.00	0.00
64.00	0.00	0	336.16	0.00	0.00	0.00
66.00	0.00	0	336.16	0.00	0.00	0.00
68.00	0.00	0	336.16	0.00	0.00	0.00
70.00	0.00	0	336.16	0.00	0.00	0.00
72.00	0.00	0	336.16	0.00	0.00	0.00
74.00	0.00	0	336.16	0.00	0.00	0.00
76.00	0.00	0	336.16	0.00	0.00	0.00
78.00	0.00	0	336.16	0.00	0.00	0.00
80.00	0.00	0	336.16	0.00	0.00	0.00
82.00	0.00	0	336.16	0.00	0.00	0.00
84.00	0.00	0	336.16	0.00	0.00	0.00
86.00	0.00	0	336.16	0.00	0.00	0.00

DMA No. 20 & 21 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.13	0.00	0.00	**0.00**
2.00	0.00	0	336.13	0.00	0.00	0.00
4.00	0.00	0	336.13	0.00	0.00	0.00
6.00	0.00	0	336.13	0.00	0.00	0.00
8.00	0.00	0	336.13	0.00	0.00	0.00
10.00	0.00	7	336.14	0.00	0.00	0.00
12.00	0.01	23	336.16	0.01	0.01	0.00
14.00	0.03	46	336.20	0.02	0.02	0.00
16.00	0.04	64	336.22	0.04	0.04	0.00
18.00	**0.10**	**109**	**336.29**	**0.09**	**0.09**	0.00
20.00	**0.05**	**76**	**336.24**	**0.05**	**0.05**	0.00
22.00	0.04	69	336.23	0.04	0.04	0.00
24.00	0.04	68	336.23	0.04	0.04	0.00
26.00	0.00	9	336.14	0.00	0.00	0.00
28.00	0.00	5	336.14	0.00	0.00	0.00
30.00	0.00	3	336.13	0.00	0.00	0.00
32.00	0.00	2	336.13	0.00	0.00	0.00
34.00	0.00	1	336.13	0.00	0.00	0.00
36.00	0.00	1	336.13	0.00	0.00	0.00
38.00	0.00	0	336.13	0.00	0.00	0.00
40.00	0.00	0	336.13	0.00	0.00	0.00
42.00	0.00	0	336.13	0.00	0.00	0.00
44.00	0.00	0	336.13	0.00	0.00	0.00
46.00	0.00	0	336.13	0.00	0.00	0.00
48.00	0.00	0	336.13	0.00	0.00	0.00
50.00	0.00	0	336.13	0.00	0.00	0.00
52.00	0.00	0	336.13	0.00	0.00	0.00
54.00	0.00	0	336.13	0.00	0.00	0.00
56.00	0.00	0	336.13	0.00	0.00	0.00
58.00	0.00	0	336.13	0.00	0.00	0.00
60.00	0.00	0	336.13	0.00	0.00	0.00
62.00	0.00	0	336.13	0.00	0.00	0.00
64.00	0.00	0	336.13	0.00	0.00	0.00
66.00	0.00	0	336.13	0.00	0.00	0.00
68.00	0.00	0	336.13	0.00	0.00	0.00
70.00	0.00	0	336.13	0.00	0.00	0.00
72.00	0.00	0	336.13	0.00	0.00	0.00
74.00	0.00	0	336.13	0.00	0.00	0.00
76.00	0.00	0	336.13	0.00	0.00	0.00
78.00	0.00	0	336.13	0.00	0.00	0.00
80.00	0.00	0	336.13	0.00	0.00	0.00
82.00	0.00	0	336.13	0.00	0.00	0.00
84.00	0.00	0	336.13	0.00	0.00	0.00
86.00	0.00	0	336.13	0.00	0.00	0.00

DMA No. 20 & 21 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.13	0.00	0.00	**0.00**
2.00	0.00	0	336.13	0.00	0.00	0.00
4.00	0.01	7	336.14	0.00	0.00	0.00
6.00	0.12	125	336.31	0.11	0.11	0.00
8.00	0.16	160	336.36	0.15	0.15	0.00
10.00	0.19	200	336.42	0.19	0.19	0.00
12.00	0.22	220	336.45	0.21	0.21	0.00
14.00	0.35	355	336.64	0.29	0.29	0.00
16.00	0.43	496	336.85	0.36	0.36	0.00
18.00	**0.82**	**1,133**	**337.77**	**0.58**	**0.58**	0.00
20.00	**0.33**	**706**	**337.15**	**0.45**	**0.45**	0.00
22.00	0.27	344	336.63	0.29	0.29	0.00
24.00	0.26	303	336.57	0.26	0.26	0.00
26.00	0.00	13	336.15	0.00	0.00	0.00
28.00	0.00	6	336.14	0.00	0.00	0.00
30.00	0.00	4	336.14	0.00	0.00	0.00
32.00	0.00	2	336.13	0.00	0.00	0.00
34.00	0.00	1	336.13	0.00	0.00	0.00
36.00	0.00	1	336.13	0.00	0.00	0.00
38.00	0.00	1	336.13	0.00	0.00	0.00
40.00	0.00	0	336.13	0.00	0.00	0.00
42.00	0.00	0	336.13	0.00	0.00	0.00
44.00	0.00	0	336.13	0.00	0.00	0.00
46.00	0.00	0	336.13	0.00	0.00	0.00
48.00	0.00	0	336.13	0.00	0.00	0.00
50.00	0.00	0	336.13	0.00	0.00	0.00
52.00	0.00	0	336.13	0.00	0.00	0.00
54.00	0.00	0	336.13	0.00	0.00	0.00
56.00	0.00	0	336.13	0.00	0.00	0.00
58.00	0.00	0	336.13	0.00	0.00	0.00
60.00	0.00	0	336.13	0.00	0.00	0.00
62.00	0.00	0	336.13	0.00	0.00	0.00
64.00	0.00	0	336.13	0.00	0.00	0.00
66.00	0.00	0	336.13	0.00	0.00	0.00
68.00	0.00	0	336.13	0.00	0.00	0.00
70.00	0.00	0	336.13	0.00	0.00	0.00
72.00	0.00	0	336.13	0.00	0.00	0.00
74.00	0.00	0	336.13	0.00	0.00	0.00
76.00	0.00	0	336.13	0.00	0.00	0.00
78.00	0.00	0	336.13	0.00	0.00	0.00
80.00	0.00	0	336.13	0.00	0.00	0.00
82.00	0.00	0	336.13	0.00	0.00	0.00
84.00	0.00	0	336.13	0.00	0.00	0.00
86.00	0.00	0	336.13	0.00	0.00	0.00

DMA No. 22 & 23 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.65	0.00	0.00	**0.00**
2.00	0.00	0	337.65	0.00	0.00	0.00
4.00	0.00	0	337.65	0.00	0.00	0.00
6.00	0.00	0	337.65	0.00	0.00	0.00
8.00	0.00	0	337.65	0.00	0.00	0.00
10.00	0.01	11	337.67	0.00	0.00	0.00
12.00	0.01	24	337.69	0.01	0.01	0.00
14.00	0.03	42	337.72	0.02	0.02	0.00
16.00	0.04	55	337.74	0.04	0.04	0.00
18.00	**0.10**	**98**	**337.80**	**0.08**	**0.08**	0.00
20.00	**0.04**	**65**	**337.75**	**0.05**	**0.05**	0.00
22.00	0.04	58	337.74	0.04	0.04	0.00
24.00	0.04	57	337.74	0.04	0.04	0.00
26.00	0.00	7	337.66	0.00	0.00	0.00
28.00	0.00	4	337.66	0.00	0.00	0.00
30.00	0.00	2	337.65	0.00	0.00	0.00
32.00	0.00	1	337.65	0.00	0.00	0.00
34.00	0.00	1	337.65	0.00	0.00	0.00
36.00	0.00	0	337.65	0.00	0.00	0.00
38.00	0.00	0	337.65	0.00	0.00	0.00
40.00	0.00	0	337.65	0.00	0.00	0.00
42.00	0.00	0	337.65	0.00	0.00	0.00
44.00	0.00	0	337.65	0.00	0.00	0.00
46.00	0.00	0	337.65	0.00	0.00	0.00
48.00	0.00	0	337.65	0.00	0.00	0.00
50.00	0.00	0	337.65	0.00	0.00	0.00
52.00	0.00	0	337.65	0.00	0.00	0.00
54.00	0.00	0	337.65	0.00	0.00	0.00
56.00	0.00	0	337.65	0.00	0.00	0.00
58.00	0.00	0	337.65	0.00	0.00	0.00
60.00	0.00	0	337.65	0.00	0.00	0.00
62.00	0.00	0	337.65	0.00	0.00	0.00
64.00	0.00	0	337.65	0.00	0.00	0.00
66.00	0.00	0	337.65	0.00	0.00	0.00
68.00	0.00	0	337.65	0.00	0.00	0.00
70.00	0.00	0	337.65	0.00	0.00	0.00
72.00	0.00	0	337.65	0.00	0.00	0.00
74.00	0.00	0	337.65	0.00	0.00	0.00
76.00	0.00	0	337.65	0.00	0.00	0.00
78.00	0.00	0	337.65	0.00	0.00	0.00
80.00	0.00	0	337.65	0.00	0.00	0.00
82.00	0.00	0	337.65	0.00	0.00	0.00
84.00	0.00	0	337.65	0.00	0.00	0.00
86.00	0.00	0	337.65	0.00	0.00	0.00

DMA No. 22 & 23 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.65	0.00	0.00	**0.00**
2.00	0.00	0	337.65	0.00	0.00	0.00
4.00	0.02	13	337.67	0.00	0.00	0.00
6.00	0.11	122	337.84	0.10	0.10	0.00
8.00	0.15	174	337.92	0.14	0.14	0.00
10.00	0.17	249	338.04	0.17	0.17	0.00
12.00	0.20	273	338.08	0.18	0.18	0.00
14.00	0.31	449	338.35	0.25	0.25	0.00
16.00	0.39	676	338.71	0.32	0.32	0.00
18.00	**0.73**	**1,227**	**339.57**	**0.52**	**0.52**	0.00
20.00	**0.30**	**802**	**338.90**	**0.38**	**0.38**	0.00
22.00	0.24	515	338.46	0.27	0.27	0.00
24.00	0.23	425	338.31	0.24	0.24	0.00
26.00	0.00	13	337.67	0.00	0.00	0.00
28.00	0.00	5	337.66	0.00	0.00	0.00
30.00	0.00	3	337.65	0.00	0.00	0.00
32.00	0.00	1	337.65	0.00	0.00	0.00
34.00	0.00	1	337.65	0.00	0.00	0.00
36.00	0.00	0	337.65	0.00	0.00	0.00
38.00	0.00	0	337.65	0.00	0.00	0.00
40.00	0.00	0	337.65	0.00	0.00	0.00
42.00	0.00	0	337.65	0.00	0.00	0.00
44.00	0.00	0	337.65	0.00	0.00	0.00
46.00	0.00	0	337.65	0.00	0.00	0.00
48.00	0.00	0	337.65	0.00	0.00	0.00
50.00	0.00	0	337.65	0.00	0.00	0.00
52.00	0.00	0	337.65	0.00	0.00	0.00
54.00	0.00	0	337.65	0.00	0.00	0.00
56.00	0.00	0	337.65	0.00	0.00	0.00
58.00	0.00	0	337.65	0.00	0.00	0.00
60.00	0.00	0	337.65	0.00	0.00	0.00
62.00	0.00	0	337.65	0.00	0.00	0.00
64.00	0.00	0	337.65	0.00	0.00	0.00
66.00	0.00	0	337.65	0.00	0.00	0.00
68.00	0.00	0	337.65	0.00	0.00	0.00
70.00	0.00	0	337.65	0.00	0.00	0.00
72.00	0.00	0	337.65	0.00	0.00	0.00
74.00	0.00	0	337.65	0.00	0.00	0.00
76.00	0.00	0	337.65	0.00	0.00	0.00
78.00	0.00	0	337.65	0.00	0.00	0.00
80.00	0.00	0	337.65	0.00	0.00	0.00
82.00	0.00	0	337.65	0.00	0.00	0.00
84.00	0.00	0	337.65	0.00	0.00	0.00
86.00	0.00	0	337.65	0.00	0.00	0.00

DMA No. 24 & 25 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.24	0.00	0.00	**0.00**
2.00	0.00	0	336.24	0.00	0.00	0.00
4.00	0.00	0	336.24	0.00	0.00	0.00
6.00	0.00	0	336.24	0.00	0.00	0.00
8.00	0.00	0	336.24	0.00	0.00	0.00
10.00	0.00	0	336.24	0.00	0.00	0.00
12.00	0.01	12	336.27	0.00	0.00	0.00
14.00	0.02	28	336.30	0.01	0.01	0.00
16.00	0.03	42	336.33	0.03	0.03	0.00
18.00	**0.08**	**81**	**336.42**	**0.06**	**0.06**	0.00
20.00	**0.04**	**54**	**336.36**	**0.04**	**0.04**	0.00
22.00	0.03	48	336.35	0.03	0.03	0.00
24.00	0.03	48	336.35	0.03	0.03	0.00
26.00	0.00	5	336.25	0.00	0.00	0.00
28.00	0.00	3	336.25	0.00	0.00	0.00
30.00	0.00	2	336.24	0.00	0.00	0.00
32.00	0.00	1	336.24	0.00	0.00	0.00
34.00	0.00	1	336.24	0.00	0.00	0.00
36.00	0.00	0	336.24	0.00	0.00	0.00
38.00	0.00	0	336.24	0.00	0.00	0.00
40.00	0.00	0	336.24	0.00	0.00	0.00
42.00	0.00	0	336.24	0.00	0.00	0.00
44.00	0.00	0	336.24	0.00	0.00	0.00
46.00	0.00	0	336.24	0.00	0.00	0.00
48.00	0.00	0	336.24	0.00	0.00	0.00
50.00	0.00	0	336.24	0.00	0.00	0.00
52.00	0.00	0	336.24	0.00	0.00	0.00
54.00	0.00	0	336.24	0.00	0.00	0.00
56.00	0.00	0	336.24	0.00	0.00	0.00
58.00	0.00	0	336.24	0.00	0.00	0.00
60.00	0.00	0	336.24	0.00	0.00	0.00
62.00	0.00	0	336.24	0.00	0.00	0.00
64.00	0.00	0	336.24	0.00	0.00	0.00
66.00	0.00	0	336.24	0.00	0.00	0.00
68.00	0.00	0	336.24	0.00	0.00	0.00
70.00	0.00	0	336.24	0.00	0.00	0.00
72.00	0.00	0	336.24	0.00	0.00	0.00
74.00	0.00	0	336.24	0.00	0.00	0.00
76.00	0.00	0	336.24	0.00	0.00	0.00
78.00	0.00	0	336.24	0.00	0.00	0.00
80.00	0.00	0	336.24	0.00	0.00	0.00
82.00	0.00	0	336.24	0.00	0.00	0.00
84.00	0.00	0	336.24	0.00	0.00	0.00
86.00	0.00	0	336.24	0.00	0.00	0.00

DMA No. 24 & 25 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.24	0.00	0.00	**0.00**
2.00	0.00	0	336.24	0.00	0.00	0.00
4.00	0.00	0	336.24	0.00	0.00	0.00
6.00	0.09	98	336.45	0.08	0.08	0.00
8.00	0.13	168	336.61	0.11	0.11	0.00
10.00	0.15	273	336.84	0.15	0.15	0.00
12.00	0.18	317	336.93	0.16	0.16	0.00
14.00	0.29	526	337.39	0.22	0.22	0.00
16.00	0.37	841	338.08	0.28	0.28	0.00
18.00	**0.70**	**1,851**	**339.46**	**0.37**	**0.37**	0.00
20.00	**0.29**	**2,111**	**339.73**	**0.39**	**0.39**	0.00
22.00	0.24	1,348	338.86	0.33	0.33	0.00
24.00	0.22	815	338.03	0.27	0.27	0.00
26.00	0.00	22	336.29	0.01	0.01	0.00
28.00	0.00	4	336.25	0.00	0.00	0.00
30.00	0.00	2	336.25	0.00	0.00	0.00
32.00	0.00	1	336.24	0.00	0.00	0.00
34.00	0.00	1	336.24	0.00	0.00	0.00
36.00	0.00	0	336.24	0.00	0.00	0.00
38.00	0.00	0	336.24	0.00	0.00	0.00
40.00	0.00	0	336.24	0.00	0.00	0.00
42.00	0.00	0	336.24	0.00	0.00	0.00
44.00	0.00	0	336.24	0.00	0.00	0.00
46.00	0.00	0	336.24	0.00	0.00	0.00
48.00	0.00	0	336.24	0.00	0.00	0.00
50.00	0.00	0	336.24	0.00	0.00	0.00
52.00	0.00	0	336.24	0.00	0.00	0.00
54.00	0.00	0	336.24	0.00	0.00	0.00
56.00	0.00	0	336.24	0.00	0.00	0.00
58.00	0.00	0	336.24	0.00	0.00	0.00
60.00	0.00	0	336.24	0.00	0.00	0.00
62.00	0.00	0	336.24	0.00	0.00	0.00
64.00	0.00	0	336.24	0.00	0.00	0.00
66.00	0.00	0	336.24	0.00	0.00	0.00
68.00	0.00	0	336.24	0.00	0.00	0.00
70.00	0.00	0	336.24	0.00	0.00	0.00
72.00	0.00	0	336.24	0.00	0.00	0.00
74.00	0.00	0	336.24	0.00	0.00	0.00
76.00	0.00	0	336.24	0.00	0.00	0.00
78.00	0.00	0	336.24	0.00	0.00	0.00
80.00	0.00	0	336.24	0.00	0.00	0.00
82.00	0.00	0	336.24	0.00	0.00	0.00
84.00	0.00	0	336.24	0.00	0.00	0.00
86.00	0.00	0	336.24	0.00	0.00	0.00

DMA No. 26 & 27 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.24	0.00	0.00	**0.00**
2.00	0.00	0	337.24	0.00	0.00	0.00
4.00	0.00	0	337.24	0.00	0.00	0.00
6.00	0.00	0	337.24	0.00	0.00	0.00
8.00	0.00	0	337.24	0.00	0.00	0.00
10.00	0.00	2	337.24	0.00	0.00	0.00
12.00	0.01	19	337.27	0.01	0.01	0.00
14.00	0.02	39	337.31	0.02	0.02	0.00
16.00	0.04	55	337.34	0.03	0.03	0.00
18.00	**0.09**	**105**	**337.43**	**0.07**	**0.07**	0.00
20.00	**0.04**	**73**	**337.37**	**0.05**	**0.05**	0.00
22.00	0.04	63	337.35	0.04	0.04	0.00
24.00	0.04	63	337.35	0.04	0.04	0.00
26.00	0.00	9	337.26	0.00	0.00	0.00
28.00	0.00	4	337.25	0.00	0.00	0.00
30.00	0.00	3	337.24	0.00	0.00	0.00
32.00	0.00	2	337.24	0.00	0.00	0.00
34.00	0.00	1	337.24	0.00	0.00	0.00
36.00	0.00	1	337.24	0.00	0.00	0.00
38.00	0.00	0	337.24	0.00	0.00	0.00
40.00	0.00	0	337.24	0.00	0.00	0.00
42.00	0.00	0	337.24	0.00	0.00	0.00
44.00	0.00	0	337.24	0.00	0.00	0.00
46.00	0.00	0	337.24	0.00	0.00	0.00
48.00	0.00	0	337.24	0.00	0.00	0.00
50.00	0.00	0	337.24	0.00	0.00	0.00
52.00	0.00	0	337.24	0.00	0.00	0.00
54.00	0.00	0	337.24	0.00	0.00	0.00
56.00	0.00	0	337.24	0.00	0.00	0.00
58.00	0.00	0	337.24	0.00	0.00	0.00
60.00	0.00	0	337.24	0.00	0.00	0.00
62.00	0.00	0	337.24	0.00	0.00	0.00
64.00	0.00	0	337.24	0.00	0.00	0.00
66.00	0.00	0	337.24	0.00	0.00	0.00
68.00	0.00	0	337.24	0.00	0.00	0.00
70.00	0.00	0	337.24	0.00	0.00	0.00
72.00	0.00	0	337.24	0.00	0.00	0.00
74.00	0.00	0	337.24	0.00	0.00	0.00
76.00	0.00	0	337.24	0.00	0.00	0.00
78.00	0.00	0	337.24	0.00	0.00	0.00
80.00	0.00	0	337.24	0.00	0.00	0.00
82.00	0.00	0	337.24	0.00	0.00	0.00
84.00	0.00	0	337.24	0.00	0.00	0.00
86.00	0.00	0	337.24	0.00	0.00	0.00

DMA No. 26 & 27 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.24	0.00	0.00	**0.00**
2.00	0.00	0	337.24	0.00	0.00	0.00
4.00	0.01	2	337.24	0.00	0.00	0.00
6.00	0.10	133	337.48	0.08	0.08	0.00
8.00	0.14	227	337.65	0.12	0.12	0.00
10.00	0.17	370	337.91	0.16	0.16	0.00
12.00	0.19	428	338.02	0.17	0.17	0.00
14.00	0.31	679	338.47	0.22	0.22	0.00
16.00	0.39	1,078	339.19	0.29	0.29	0.00
18.00	**0.74**	**1,233**	**340.10**	**0.74**	**0.74**	0.00
20.00	**0.30**	**1,113**	**339.30**	**0.31**	**0.31**	0.00
22.00	0.25	992	339.04	0.28	0.28	0.00
24.00	0.24	849	338.78	0.25	0.25	0.00
26.00	0.00	39	337.31	0.02	0.02	0.00
28.00	0.00	7	337.25	0.00	0.00	0.00
30.00	0.00	4	337.25	0.00	0.00	0.00
32.00	0.00	2	337.24	0.00	0.00	0.00
34.00	0.00	2	337.24	0.00	0.00	0.00
36.00	0.00	1	337.24	0.00	0.00	0.00
38.00	0.00	1	337.24	0.00	0.00	0.00
40.00	0.00	0	337.24	0.00	0.00	0.00
42.00	0.00	0	337.24	0.00	0.00	0.00
44.00	0.00	0	337.24	0.00	0.00	0.00
46.00	0.00	0	337.24	0.00	0.00	0.00
48.00	0.00	0	337.24	0.00	0.00	0.00
50.00	0.00	0	337.24	0.00	0.00	0.00
52.00	0.00	0	337.24	0.00	0.00	0.00
54.00	0.00	0	337.24	0.00	0.00	0.00
56.00	0.00	0	337.24	0.00	0.00	0.00
58.00	0.00	0	337.24	0.00	0.00	0.00
60.00	0.00	0	337.24	0.00	0.00	0.00
62.00	0.00	0	337.24	0.00	0.00	0.00
64.00	0.00	0	337.24	0.00	0.00	0.00
66.00	0.00	0	337.24	0.00	0.00	0.00
68.00	0.00	0	337.24	0.00	0.00	0.00
70.00	0.00	0	337.24	0.00	0.00	0.00
72.00	0.00	0	337.24	0.00	0.00	0.00
74.00	0.00	0	337.24	0.00	0.00	0.00
76.00	0.00	0	337.24	0.00	0.00	0.00
78.00	0.00	0	337.24	0.00	0.00	0.00
80.00	0.00	0	337.24	0.00	0.00	0.00
82.00	0.00	0	337.24	0.00	0.00	0.00
84.00	0.00	0	337.24	0.00	0.00	0.00
86.00	0.00	0	337.24	0.00	0.00	0.00

DMA No. 28 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.73	0.00	0.00	**0.00**
2.00	0.00	0	335.73	0.00	0.00	0.00
4.00	0.00	0	335.73	0.00	0.00	0.00
6.00	0.00	3	335.73	0.00	0.00	0.00
8.00	0.02	56	335.78	0.00	0.00	0.00
10.00	0.02	126	335.84	0.02	0.02	0.00
12.00	0.03	167	335.88	0.03	0.03	0.00
14.00	0.06	239	335.94	0.04	0.04	0.00
16.00	0.08	359	336.05	0.05	0.05	0.00
18.00	**0.17**	**672**	**336.32**	**0.07**	**0.07**	0.00
20.00	**0.07**	**833**	**336.46**	**0.08**	**0.08**	0.00
22.00	0.06	693	336.34	0.08	0.08	0.00
24.00	0.05	578	336.24	0.07	0.07	0.00
26.00	0.00	227	335.93	0.04	0.04	0.00
28.00	0.00	83	335.80	0.01	0.01	0.00
30.00	0.00	45	335.77	0.00	0.00	0.00
32.00	0.00	27	335.75	0.00	0.00	0.00
34.00	0.00	18	335.75	0.00	0.00	0.00
36.00	0.00	14	335.74	0.00	0.00	0.00
38.00	0.00	12	335.74	0.00	0.00	0.00
40.00	0.00	10	335.74	0.00	0.00	0.00
42.00	0.00	9	335.74	0.00	0.00	0.00
44.00	0.00	8	335.74	0.00	0.00	0.00
46.00	0.00	7	335.74	0.00	0.00	0.00
48.00	0.00	6	335.74	0.00	0.00	0.00
50.00	0.00	6	335.74	0.00	0.00	0.00
52.00	0.00	5	335.73	0.00	0.00	0.00
54.00	0.00	5	335.73	0.00	0.00	0.00
56.00	0.00	4	335.73	0.00	0.00	0.00
58.00	0.00	4	335.73	0.00	0.00	0.00
60.00	0.00	3	335.73	0.00	0.00	0.00
62.00	0.00	3	335.73	0.00	0.00	0.00
64.00	0.00	3	335.73	0.00	0.00	0.00
66.00	0.00	2	335.73	0.00	0.00	0.00
68.00	0.00	2	335.73	0.00	0.00	0.00
70.00	0.00	2	335.73	0.00	0.00	0.00
72.00	0.00	2	335.73	0.00	0.00	0.00
74.00	0.00	1	335.73	0.00	0.00	0.00
76.00	0.00	1	335.73	0.00	0.00	0.00
78.00	0.00	1	335.73	0.00	0.00	0.00
80.00	0.00	1	335.73	0.00	0.00	0.00
82.00	0.00	1	335.73	0.00	0.00	0.00
84.00	0.00	1	335.73	0.00	0.00	0.00
86.00	0.00	1	335.73	0.00	0.00	0.00

DMA No. 28 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.73	0.00	0.00	**0.00**
2.00	0.00	0	335.73	0.00	0.00	0.00
4.00	0.09	184	335.89	0.03	0.03	0.00
6.00	0.20	917	336.53	0.09	0.09	0.00
8.00	0.24	1,355	336.92	0.17	0.17	0.00
10.00	0.24	1,735	337.25	0.21	0.21	0.00
12.00	0.26	1,894	337.39	0.23	0.23	0.00
14.00	0.41	2,345	337.96	0.28	0.28	0.00
16.00	0.49	2,774	339.46	0.38	0.38	0.00
18.00	**0.91**	**4,071**	**340.12**	**0.66**	**0.66**	0.00
20.00	**0.35**	**3,646**	**340.00**	**0.41**	**0.41**	0.00
22.00	0.28	2,963	339.78	0.40	0.40	0.00
24.00	0.27	2,443	338.30	0.30	0.30	0.00
26.00	0.00	1,081	336.68	0.13	0.13	0.00
28.00	0.00	487	336.16	0.06	0.06	0.00
30.00	0.00	170	335.88	0.03	0.03	0.00
32.00	0.00	70	335.79	0.01	0.01	0.00
34.00	0.00	39	335.76	0.00	0.00	0.00
36.00	0.00	24	335.75	0.00	0.00	0.00
38.00	0.00	16	335.74	0.00	0.00	0.00
40.00	0.00	13	335.74	0.00	0.00	0.00
42.00	0.00	11	335.74	0.00	0.00	0.00
44.00	0.00	10	335.74	0.00	0.00	0.00
46.00	0.00	9	335.74	0.00	0.00	0.00
48.00	0.00	8	335.74	0.00	0.00	0.00
50.00	0.00	7	335.74	0.00	0.00	0.00
52.00	0.00	6	335.74	0.00	0.00	0.00
54.00	0.00	6	335.73	0.00	0.00	0.00
56.00	0.00	5	335.73	0.00	0.00	0.00
58.00	0.00	4	335.73	0.00	0.00	0.00
60.00	0.00	4	335.73	0.00	0.00	0.00
62.00	0.00	4	335.73	0.00	0.00	0.00
64.00	0.00	3	335.73	0.00	0.00	0.00
66.00	0.00	3	335.73	0.00	0.00	0.00
68.00	0.00	3	335.73	0.00	0.00	0.00
70.00	0.00	2	335.73	0.00	0.00	0.00
72.00	0.00	2	335.73	0.00	0.00	0.00
74.00	0.00	2	335.73	0.00	0.00	0.00
76.00	0.00	2	335.73	0.00	0.00	0.00
78.00	0.00	1	335.73	0.00	0.00	0.00
80.00	0.00	1	335.73	0.00	0.00	0.00
82.00	0.00	1	335.73	0.00	0.00	0.00
84.00	0.00	1	335.73	0.00	0.00	0.00
86.00	0.00	1	335.73	0.00	0.00	0.00

DMA No. 29 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.73	0.00	0.00	**0.00**
2.00	0.00	0	336.73	0.00	0.00	0.00
4.00	0.00	0	336.73	0.00	0.00	0.00
6.00	0.00	0	336.73	0.00	0.00	0.00
8.00	0.00	7	336.75	0.00	0.00	0.00
10.00	0.01	14	336.77	0.00	0.00	0.00
12.00	0.01	18	336.78	0.01	0.01	0.00
14.00	0.01	27	336.81	0.01	0.01	0.00
16.00	0.02	39	336.84	0.01	0.01	0.00
18.00	**0.04**	**77**	**336.96**	**0.02**	**0.02**	0.00
20.00	**0.02**	**84**	**336.98**	**0.02**	**0.02**	0.00
22.00	0.01	48	336.87	0.02	0.02	0.00
24.00	0.01	38	336.84	0.01	0.01	0.00
26.00	0.00	6	336.75	0.00	0.00	0.00
28.00	0.00	3	336.74	0.00	0.00	0.00
30.00	0.00	2	336.73	0.00	0.00	0.00
32.00	0.00	1	336.73	0.00	0.00	0.00
34.00	0.00	1	336.73	0.00	0.00	0.00
36.00	0.00	0	336.73	0.00	0.00	0.00
38.00	0.00	0	336.73	0.00	0.00	0.00
40.00	0.00	0	336.73	0.00	0.00	0.00
42.00	0.00	0	336.73	0.00	0.00	0.00
44.00	0.00	0	336.73	0.00	0.00	0.00
46.00	0.00	0	336.73	0.00	0.00	0.00
48.00	0.00	0	336.73	0.00	0.00	0.00
50.00	0.00	0	336.73	0.00	0.00	0.00
52.00	0.00	0	336.73	0.00	0.00	0.00
54.00	0.00	0	336.73	0.00	0.00	0.00
56.00	0.00	0	336.73	0.00	0.00	0.00
58.00	0.00	0	336.73	0.00	0.00	0.00
60.00	0.00	0	336.73	0.00	0.00	0.00
62.00	0.00	0	336.73	0.00	0.00	0.00
64.00	0.00	0	336.73	0.00	0.00	0.00
66.00	0.00	0	336.73	0.00	0.00	0.00
68.00	0.00	0	336.73	0.00	0.00	0.00
70.00	0.00	0	336.73	0.00	0.00	0.00
72.00	0.00	0	336.73	0.00	0.00	0.00
74.00	0.00	0	336.73	0.00	0.00	0.00
76.00	0.00	0	336.73	0.00	0.00	0.00
78.00	0.00	0	336.73	0.00	0.00	0.00
80.00	0.00	0	336.73	0.00	0.00	0.00
82.00	0.00	0	336.73	0.00	0.00	0.00
84.00	0.00	0	336.73	0.00	0.00	0.00
86.00	0.00	0	336.73	0.00	0.00	0.00

DMA No. 29 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.73	0.00	0.00	**0.00**
2.00	0.00	0	336.73	0.00	0.00	0.00
4.00	0.02	23	336.80	0.01	0.01	0.00
6.00	0.05	130	337.11	0.03	0.03	0.00
8.00	0.05	213	337.36	0.04	0.04	0.00
10.00	0.06	290	337.58	0.06	0.06	0.00
12.00	0.06	294	337.60	0.06	0.06	0.00
14.00	0.09	342	337.74	0.07	0.07	0.00
16.00	0.11	419	337.96	0.09	0.09	0.00
18.00	**0.21**	**662**	**338.68**	**0.13**	**0.13**	0.00
20.00	**0.09**	**625**	**338.57**	**0.12**	**0.12**	0.00
22.00	0.07	416	337.95	0.09	0.09	0.00
24.00	0.07	334	337.71	0.07	0.07	0.00
26.00	0.00	91	337.00	0.02	0.02	0.00
28.00	0.00	9	336.76	0.00	0.00	0.00
30.00	0.00	3	336.74	0.00	0.00	0.00
32.00	0.00	2	336.74	0.00	0.00	0.00
34.00	0.00	1	336.73	0.00	0.00	0.00
36.00	0.00	1	336.73	0.00	0.00	0.00
38.00	0.00	0	336.73	0.00	0.00	0.00
40.00	0.00	0	336.73	0.00	0.00	0.00
42.00	0.00	0	336.73	0.00	0.00	0.00
44.00	0.00	0	336.73	0.00	0.00	0.00
46.00	0.00	0	336.73	0.00	0.00	0.00
48.00	0.00	0	336.73	0.00	0.00	0.00
50.00	0.00	0	336.73	0.00	0.00	0.00
52.00	0.00	0	336.73	0.00	0.00	0.00
54.00	0.00	0	336.73	0.00	0.00	0.00
56.00	0.00	0	336.73	0.00	0.00	0.00
58.00	0.00	0	336.73	0.00	0.00	0.00
60.00	0.00	0	336.73	0.00	0.00	0.00
62.00	0.00	0	336.73	0.00	0.00	0.00
64.00	0.00	0	336.73	0.00	0.00	0.00
66.00	0.00	0	336.73	0.00	0.00	0.00
68.00	0.00	0	336.73	0.00	0.00	0.00
70.00	0.00	0	336.73	0.00	0.00	0.00
72.00	0.00	0	336.73	0.00	0.00	0.00
74.00	0.00	0	336.73	0.00	0.00	0.00
76.00	0.00	0	336.73	0.00	0.00	0.00
78.00	0.00	0	336.73	0.00	0.00	0.00
80.00	0.00	0	336.73	0.00	0.00	0.00
82.00	0.00	0	336.73	0.00	0.00	0.00
84.00	0.00	0	336.73	0.00	0.00	0.00
86.00	0.00	0	336.73	0.00	0.00	0.00

DMA No. 30 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.71	0.00	0.00	**0.00**
2.00	0.00	0	336.71	0.00	0.00	0.00
4.00	0.00	0	336.71	0.00	0.00	0.00
6.00	0.00	0	336.71	0.00	0.00	0.00
8.00	0.00	11	336.74	0.00	0.00	0.00
10.00	0.01	22	336.77	0.00	0.00	0.00
12.00	0.01	26	336.78	0.01	0.01	0.00
14.00	0.01	34	336.80	0.01	0.01	0.00
16.00	0.02	43	336.82	0.02	0.02	0.00
18.00	**0.04**	**78**	**336.92**	**0.03**	**0.03**	0.00
20.00	**0.02**	**58**	**336.86**	**0.02**	**0.02**	0.00
22.00	0.01	40	336.82	0.02	0.02	0.00
24.00	0.01	38	336.81	0.01	0.01	0.00
26.00	0.00	10	336.74	0.00	0.00	0.00
28.00	0.00	8	336.73	0.00	0.00	0.00
30.00	0.00	8	336.73	0.00	0.00	0.00
32.00	0.00	8	336.73	0.00	0.00	0.00
34.00	0.00	8	336.73	0.00	0.00	0.00
36.00	0.00	8	336.73	0.00	0.00	0.00
38.00	0.00	8	336.73	0.00	0.00	0.00
40.00	0.00	8	336.73	0.00	0.00	0.00
42.00	0.00	8	336.73	0.00	0.00	0.00
44.00	0.00	8	336.73	0.00	0.00	0.00
46.00	0.00	8	336.73	0.00	0.00	0.00
48.00	0.00	8	336.73	0.00	0.00	0.00
50.00	0.00	8	336.73	0.00	0.00	0.00
52.00	0.00	8	336.73	0.00	0.00	0.00
54.00	0.00	8	336.73	0.00	0.00	0.00
56.00	0.00	8	336.73	0.00	0.00	0.00
58.00	0.00	8	336.73	0.00	0.00	0.00
60.00	0.00	8	336.73	0.00	0.00	0.00
62.00	0.00	8	336.73	0.00	0.00	0.00
64.00	0.00	8	336.73	0.00	0.00	0.00
66.00	0.00	8	336.73	0.00	0.00	0.00
68.00	0.00	8	336.73	0.00	0.00	0.00
70.00	0.00	8	336.73	0.00	0.00	0.00
72.00	0.00	8	336.73	0.00	0.00	0.00
74.00	0.00	8	336.73	0.00	0.00	0.00
76.00	0.00	8	336.73	0.00	0.00	0.00
78.00	0.00	8	336.73	0.00	0.00	0.00
80.00	0.00	8	336.73	0.00	0.00	0.00
82.00	0.00	8	336.73	0.00	0.00	0.00
84.00	0.00	8	336.73	0.00	0.00	0.00
86.00	0.00	8	336.73	0.00	0.00	0.00

DMA No. 30 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.71	0.00	0.00	**0.00**
2.00	0.00	0	336.71	0.00	0.00	0.00
4.00	0.02	34	336.80	0.01	0.01	0.00
6.00	0.05	126	337.04	0.04	0.04	0.00
8.00	0.06	178	337.18	0.05	0.05	0.00
10.00	0.06	247	337.36	0.06	0.06	0.00
12.00	0.07	269	337.42	0.06	0.06	0.00
14.00	0.11	344	337.62	0.09	0.09	0.00
16.00	0.13	386	337.72	0.11	0.11	0.00
18.00	**0.25**	**607**	**338.31**	**0.17**	**0.17**	0.00
20.00	**0.09**	**481**	**337.98**	**0.14**	**0.14**	0.00
22.00	0.08	326	337.57	0.08	0.08	0.00
24.00	0.07	314	337.54	0.07	0.07	0.00
26.00	0.00	37	336.81	0.01	0.01	0.00
28.00	0.00	10	336.74	0.00	0.00	0.00
30.00	0.00	8	336.73	0.00	0.00	0.00
32.00	0.00	8	336.73	0.00	0.00	0.00
34.00	0.00	8	336.73	0.00	0.00	0.00
36.00	0.00	8	336.73	0.00	0.00	0.00
38.00	0.00	8	336.73	0.00	0.00	0.00
40.00	0.00	8	336.73	0.00	0.00	0.00
42.00	0.00	8	336.73	0.00	0.00	0.00
44.00	0.00	8	336.73	0.00	0.00	0.00
46.00	0.00	8	336.73	0.00	0.00	0.00
48.00	0.00	8	336.73	0.00	0.00	0.00
50.00	0.00	8	336.73	0.00	0.00	0.00
52.00	0.00	8	336.73	0.00	0.00	0.00
54.00	0.00	8	336.73	0.00	0.00	0.00
56.00	0.00	8	336.73	0.00	0.00	0.00
58.00	0.00	8	336.73	0.00	0.00	0.00
60.00	0.00	8	336.73	0.00	0.00	0.00
62.00	0.00	8	336.73	0.00	0.00	0.00
64.00	0.00	8	336.73	0.00	0.00	0.00
66.00	0.00	8	336.73	0.00	0.00	0.00
68.00	0.00	8	336.73	0.00	0.00	0.00
70.00	0.00	8	336.73	0.00	0.00	0.00
72.00	0.00	8	336.73	0.00	0.00	0.00
74.00	0.00	8	336.73	0.00	0.00	0.00
76.00	0.00	8	336.73	0.00	0.00	0.00
78.00	0.00	8	336.73	0.00	0.00	0.00
80.00	0.00	8	336.73	0.00	0.00	0.00
82.00	0.00	8	336.73	0.00	0.00	0.00
84.00	0.00	8	336.73	0.00	0.00	0.00
86.00	0.00	8	336.73	0.00	0.00	0.00

Outfall discharge Calculations

Total Pre-development

Events for Subcatchment 1S: Project Pre Development

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	1.96	0.848	0.64
1 year	2.21	2.63	1.188	0.90
2 year	2.90	3.99	1.902	1.43
5 year	3.84	5.87	2.958	2.23
10 year	4.62	7.44	3.879	2.92
25 year	5.72	9.65	5.219	3.94
50 year	6.59	11.39	6.301	4.75
100 year	**7.49**	**13.19**	**7.435**	**5.61**

Total Post Development

Events for Subcatchment 2S: DMA 1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	1.49	0.580	0.44
1 year	2.21	2.12	0.861	0.65
2 year	2.90	3.43	1.480	1.12
5 year	3.84	5.31	2.433	1.83
10 year	4.62	6.92	3.286	2.48
25 year	5.72	9.20	4.550	3.43
50 year	6.59	11.00	5.584	4.21
100 year	**7.49**	**12.87**	**6.677**	**5.03**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	1.49	1.19	1.19	**0.00**	335.92	1,016
1 year	2.12	1.66	1.66	0.00	336.04	2,335
2 year	3.43	2.79	2.79	0.00	336.27	5,027
5 year	5.31	4.41	4.41	0.00	336.57	8,551
10 year	6.92	5.71	5.71	0.00	336.83	11,537
25 year	9.20	6.84	6.84	0.00	337.29	17,007
50 year	11.00	7.09	7.09	0.00	338.29	24,573
100 year	**12.87**	**8.11**	**8.11**	0.00	**339.93**	**31,768**

Printable Title

Printable Subtitle

Set units: m mm ft in [Hide this line]

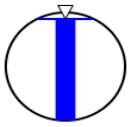
Inputs

Pipe diameter, d_0	1.5	ft	X
Manning roughness, n	0.011		X
Pressure slope (possibly ? equal to pipe slope), S_0	0.0035	rise/run	X
Percent of (or ratio to) full depth (100% or 1 if flowing full)	94	%	X

Results

Flow, Q (See notes)	7.8996	cfs	X
Velocity, v	4.5826	ft/sec	X
Velocity head, h_v	0.3264	ft H2O	X
Flow area	1.7239	ft^2	X
Wetted perimeter	3.9700	ft	X
Hydraulic radius	0.4342	ft	X
Top width, T	0.7125	ft	X
Froude number, F	0.52		X
Average shear stress (tractive force), tau	0.0949	psf	X

Printable version (reload/refresh to restore)



The 18" Storm drain pipe is good to handle up to
50 year storm event at 7.09 cfs < pipe capacity 7.9 cfs Ok.

Summary for Subcatchment 2S: DMA 1

Runoff = 12.87 cfs @ 18.14 hrs, Volume= 6.677 af, Depth= 5.03"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
693,210	79	1 acre lots, 20% imp, HSG C
554,568		80.00% Pervious Area
138,642		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment 1S: Project Pre Development

Runoff = 13.59 cfs @ 18.14 hrs, Volume= 7.435 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
693,210	84	50-75% Grass cover, Fair, HSG D
693,210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct**

Summary for Pond 3P: Bioretention Pond

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 15.914 ac, 20.00% Impervious, Inflow Depth = 5.03" for 100 year event
Inflow = 12.87 cfs @ 18.14 hrs, Volume= 6.677 af
Outflow = 8.11 cfs @ 18.80 hrs, Volume= 6.677 af, Atten= 37%, Lag= 39.4 min
Primary = 8.11 cfs @ 18.80 hrs, Volume= 6.677 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 339.93' @ 18.80 hrs Surf.Area= 29,343 sf Storage= 31,768 cf

Plug-Flow detention time= 38.2 min calculated for 6.677 af (100% of inflow)
Center-of-Mass det. time= 38.2 min (1,012.4 - 974.1)

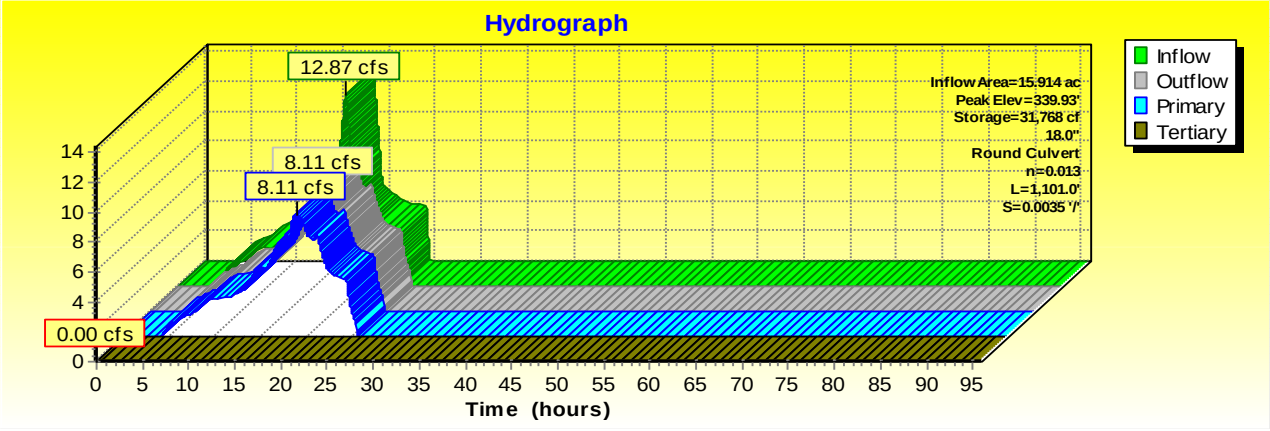
Volume	Invert	Avail.Storage	Storage Description
#1	335.83'	74,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
335.83	0	0.0	0	0
335.84	29,130	40.0	58	58
337.83	29,130	40.0	23,187	23,246
337.84	29,130	10.0	29	23,275
339.83	29,130	10.0	5,797	29,072
339.84	29,130	10.0	29	29,101
340.33	30,276	100.0	14,554	43,655
340.83	31,329	100.0	15,401	59,057
341.33	32,400	100.0	15,932	74,989

Device	Routing	Invert	Outlet Devices
#0	Tertiary	341.33'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	335.33'	**18.0" Round Culvert** L= 1,101.0' Ke= 0.200 Inlet / Outlet Invert= 335.33' / 331.45' S= 0.0035 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.11 cfs @ 18.80 hrs HW=339.93' (Free Discharge)
1=Culvert (Barrel Controls 8.11 cfs @ 4.59 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=335.83' (Free Discharge)

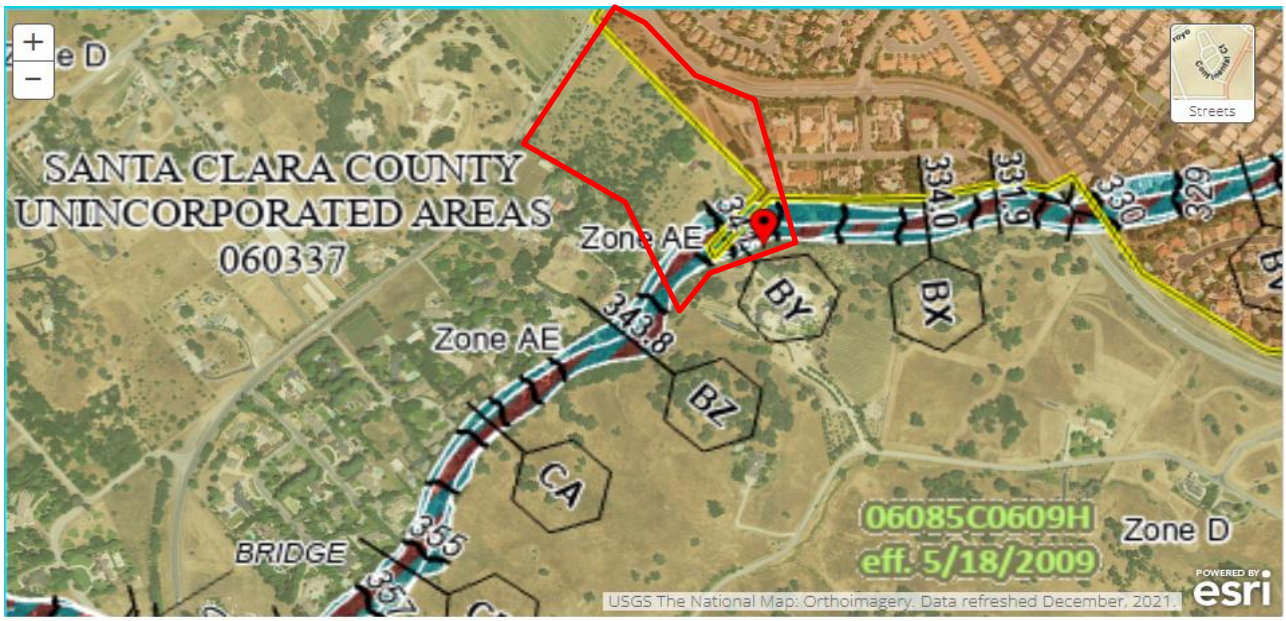


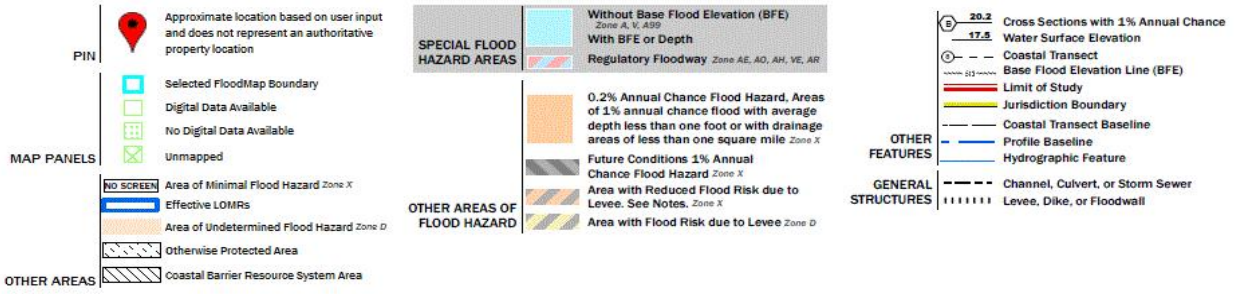
Drawdown timeduring 100 year storm

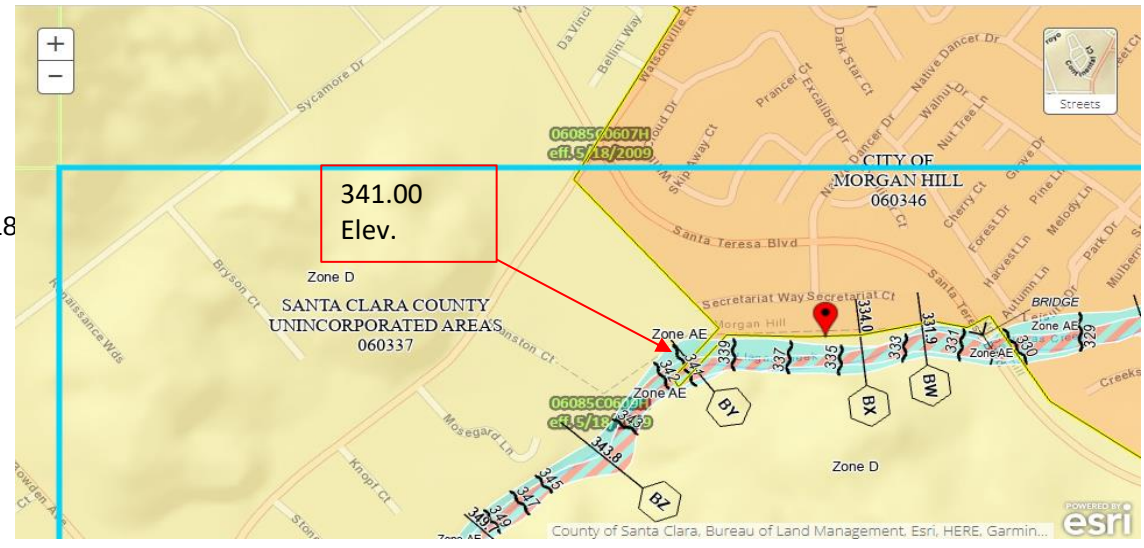
Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.83	0.00	0.00	**0.00**
2.00	0.00	0	335.83	0.00	0.00	0.00
4.00	0.05	3	335.83	0.04	0.04	0.00
6.00	1.45	938	335.92	1.17	1.17	0.00
8.00	2.23	2,798	336.08	1.84	1.84	0.00
10.00	2.55	4,480	336.22	2.54	2.54	0.00
12.00	3.02	5,085	336.27	2.81	2.81	0.00
14.00	5.02	7,857	336.51	4.09	4.09	0.00
16.00	6.34	10,379	336.73	5.23	5.23	0.00
18.00	**12.22**	**22,378**	**337.76**	**6.73**	**6.73**	0.00
20.00	**4.73**	**22,499**	**337.77**	**6.74**	**6.74**	0.00
22.00	3.91	9,115	336.62	4.67	4.67	0.00
24.00	3.74	7,315	336.46	3.83	3.83	0.00
26.00	0.00	0	335.83	0.00	0.00	0.00
28.00	0.00	0	335.83	0.00	0.00	0.00
30.00	0.00	0	335.83	0.00	0.00	0.00
32.00	0.00	0	335.83	0.00	0.00	0.00
34.00	0.00	0	335.83	0.00	0.00	0.00
36.00	0.00	0	335.83	0.00	0.00	0.00
38.00	0.00	0	335.83	0.00	0.00	0.00
40.00	0.00	0	335.83	0.00	0.00	0.00
42.00	0.00	0	335.83	0.00	0.00	0.00
44.00	0.00	0	335.83	0.00	0.00	0.00
46.00	0.00	0	335.83	0.00	0.00	0.00
48.00	0.00	0	335.83	0.00	0.00	0.00
50.00	0.00	0	335.83	0.00	0.00	0.00
52.00	0.00	0	335.83	0.00	0.00	0.00
54.00	0.00	0	335.83	0.00	0.00	0.00
56.00	0.00	0	335.83	0.00	0.00	0.00
58.00	0.00	0	335.83	0.00	0.00	0.00
60.00	0.00	0	335.83	0.00	0.00	0.00
62.00	0.00	0	335.83	0.00	0.00	0.00
64.00	0.00	0	335.83	0.00	0.00	0.00
66.00	0.00	0	335.83	0.00	0.00	0.00
68.00	0.00	0	335.83	0.00	0.00	0.00
70.00	0.00	0	335.83	0.00	0.00	0.00
72.00	0.00	0	335.83	0.00	0.00	0.00
74.00	0.00	0	335.83	0.00	0.00	0.00
76.00	0.00	0	335.83	0.00	0.00	0.00
78.00	0.00	0	335.83	0.00	0.00	0.00
80.00	0.00	0	335.83	0.00	0.00	0.00
82.00	0.00	0	335.83	0.00	0.00	0.00
84.00	0.00	0	335.83	0.00	0.00	0.00
86.00	0.00	0	335.83	0.00	0.00	0.00
88.00	0.00	0	335.83	0.00	0.00	0.00
90.00	0.00	0	335.83	0.00	0.00	0.00
92.00	0.00	0	335.83	0.00	0.00	0.00
94.00	0.00	0	335.83	0.00	0.00	0.00
96.00	0.00	0	335.83	0.00	0.00	0.00

FEMA Map No. 06085C0609H
Eff. 5 18, 2009





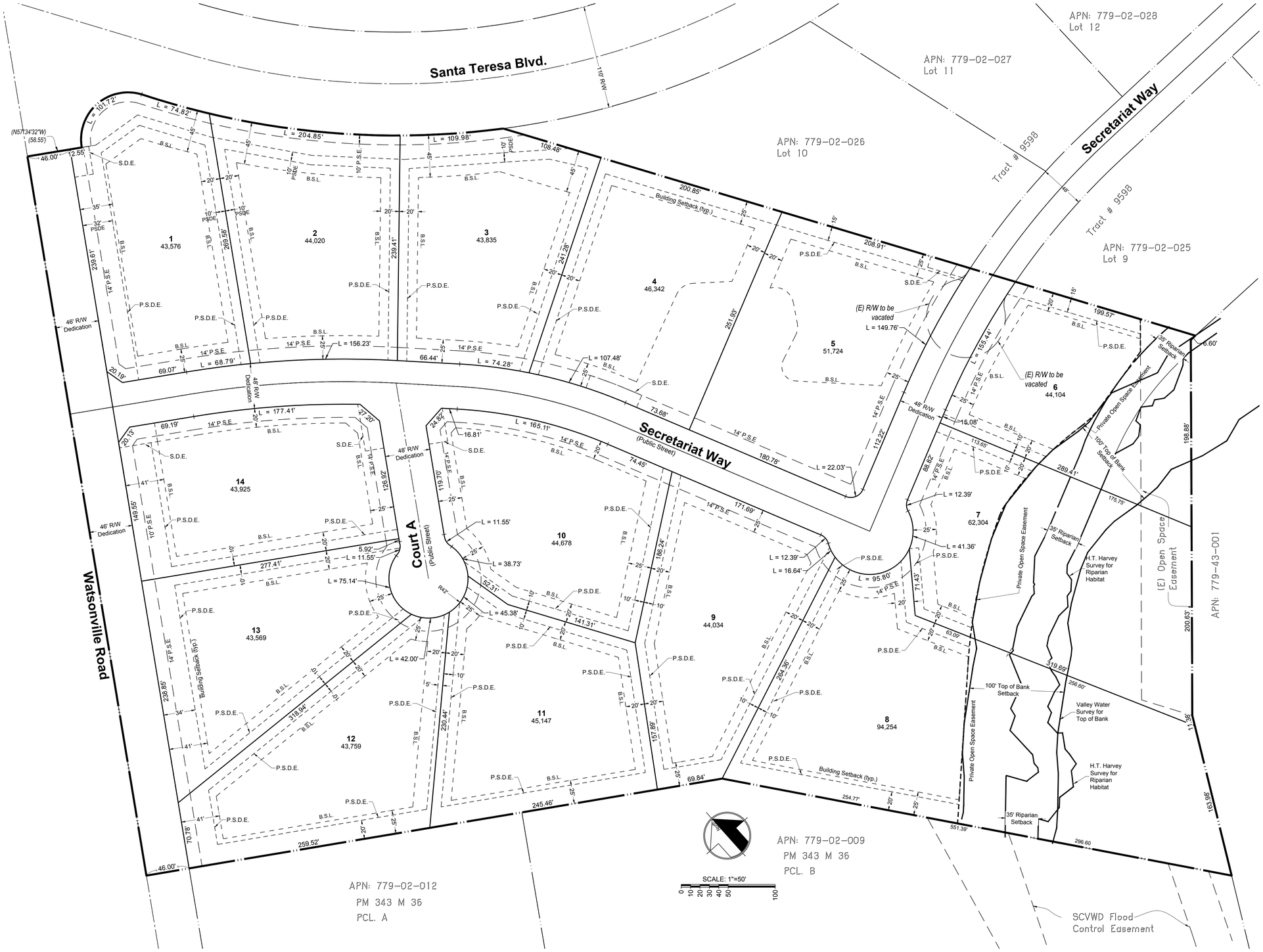


18

The projected flood elevation falls at cross section BY at Elev. 341.00 Llagas Creek 100 yr. water elevation. All building pads are established at 343.85 being 2.85 feet above the 100 year flood event.

MH engineering Co.
16075 Vineyard Blvd. Morgan Hill, CA 95037 - (408) 779-7381

Attachment G: Stormwater Management Plan & Details



quail vineyards

tentative map

Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1/PD
PROPOSED ZONING:	RE-1/PD
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

Density Calcs:

TOTAL PROJECT AREA:	18.540 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	16.111 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement
B.S.L.	Building Setback Line

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 05/21/2023 DRAWN:RS CHECKED: WJM

Sheet **1** of **6**
25268.2

Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement

Abbreviations:

APN- ASSESSOR PARCEL NUMBER
EX- EXISTING
TBR- TO BE REMOVED

Building Coverage Calcs:

PROJECT NET AREA:	14.878	ACRES
BUILDING COVERAGE:	1.151	ACRES
% BUILDING COVERAGE:	7.73%	

Density Calcs:

TOTAL PROJECT AREA:	18.390 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	14.878 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

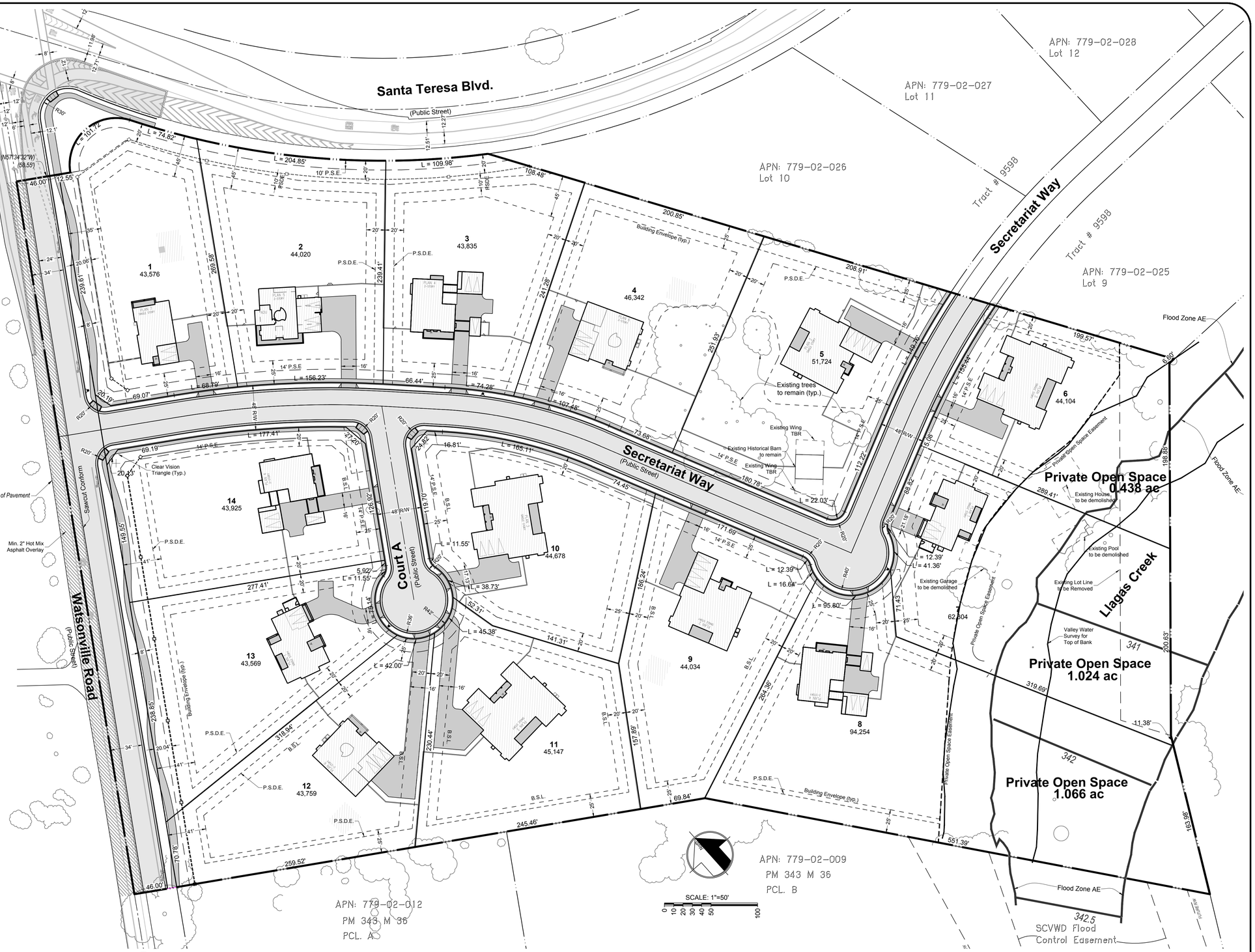
Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1 (RPD)
PROPOSED ZONING:	RE-1 (RPD)
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

	Building Coverage Calculations		
Lot #	Lot Area (SF)	Building Area (SF)	Building Coverage (%)
1	43,576	2035	4.67%
2	44,020	3247	7.38%
3	43,835	3822	8.72%
4	46,342	3664	7.91%
5	51,724	5093	9.85%
6	44,104	5647	12.80%
7	62,304	3412	5.48%
8	94,254	3822	4.06%
9	44,034	5093	11.57%
10	44,678	5647	12.64%
11	45,147	5647	12.51%
12	43,759	3847	8.79%
13	43,569	3412	7.83%
14	43,925	3822	8.70%

# of times the plan occurs	
Plan 1	2
Plan 2	2
Plan 3	3
Plan 4	3
Plan 5	1
Plan 6	2
Plan 7	1

Lot#	# of Stories	Plan#	Total Living SF	BD	BA
1	Single Story	7	2035	4	3
2	2-Story	5	4620	4	3.5
3	2-Story	4	4279	4	4
4	2-Story	6	5651	5	4.5
5	Single Story	2	3805	4	3.5
6	Single Story	3	4187	4	4
7	Single Story	1	2821	3	3.5
8	2-Story	4	4279	4	4
9	Single Story	2	3805	4	3.5
10	Single Story	3	4187	4	4
11	Single Story	3	4187	4	4
12	2-Story	6	5651	5	4.5
13	Single Story	1	2821	3	3.5
14	2-Story	4	4279	4	4



quail vineyards

site development plan

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA (408) 421-2695
SANTA BARBARA CA 93109
EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 05/21/2023 DRAWN:RS CHECKED: WJM

Sheet **2** of **6**
25268.2

Plotted By: Rebecca Schultz | Last Saved By: rebecca | Full Path: P:\25268.2 Quail Vineyards\Entitlements\Site Plan\25268.2 Site Development Plan.dwg | 5/21/2023 1:54:53 PM | Plotted: 5/21/2023 1:55:39 PM by Rebecca Schultz

Benchmark ID: BM 801
S.C.V.W.D.
Elevation: 339.70 (NAVD88)
Description: NGS Steel rod (aluminum box rim stamped "R1458 1990"); at the northeast corner of Watsonville Road and Sunnyside Avenue-Santa Teresa Boulevard; under center of PGE tower #11-75; 0.15 feet lower than rim. City of Morgan Hill.

Date of Ground Survey: 08-05-2008 and 10-15-2022
Date of Drone Survey: 03-15-2022

Tree Study

Tree Id #	Common Name	Species	D.B.H.	Height	Canopy	Condition
12993	Live oak	*Quercus virginiana*	21"	45'	35'	Good
12994	Live oak	*Quercus virginiana*	22"	45'	30'	Good
12995	Live oak	*Quercus virginiana*	16"	40'	25'	Fair
12996	Live oak	*Quercus virginiana*	28"	55'	45'	Good
12997	Live oak	*Quercus virginiana*	24"	60'	40'	Fair
12998	Live oak	*Quercus virginiana*	24"	45'	35'	Good
12999	Bottle tree	*Callistemon viminalis*	35"	55'	45'	Fair
13000	Coastal redwood	*Sequoia sempervirens*	54"	100'	40'	Fair
4121	Deodar cedar	*Cedrus deodara*	39"	60'	50'	Fair
4122	Live oak	*Quercus virginiana*	25"	50'	35'	Fair
4123	Live oak	*Quercus virginiana*	38"	55'	45'	Fair
4124	Modesto ash	*Fraxinus velutina*	28"	75'	50'	Fair
4125	Modesto ash	*Fraxinus velutina*	27"	65'	45'	Fair
4126	Incense cedar	*Calocedrus decurrens*	36"	80'	45'	Good
4127	Modesto ash	*Fraxinus velutina*	31"	56'	60'	Poor
4128	Live oak	*Quercus virginiana*	32"	50'	50'	Excellent
4129	Live oak	*Quercus virginiana*	27"	60'	50'	Fair
4130	Pecan	*Carya illinoinesis*	26"	60'	60'	Poor
4131	Live oak	*Quercus virginiana*	17"	20'	15'	Good
4132	Live oak	*Quercus virginiana*	31"	40'	50'	Excellent
4133	Live oak	*Quercus virginiana*	31"	30'	20'	Fair
4134	Fruitless mulberry	*Morus alba*	23"	25'	35'	Good
4135	English walnut	*Juglans regia*	42"	40'	30'	Poor
4136	Coastal live oak	*Quercus agrifolia*	27"	65'	40'	Fair

Legend

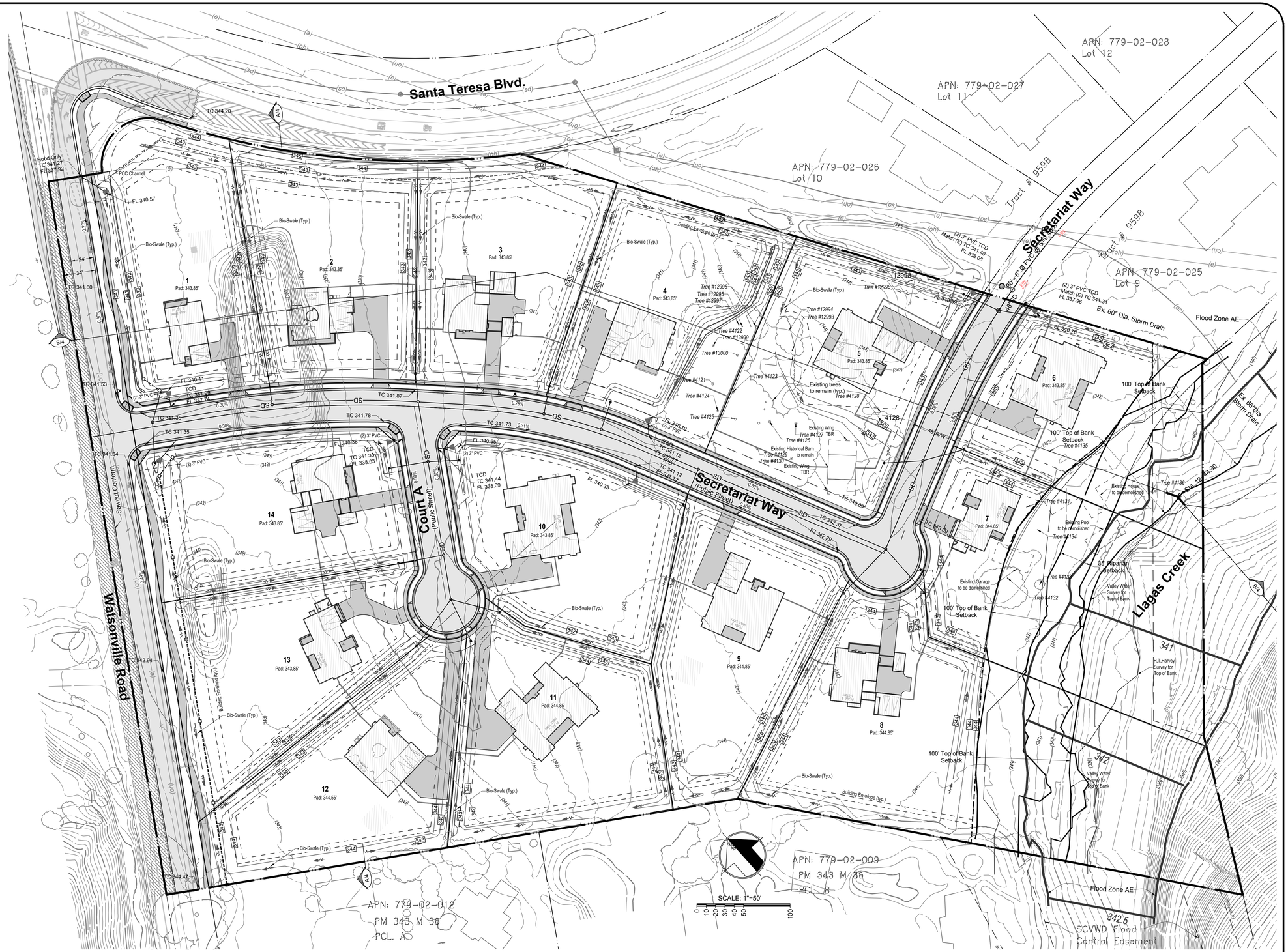
AC PAVEMENT

CONCRETE SIDEWALK/DRIVEWAY APRON

TCD.....Through Curb Drain per std detail S-10

Grading Quantities

Cut (C.Y.)	Fill (C.Y.)	Net (C.Y.)	Max. Cut	Max. Fill
4,241	42,974	38,733 (Import)	3.21'	5.25'



quail vineyards

preliminary grading plan

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BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
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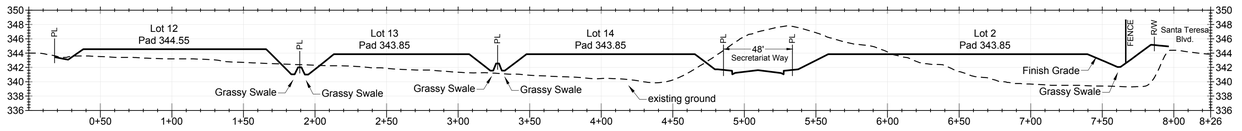
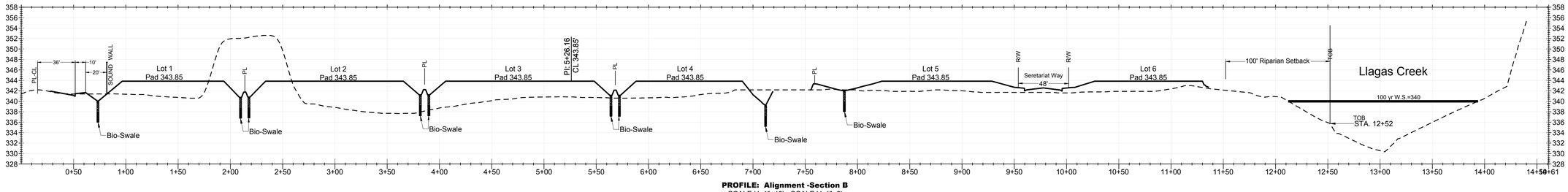
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 05/21/2023 DRAWN:RS CHECKED: WJM

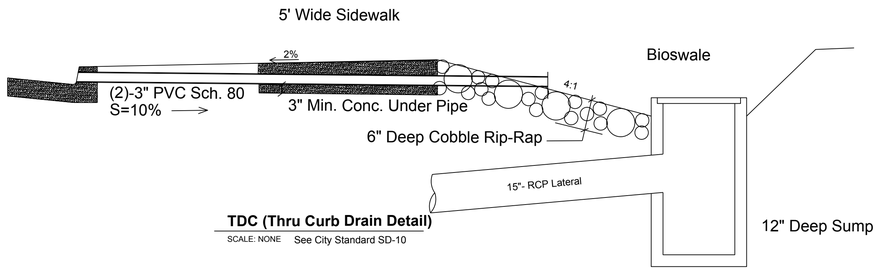
Sheet **3** of **6**
25268.2



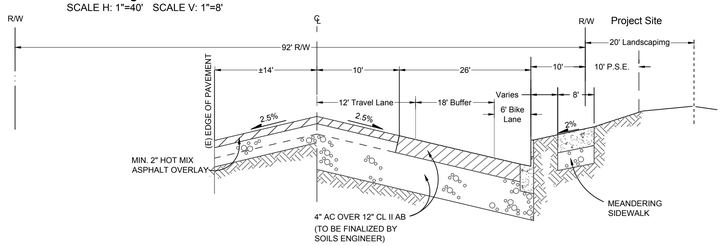
PROFILE: Section: A
SCALE H: 1"=40' SCALE V: 1"=8'



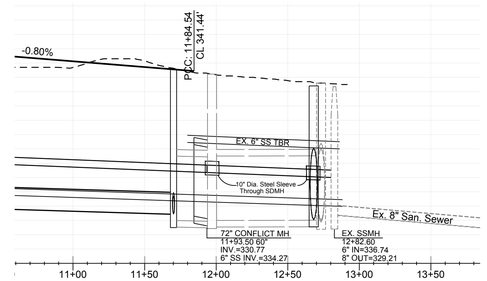
PROFILE: Alignment -Section B
SCALE H: 1"=40' SCALE V: 1"=8'



TDC (Thru Curb Drain Detail)
SCALE: NONE See City Standard SD-10



Typical Street Section
WATSONVILLE ROAD
SCALE: NONE T.I.=8



CONFLICT MANHOLE DETAIL and Justification

Two 72" dia. conflict manholes are beig proposed for sanitary sewer conflicts with existing large 60" dia. storm drains in existing Secratariat Drive. 10" dia. steel sleeves are proposed through the storm drain manhole to encase the new 6" dia. PVC sanitary sewer. The sleeve is above the spring line of the 60" storm pipe so the sleeve will not cause debris to plug the pipe. The manhole also provides more conveyance than the pipe so no hydraulic issues will be encountered. The only alternative to replacing the existing sewer with conflict manholes is to install a sanitary sewer pump station which is not the "green" solution.

Broadband Standards

CITY OF MORGAN HILL

For Broadband connectivity, a project is required to install conduits in all the public rights-of-way fronting the project site to accommodate multiple broadband providers. The following standards apply:

A. Design Plans

1. The project is required to submit design plans to include an engineering plan and profile of each street showing the location of existing underground utilities in the proposed path of the broadband conduit installation.
2. The design plans shall also include the approximate locations and dimensions for surface restoration.

B. Broadband Conduit

1. Provide a minimum of two (2) conduits each with at least two pull cables. At least one conduit shall remain empty and reserved for use by a potential future broadband service provider.
2. Each conduit shall be a 4" diameter PVC pipe, non-pressure type but has adequate stiffness for direct burial usage without encasement in concrete. The type of pipe shall be consistent with industry standards and be orange in color.
3. Broadband system designers shall field-verify the locations of existing utilities and surface features along and adjacent to the proposed conduit alignment.
4. The preferred horizontal conduit alignment is at centerline of sidewalk or as approved by the City Engineer.
   a. For conduits allowed in the street: Locate new conduit 3' from face of curb. Conduits shall be located parallel to the street centerline, where practicable, and shall not meander along the street. Street crossings shall be perpendicular to the street centerline.
5. Horizontal Clearance:
   a. Minimum 1' horizontal clearance from new conduit to other existing utilities, excluding water mains, gas lines, and electric lines.

   b. Minimum 3' horizontal clearance from new conduit to existing water main.
   c. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required horizontal separation requirements.
6. All conduits shall be installed underground using directional boring method or open trench.
   a. For Directional Bore Design
      i. Plans shall include a layout plan and profile sheets for directional bores. All existing utilities must be shown to scale on the plan and profile views.
      ii. Vertical Clearance: Provide 3' minimum vertical clearance from all utilities. This includes minor services, such as water services and sewer laterals. For deep crossings, provide a minimum of 5' clearance from utilities and structures. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required vertical separation requirements.
      iii. Boring and Receiving Pits: Show the length, width, depth, and location of the boring and receiving pits on the plans and profiles. The pits are to be located to minimize the construction impact to the adjacent properties and streets. Pits should not be in front of existing driveways, restaurants, bus stops, fire hydrants, and within street intersections.
      iv. Conflicts with Trees: If trees are in the way of the directional bore, the conduit shall be bored 8' to 12' underneath the tree roots rather than around the tree.
   b. For Trench Design
      i. For open-trench construction in the street: Conduit shall have a minimum cover of 36" above the top of the conduit and allow at least 6" between the top of the conduit and the bottom of the street structural pavement section.
      ii. For a trench outside the street section: Conduit shall have a minimum cover of 30".
      iii. Open trenches deeper than 60" must comply with Cal/OSHA standards, requiring protective systems, such as shoring.

      iv. Vertical Clearance: Provide 12" minimum vertical clearance from all other utility lines and services, including other telecommunication lines.
7. Tracer Wire: The conduits shall be installed with a tracer wire.
   a. Install tracer wire in the trench or bore with all underground conduits. Ensure the tracer wire provides end-to-end electrical continuity for electronically locating the underground conduit system.
   b. In a trenching operation, install the tracer wire no more than 3" above the conduit.
   c. In a boring operation, install the tracer wire in an encasement.
8. Identification Tape: A 6" wide, orange magnetically detectable identification tape shall be installed 12 inches above the entire length of the conduit route. The tape shall be continuously imprinted with "BROADBAND CONDUIT".

C. Pullboxes

1. Indicate locations of all pullboxes, other service boxes and manholes on the design plans.
2. Pullboxes shall be a No. 8 pullbox per City of Morgan Hill Standard E-6.
3. Pullboxes and splice boxes shall be located within the park strip/planter strip or at the back of sidewalk unless the City Engineer approves an alternative location.
4. The maximum distance between any two pull boxes shall not exceed 1,200 feet. Within the 1,200-feet distance, provide pullboxes at locations wherever the cumulative change of direction of the conduit exceeds 180 degrees.
5. The minimum bending radius for conduit shall be 3 feet.
6. Pullboxes shall be located a minimum of 12 inches from all structures.

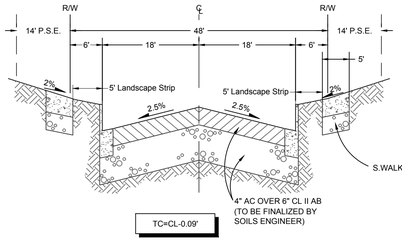
D. Manholes

1. A detail of the manhole must be shown on the plans.
2. Manholes for broadband conduit shall not be allowed in the street unless an exception is granted by the City Engineer.

3. Manholes allowed to be in the street must have cast iron frames and covers.
4. Manholes that are in sidewalks shall have a concrete polymer frame and cover that matches the color and texture of the sidewalk.
5. Manholes shall not be placed within a driveway approach or within the curb return at intersections.
6. All manholes must be rated for a minimum H-20 wheel load.
7. The name "BROADBAND" shall be permanently cast into or engraved on the manhole covers.

E. Related Work

Refer to the City's Design Standards and Standard Details for Construction for pavement materials, trench limits of restoration, backfill for boring, and backfill for trenching.



Typical 48' Street Section
SCALE: NONE T.I.=6 R-VALUE=37

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

quail vineyards

grading cross sections

Geotech Engineer: Earth Systems

Biologist H.T. Harvey and Ass.

Applicant: BLACKROCK LLC, 2730 LONE OAK CT., GILROY, CA 95020, (408) 892-8345

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Planner: DEVELOPMENT PROCESS CONSULTANTS, 2424 CALLE GALICIA, SANTA BARBARA, CA 93109, (408) 421-2695

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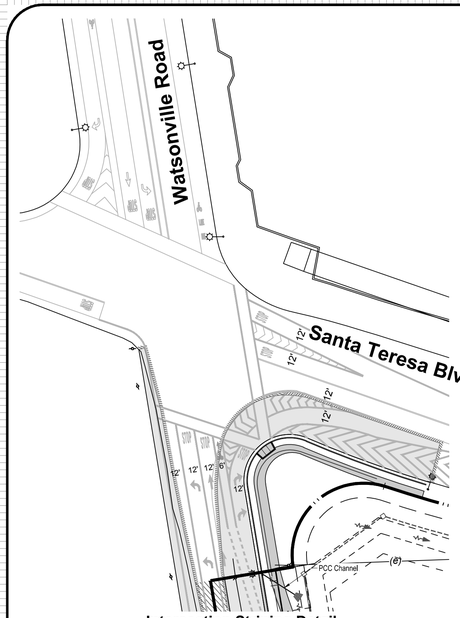
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 05/21/2023 DRAWN:RS CHECKED: WJM

Sheet **4** of **6**
25268.2

Unauthorized changes and uses may be subject to discipline and legal action. When using this set of plans, you agree to hold the Engineer harmless and indemnify him for all claims arising from your modifications. These plans are not to be used for any other purpose or on any other project without written authorization.

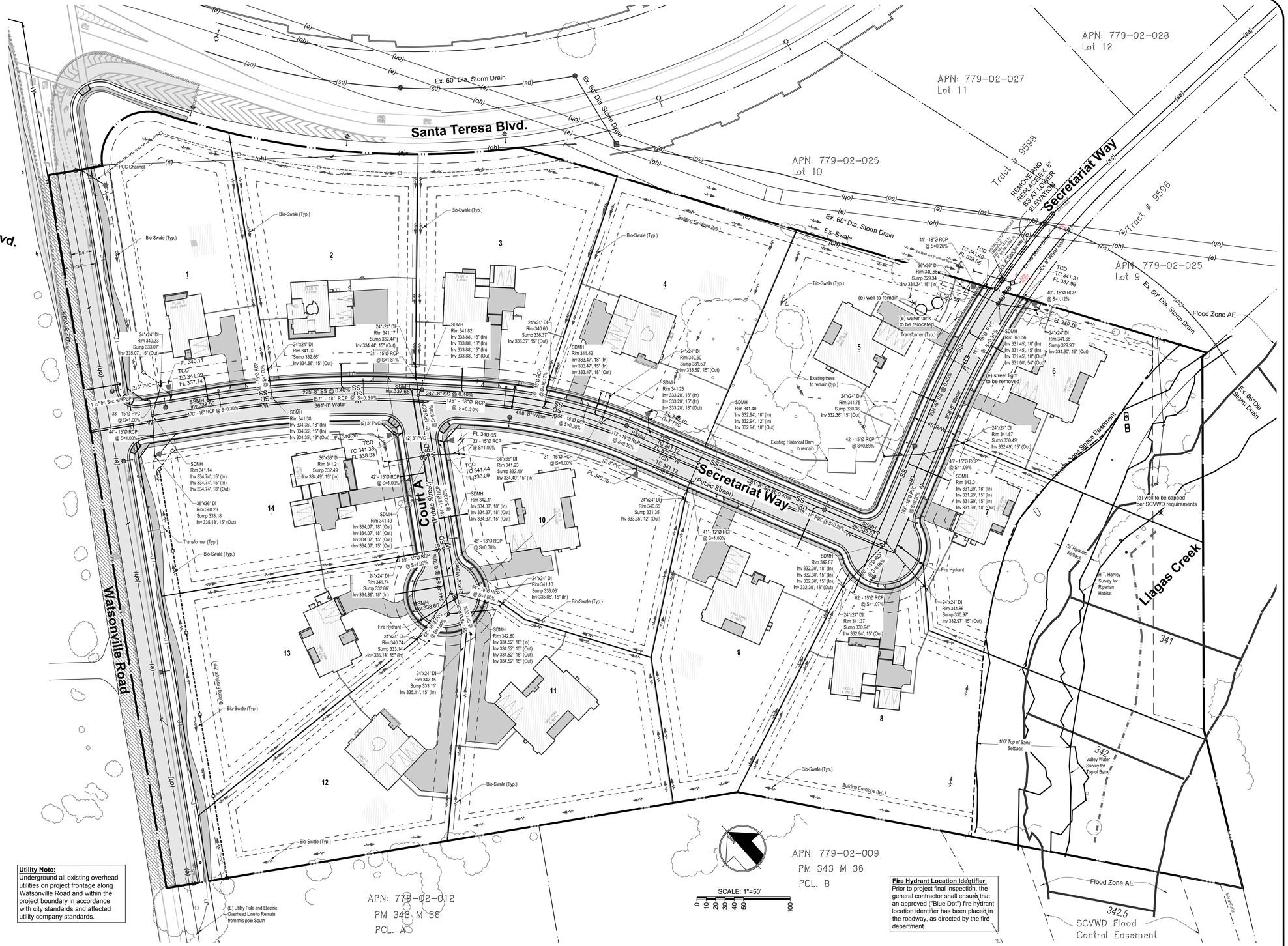


Intersection Striping Detail
Scale: 1"=50'

Legend

Proposed	Description	Existing
	Project Property Boundary	
	Property Line	
	Centerline	
	Easement, as noted	
	Curb and Gutter	
	Driveway Approach	
SD	Storm Drain	(sd)
SD	Perforated Storm Drain	(sd)
SS	Sanitary Sewer	(ss)
W	Water Main	(w)
IRR	Irrigation Line	(irr)
F	Fire Service	(f)
G	Gas Main	(g)
E	Underground Electric	(e)
E OH	Overhead Electric	(e) (oh)
T	Telephone	(t)
T OH	Overhead Telephone	(t) (oh)
JT	Joint Trench/ Broadband	(jt)
	Chainlink Fence	
	Wood Fence	
	Street Barricade	
100	Major Contour	(100)
99	Minor Contour	(99)
	Benchmark	
	Monument, Type as shown	
2	Revision	
A/A	Section	
	Swale	
2.2%	Slope	(2.1%)
SD	Storm Drain Manhole	(sd)
	Curb Inlet	
	Drop Inlet	
SS	Sanitary Sewer Manhole	(ss)
	Fire Hydrant	(fh)
CO	Cleanout	(co)
	Gate Valve	
	Transformer	
	Utility Pole	
	Electrolier	
S	Sewer Service	S
W	Water Service	W
	Transformer	
	AC Pavement	
	AB Areas	
	PCC walks/driveways	
	Structures	
	Bio-Retention Area	
	Decorative Pavers	

** existing features are labeled in italics and parenthesis, typical



Utility Note:
Underground all existing overhead utilities on project frontage along Watsonville Road and within the project boundary in accordance with city standards and affected utility company standards.

Fire Hydrant Location Identifier:
Prior to project final inspection, the general contractor shall ensure that an approved ("Blue Dot") fire hydrant location identifier has been placed in the roadway, as directed by the fire department

quail vineyards

site utility plan

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DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

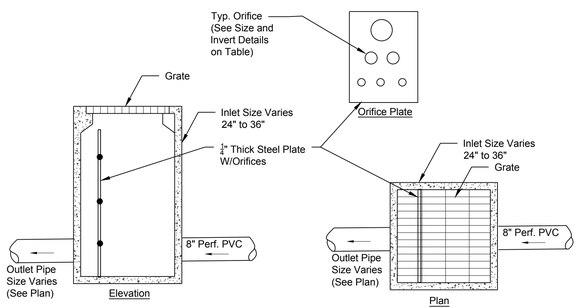
DATE: 05/21/2023 DRAWN:RS CHECKED: WJM

Bio-Swale Area table

DMA NO.	Required Bio-swale area (sf)	Provided Bio-swale area (sf)
1	2,242	2,385
2	643	680
3	711	720
4	586	600
5	681	780
6	576	640
7	631	640
8	2,065	2,210
9	1,147	1,190
10	892	1,020
11	973	1,050
12	666	750
13	298	360
14	371	460
15	741	800
16	598	680
17	475	600
18	929	1,000
19	2,184	2,250
20	789	875
21	840	850
22	732	750
23	964	1,000
24	524	560
25	526	580
26	711	640
27	636	560
28	2,809	2,850
29	681	700
30	847	950

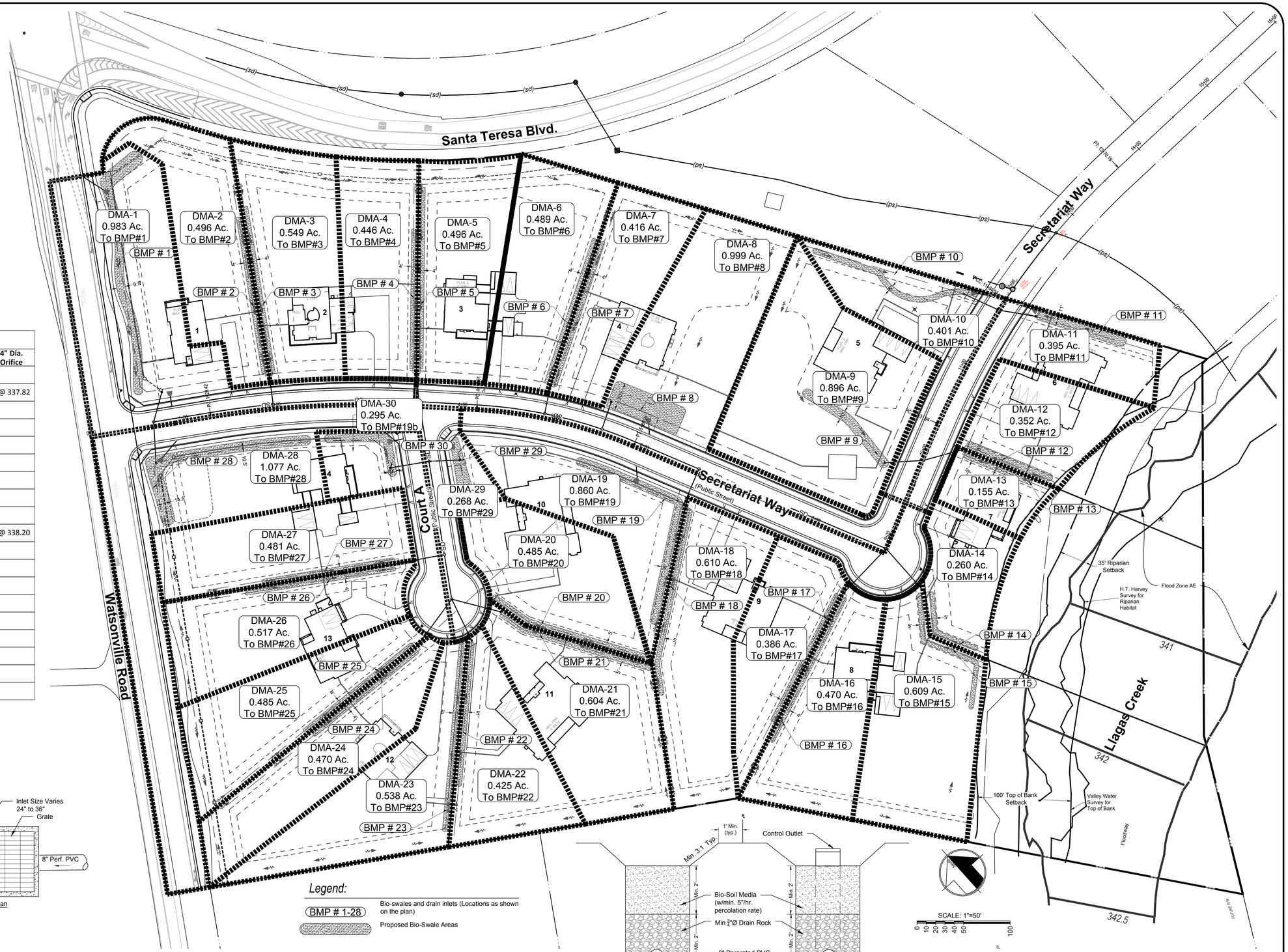
Plate Configuration inside Inlet

DMA No.	Grate	Top of Plate Elev.	1" Dia. Orifice	2" Dia. Orifice	3" Dia. Orifice	4" Dia. Orifice
1	2' by 2' @ 340.33	340.00	4 @335.83	1 @339.20	2 @ 339.80	
2 & 3	2' by 2' @ 341.02	340.00			2 @ 336.52	1 @ 337.82
4 & 5	2' by 2' @ 341.17	340.00		2 @ 336.67	1 @ 338.87	
6 & 7	2' by 2' @ 340.60	340.00			2 @ 336.10 1 @336.80	
8	2' by 2' @ 340.60	340.20		1 @ 336.10	1 @ 337.10	
9	2' by 2' @ 341.75	340.00	3 @ 336.36	1 @ 337.90		
10	2' by 2' @ 340.86	340.20	3 @ 336.36	1 @ 337.90		
11	2' by 2' @ 341.68	341.20		2 @ 340.00		
12 & 13	2' by 2' @ 341.87	340.00		1 @ 337.37	1 @338.20	
14 & 15	2' by 2' @ 341.87	340.00			2 @ 337.37	1 @ 338.20
16 & 17	2' by 2' @ 341.37	340.00		2 @ 336.87	1 @ 338.00	
18 & 19	2' by 2' @ 340.66	340.00		3 @ 336.16	1 @ 338.80	
20 & 21	2' by 2' @ 341.13	340.00		2 @ 338.13	2 @ 336.13	
22 & 23	2' by 2' @ 342.15	340.00		3 @ 337.65 1 @ 338.65		
24 & 25	2' by 2' @ 340.74	340.00		2 @ 336.24		
26 & 27	2' by 2' @341.74	340.00		2 @ 337.24	1 @ 339.24	
28	3' by 3' @340.23	340.00		1 @336.50 1 @335.73		
29	3' by 3' @341.23	340.00	2 @336.73 2 @337.50			
30	3' by 3' @341.21	340.00	3 @336.73 3 @337.50			



Typical Outlet Control Structure Detail

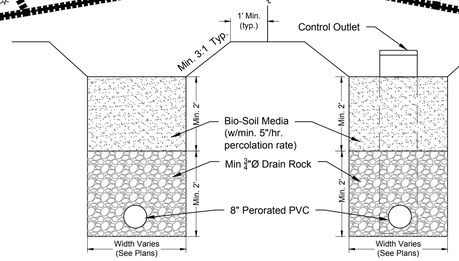
N.T.S.



Legend:

BMP # 1-28 — Bio-swales and drain inlets (Locations as shown on the plan)

Proposed Bio-Swale Areas



Typical Bio-Swale Detail Along Property Line

N.T.S.

quail vineyards

Stormwater Control Plan

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 05/21/2023 DRAWN:RS CHECKED: WJM

Sheet **6** of **6**

25268.2

MH engineering Co.
16075 Vineyard Blvd. Morgan Hill, CA 95037 - (408) 779-7381

Attachment H:
BMP Operations and Maintenance Agreement

RECORDING REQUESTED BY:

CITY OF MORGAN HILL

WHEN RECORDED MAIL DOCUMENT TO:

CITY CLERK
CITY OF MORGAN HILL
17575 PEAK AVENUE
MORGAN HILL, CA 95037

RECORD AT NO FEE PER GOVERNMENT CODE SECTIONS 6103 & 27383

(ENTER APN OR LEAVE BLANK) SPACE ABOVE THIS LINE FOR RECORDER'S USE

STORMWATER BEST MANAGEMENT PRACTICES, OPERATION, AND MAINTENANCE AGREEMENT

THIS STORMWATER BEST MANAGEMENT PRACTICES OPERATION, AND MAINTENANCE AGREEMENT ("AGREEMENT") is made and entered into this _____ day of _____, **2022**, by **BLACKROCk LLC**, (hereinafter referred to as "COVENANTOR") and the City of Morgan Hill ("CITY"). CITY and COVENANTOR may be referred to individually as a "Party" or collectively as the "Parties" throughout this AGREEMENT.

RECITALS:

This AGREEMENT is made and entered into with reference to the following facts:

A. CITY is authorized and required to regulate and control the disposition of storm and surface waters as set forth in CITY's National Pollutant Discharge Elimination System permit.

B. COVENANTOR is the owner of a certain tract or parcel of land more particularly described in Exhibit "A" attached hereto and incorporated herein by this reference (the "PROPERTY").

C. COVENANTOR desires to construct certain improvements of the kind or nature described in Morgan Hill Municipal Code Chapter 18.71 (the "ORDINANCE") on the PROPERTY that may alter existing stormwater conditions on both the PROPERTY and adjacent lands.

D. To minimize adverse impacts due to these anticipated changes in existing storm and surface water flow conditions, COVENANTOR is required by CITY to implement Best Management Practices ("BMPs") and to build and maintain, at COVENANTOR's expense, stormwater management facilities ("FACILITIES"), more particularly described and shown in the **Stormwater Control Plan** prepared by **MH engineering Co.** and dated **5/17/2022**, which plans and any amendments thereto, are on file with CITY's Public Works Department, and are hereby incorporated by this reference.

E. CITY has reviewed and approved the Stormwater Runoff Management Plan (the "PLAN") subject to the execution of this AGREEMENT.

NOW, THEREFORE, in consideration of the benefit received and to be received by COVENANTOR, its successors, and assigns, as a result of CITY's approval of the Stormwater Runoff Management Plan, COVENANTOR, hereby covenants and agrees with CITY as follows:

1. Covenants Running With the Land; Property Subject to Agreement: All of the real property described in Exhibit "A" shall be subject to this AGREEMENT. It is intended and determined that the provisions of this AGREEMENT shall run with the land and shall be binding on all parties having or acquiring any right, title, or interest in the real PROPERTY or any portion thereof and shall be for the benefit of each owner of any of said parcels or any portion of said PROPERTY and shall inure to the benefit of and be binding upon each successor in interest of the owners thereof. Each and all of the limitations, easements, obligations, covenants, conditions, and restrictions contained herein shall be deemed to be, and shall be construed as, equitable servitudes, enforceable by any of the owners of any of the PROPERTY subject to this AGREEMENT against any other owner, tenant or occupant of the said PROPERTY, or any portion thereof.

2. Responsibility for Installation, Operation, and Maintenance: At its sole expense, COVENANTOR, its successors, and assigns, shall construct, operate, and perpetually maintain the FACILITIES in strict accordance with the PLAN and any amendments thereto that have been approved by CITY or required by the ORDINANCE.

3. Facility Modifications: At its sole expense, COVENANTOR, its successors, and assigns, shall make such changes or modifications to the FACILITIES as may be determined as reasonably necessary by CITY to ensure that the FACILITIES are properly maintained and continue to operate as originally designed and approved. COVENATOR agrees that it shall not modify the BMPs and shall not allow BMP maintenance activities to alter the designed function of the FACILITIES from its original design unless approved by CITY prior to the commencement of the proposed modification or maintenance activity.

4. Facility Inspections by CITY: At reasonable times and in a reasonable manner as provided in the ORDINANCE, CITY, its agents, employees, and contractors shall have the right of ingress and egress to the FACILITIES and the right to inspect the FACILITIES in order to ensure that the FACILITIES are being properly maintained, are continuing to perform in an adequate manner, and are in compliance with the ORDINANCE, the PLAN and any amendments thereto approved by CITY.

5. Failure to Perform Required Facility Repairs or Modifications: Should either COVENANTOR or its successors and assigns fail to implement the BMPs, maintain the facilities, or correct any defects in the FACILITIES in accordance with the approved design standards and/or the PLAN, and in accordance with the law and applicable regulations of the ORDINANCE, after thirty (30) days from the date of the written notice from CITY, CITY shall have the right to enter the PROPERTY to perform remedial work, for which CITY will collect reimbursement for such work from COVENANTOR. Additionally, conditions from failure to implement the BMPs or to maintain or correct the FACILITIES shall be deemed a nuisance subject to abatement of such conditions as provided in Chapter 1.18 of the Morgan Hill Municipal Code. In addition, CITY may pursue other such remedies as provided by law, including, but not limited to, such civil and criminal remedies set forth in the ORDINANCE.

6. Indemnity: COVENANTOR, its successors, and assigns, shall defend, indemnify, and hold CITY harmless of and from any and all claims, liabilities, actions, causes of action, and damages for personal injury and property damage, including, without limitation, reasonable attorneys' fees, arbitration fees, or costs and court costs, arising out of or related to COVENANTOR's, its successors', and/or assigns' construction, operation, or maintenance of the FACILITIES except claims, liabilities, actions, causes of action, and damages that arise out of CITY's sole negligence or willful misconduct or the sole negligence or willful misconduct of any of CITY'S employees, agents, representatives, contractors, vendors, or consultants.

7. Obligations and Responsibilities of COVENANTOR: Initially, COVENANTOR is solely responsible for the performance of the obligations required hereunder and, to the extent permitted under applicable law, the payment of any and all fees, fines, and penalties associated with such performance or failure to perform under this AGREEMENT. Notwithstanding any provisions of this AGREEMENT to the contrary, upon the recordation of a deed or other instrument of sale, transfer or other conveyance of fee simple title to the PROPERTY or any portion thereof (a "Transfer") to a third party (the "Transferee"), COVENANTOR shall be released of all of its obligations and responsibilities under this AGREEMENT accruing after the date of such Transfer to the extent such obligations and responsibilities are applicable to that portion of the PROPERTY included in such Transfer, but such release shall be expressly conditioned upon the Transferee assuming such obligations and responsibilities by recorded written agreement for the benefit of CITY. Such written agreement may be included in the Transfer deed or instrument, provided that the Transferee joins in the execution of such deed or instrument. A certified copy of such deed, instrument, or agreement shall be provided to CITY. The provisions of the preceding three sentences shall be applicable to the original COVENANTOR and any successor Transferee who has assumed the obligations and responsibilities of COVENANTOR under this AGREEMENT as provided above.

8. Property Transfer: Nothing herein shall be construed to prohibit a transfer by COVENANTOR to subsequent owners and assigns.

9. Attorneys' Fees: In the event that any Party institutes legal action or arbitration against the other to interpret or enforce this AGREEMENT, or to obtain damages for any alleged breach hereof, the prevailing party in such action or arbitration shall be entitled to reasonable attorneys' or arbitrators' fees in addition to all other recoverable costs, expenses, and damages.

10. Further Documents: The Parties covenant and agree that they shall execute such further documents and instructions as shall be necessary to fully effectuate the terms and provisions of this AGREEMENT.

11. Entire Agreement: This AGREEMENT constitutes the entire agreement of the Parties with respect to the subject matter contained herein and supersedes all prior agreements, whether written or oral. There are no representations, agreements, arrangements, or undertakings, oral or written, that are not fully expressed herein.

12. Severability: In the event any part or provision of this AGREEMENT shall be determined to be invalid or unenforceable under the laws of the State of California, the remaining portions of this AGREEMENT that can be separated from the invalid, unenforceable provisions shall, nevertheless, continue in full force and effect.

13. No Waiver: The waiver of any covenant contained herein shall not be deemed to be a continuing waiver of the same or any other covenant contained herein.

14. Amendment: This AGREEMENT may be amended in whole or in part only by mutual written agreement. Any such amendment shall be recorded in Santa Clara County, California. In the event any conflict arises between the provisions of any such amendment and any of the provisions of any earlier document or documents, the most recently duly executed and recorded amendment shall be controlling.

15. In the event that CITY shall determine, at its sole discretion, at any future time, that the FACILITIES are no longer required, then at the written request of COVENANTOR, its successors, and/or assigns, CITY shall execute a release of this AGREEMENT which COVENANTOR, it successors, and/or assigns, shall record in the Recorder's Office, at its expense.

Executed the day and year first above written.

COVENANTOR:

By: _____

Name: **Mitchell L. Lorenz**

Title: **Director of Construction - Retail**

CITY OF MORGAN HILL:

By: _____

Name: **STEVE RYMER**

Title: **CITY MANAGER, CITY OF MORGAN HILL**

APPROVED AS TO FORM:

By: _____

Name: **DONALD A. LARKIN**

Title: **CITY ATTORNEY, CITY OF MORGAN HILL**

EXHIBIT “A”

Legal Description

Exhibit A-2

Contract with RCE to perform annual certification

MH engineering Co.

Contract/ Proposal for Professional Services

Date: _____ **Job #** 25268.2

This agreement is entered into by and between MH engineering Co. and

Client:

Project: **Blackrock Development**

Scope of Work: Post construction storm water BMP inspections and annual certification.
Inspection/Certification requirements: as outlined in the City approved storm water runoff management plan

Deliverables:

a.) **Storm water treatment control (BMP) inspection: Pre-Rainy season before Sept. 15th and Post-Rainy season before May 1st every year.**
b.) **Storm water treatment control (BMP) Annual Inspection Certification before Sept. 30th each year.**

NOTE: *1) It shall be the responsibility of Client to contact MH Engineering and request these inspections in writing prior to above bi-annual deadlines indicated in a) and b) above. 2) Client shall furnish labor to inspect BMPs if needed and facilitate access to accomplish a) and b) above*

Fee for services: The fee for the proposed professional services shall be on a T&M basis @ $170/hour. Inspection and reporting to the City is estimated to take approximately 8 hours each occurrence. Client to be billed as the work accrues on a monthly basis with any remainder due upon issuance of deliverables. Payment is overdue after 30 days. Accounts past due will are subject to a 1-1/2% per month finance charge. All change orders shall be presented to the Client for review and authorization prior to any work being performed. Fees for all change orders shall be agreed in advance of work. Time and Material change orders shall be billed at the hourly rates shown on the attached MH Billing Rate Sheet Exhibit "B". This proposal is subject to change if not accepted within 60 days of the date above.

Hourly Fee Schedule: See attached Exhibit B.

Reimbursable Expenses: The above fee does not include reproduced plots and prints. Blueprinting, copies, and other reproducible expenses shall be invoiced at their actual cost and shall be included in the final invoice.

Termination: Termination of this contract may be invoked by either party and must be in written form. Payment for services completed through the termination date will be due and payable at that time. Payment for contracts that are not time and materials, i.e. fixed fee, will be charged at the actual time spent times the hourly rate, not to exceed the fixed fee price.

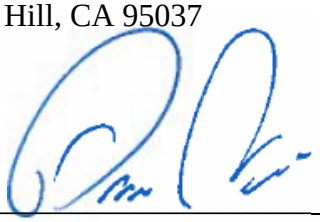
MH engineering Co.

Schedule: MH engineering Co. will diligently proceed to complete the professional services as described in this agreement in a timely manner. However it is expressly agreed that MH engineering Co. shall not be held responsible for delays in performance occasioned by factors beyond MH engineering Co's control.

Limits of Liability: Client agrees to limit the liability of MH engineering Co, it's principals, agents, employees, officers, directors, shareholders, and consultants, to client and to all contractors and subcontractors on the project, for any claim or action arising in any action at law whether in tort or contract and damages therefrom, or any suit in equity or other proceedings, and from any claimed error, omission or other professional negligence in regard to this project to the sum of five thousand dollars ($5,000) or the fee to be paid by the client, whichever is greater.

I have read and understand the above contract including the limitation of liability provision and acknowledge this act by signing below:

MH engineering Co.
16075 Vineyard Blvd.
Morgan Hill, CA 95037



_____
By: Arman Nazemi, PE 55927

_____
Date:

_____
Client:

_____

Attachment J:
Storm Water Treatment Control
Operation & Maintenance Plans

I. BMP-1: Site Housekeeping 2
II. BMP-2: Bio-Retention /Storm drain inlets Maintenance 4

I. BMP-1: Site Housekeeping

1 Objective:

1.1 to reduce impacts from storm water runoff by developing and implementing good housekeeping practices.

2 General Housekeeping

2.1 Keep parking areas, material storage and staging areas clean and orderly.

2.2 Establish a daily checklist to confirm cleanliness and adherence to proper storage and security. Where feasible, individual employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.

2.3 Provide an adequate number of trash and recycling receptacles.

2.4 Post "No Littering" signs and enforce anti-littering laws.

2.5 Dispose of wash water properly. Wash water shall not be allowed to flow to the storm drain system.

2.6 Sediment and sweeping debris shall be properly disposed.

3 Mechanical Sweeping

3.1 Mechanical sweeping shall be performed on a scheduled basis. The frequency of mechanical sweeping shall be based on visual observation of waste accumulation.

3.2 Mechanical sweeping equipment shall only be used by personnel trained in using mechanical sweeping equipment.

3.3 Mechanical sweeping of all outside equipment staging areas, materials storage areas and parking areas will be performed at least once prior to the onset of the wet season (September 15).

3.4 Mechanical sweeping will be coordinated with maintenance activities on other storm water treatment measures located on the site (i.e. stormceptors, CDS units, drain inlet filters).

3.5 Dispose of debris properly.

4 Manual Sweeping

4.1 Manual sweeping will be used in areas where mechanical sweeping cannot be effectively implemented.

4.2 Manual sweeping will be coordinated with maintenance activities on other storm water treatment measures located on the site.

4.3 Dispose of debris properly.

5 Surface Cleaning

5.1 Surface cleaning shall be used in areas where heavy oil deposits are encountered.

5.2 Dry cleaning methods (e.g. application of absorbent followed by sweeping and vacuuming) shall be employed first to prevent the discharge of pollutants to the storm drain system.

5.3 If wet cleaning is required to effectively remove pollutants, all wash water shall be collected and disposed to landscape or the sanitary sewer, as appropriate. If discharge to the sanitary sewer is necessary, prior approval from City of Morgan Hill is required.

5.4 Dispose of debris properly.

6 Vector Control

6.1 Ensure that there are no areas of standing water on site. Areas of standing water shall be drained or cleared as soon as they are located,

6.2 Vector Control District: The Santa Clara County Vector Control District (SCCVCD) will be contacted as needed for assistance should any mosquito issues arise. Mosquito larvicides should be applied only when absolutely necessary as indicated by the SCCVCD, and then only be a licensed professional or contractor. The contact information for SCCVCD follows:

Santa Clara County Vector Control District
1580 Berger Dr.
San Jose, Ca 95112
Phone: (408) 918-4770

7 Pesticide Reduction Plan and Measures

7.1 Objectives: to reduce or eliminate the use of chemicals necessary to prevent pests of the landscape and to reduce the potential for pesticides to runoff the landscape.

7.2 Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.

7.3 Use geotextiles and apply 2-4 inches of mulch to exposed soils to prevent weed growth.

7.4 Replace problem plants with locally adapted, pest resistant plants. Do not plant invasive species.

7.5 Prune plants properly and at the appropriate time of year.

7.6 Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable.

7.7 Provide adequate irrigation for landscape plants. Do not over water.

7.8 Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.

7.9 If chemical controls are necessary, use least-toxic pesticide first. Avoid the use of broad-spectrum pesticides.

7.10 Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.

7.11 Only licensed, trained pesticide applicators shall apply pesticides.

7.12 Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.

7.13 Unwanted/unused pesticides shall be disposed as hazardous waste.

7.14 Correspondence: Correspondence regarding operations, inspections and maintenance of the storm water treatment measures shall be provided to the City of Morgan Hill, Public Works, Engineering as required and according to the schedule outlined in this SWRMP.

NOTE: Best Management Practices delineated in this Operations & Maintenance Agreement are minimum requirements. More stringent requirements may apply to specific projects as environmental mitigation measures under the California Environmental Quality Act, and/or as conditions of approval for a development project (such as a map, a planned district, a zoning administrator permit, a conditional use permit, or other permit or project approval by the City).

II. BMP-2: Bio-Retention /Storm drain inlets Maintenance

1. Objectives:

1.1. Site runoffs from roof and pavement area are to be captured into the bio-swale for quality treatment via soil media. The bio-swale will remove the sediments and break down the pollutant before entering the underground structure for infiltration or draining into public storm drain system. The Bioswale, will catch heavy sediments, trash, and other debris before it is treated and relief to the ground or public drain system. Therefore, most maintenance efforts should be directed at the pre- treatment structures to ensure they are functioning properly.

2. Monitoring Bio-swale

2.1. Typically, bio-swale must be monitored to regularly for standing water and erosion. The monitoring requires visual inspection and testing for the percolation rate on annual basis. In case the percolation rate depreciate replacement of the soil media will be necessary.

3. Monitoring Inlets:

The inlets in the bio-swale are acting as an over flow protection measures. It is crucial to check the condition of the inlet on regular basis. The inlets grates, sump area are the most susceptible area of structure that will cause system to fail when they are not maintained properly due to accumulation of trash and sediments.

4. Maintenance Intervals

4.1. Maintenance Schedules for the bio-swale must be on regular basis. A standard maintenance schedule may include quarterly inspections through the first year of use, with yearly inspections thereafter. Flushing should be performed if sediment should reach a pre-determined depth or volume of the storage capacity which reduces performance of the system to unacceptable levels.

Attachment K:

Storm Water Treatment Control

Operation & Inspection Logs, Forms & Checklists

Annual Stormwater BMP Inspection & Maintenance Log 2
Storm Water BMP Annual Inspection Certification 4
BMP- Inspection and Maintenance Checklist for Bio-retention: 7

MH engineering Co.
16075 Vineyard Blvd. Morgan Hill, CA 95037 - (408) 779-7381

Annual Stormwater BMP Inspection & Maintenance Log

Facility Name _____

Location: _____

Begin Date: _____ End Date: _____

Date	BMP#	BMP Description	Inspected By	Cause for inspection	Exceptions noted	Comments and Actions Taken

Instructions: Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the City, and start a new log at that time.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.

MH engineering Co.
16075 Vineyard Blvd. Morgan Hill, CA 95037 - (408) 779-7381

Storm Water BMP Annual Inspection Certification

This form is to be completed and submitted annually by ***September 30*** to the City of Morgan Hill Public Works Director.

Project Information

Project Name _____

Property Address: _____

Owner/Developer _____

APN # : _____ Date of Inspection: _____

BMP Description and Number: (identify all that apply)

☐ Bioretention Areas	☐ Detention Basin	☐ Vegetated (Bio) Swale
☐ Atlantis Raintank	☐ Filtration Basin	☐ Riparian Buffer
☐ Permeable pavement	☐ Proprietary Devices	☐ Rooftop Runoff/Harvesting
☐ Sand Filter	☐ Stormwater Wetlands	☐ Pump System
☐ Underground Storage/Detention	☐ Other (Describe):	

General Information for all BMPs:

Yes	No	N/A	
☐	☐	☐	Has sediment accumulated in the inlet, outlet or forebay?
☐	☐	☐	Are there signs of erosion or any denuded areas?
☐	☐	☐	Is there trash or debris that needs to be removed? (esp. at outlet structures)
☐	☐	☐	Are algae, aquatic weeds or invasive plants (particularly cattails) present?
☐	☐	☐	Is there evidence of cracks, separation or alignment problems with pipes?
☐	☐	☐	Are rip-rap dissipater pads damaged, clogged with vegetation or insufficient?
☐	☐	☐	For dry detention ponds, is there basin holding water longer than 5 days after a storm event?
☐	☐	☐	Is there evidence of muskrat activity?
☐	☐	☐	Are vegetated slopes steeper than 3:1?

			Is there evidence of depressions in the soil surface over and around any pipes?
			Are records of operation and maintenance available for inspections performed quarterly (include copy)
			Other problems not listed above (describe below)

Describe all problems in detail (use additional sheets if necessary):

Describe corrective actions needed (use additional sheets if necessary):

BMP Condition *(check one):*

☐ **FAILED INSPECTION**

Has MAJOR deficiencies and must be repaired in order to function properly and operate as designed. A final inspection and certification must be performed and submitted after repair.

☐ **CONDITIONAL APPROVAL**

Has MINOR deficiencies but repair is needed in order to ensure system does not fail. Final Certification can be issued with contingent upon corrective measures being addressed.

☐ **FINAL CERTIFICATION**

BMP has no deficiencies and a Final Certification will be issued.

Owner/ Representative Certification:

I have read and understand the findings of this inspection. I understand that I am responsible for correcting all deficiencies identified in this report by ***October 30th*** of this year.

Owner Signature: _____ Date: _____

Owner of Record: _____ Telephone: _____

Address: _____ Fax: Email: _____

Inspector´s Certification

As a duly registered Professional in the State of California, I hereby certify that the Stormwater BMP(s) described in this report were inspected under my responsible charge, and this report accurately identifies any deficiencies in the structure and function of the BMP(s).

Inspector Signature: _____ Date: _____

Inspector Name: _____ Telephone: _____

Company: _____ Fax: _____

Address: _____ Email: _____

_____ Credentials: _____

_____

Completed BMP Maintenance & Inspection Certification? Yes____ No___ Certification #:

BMP- Inspection and Maintenance Checklist for Bio-retention:

Property Address: _____

Property Owner: _____

Inspector(s): _____

Type of Inspection: ☐ Pre-Rainy Season ☐ Post-Rainy Season ☐ Monthly ☐ Annual

(September 15) *(May 1st)*

Treatment Measure No.:_____ Date of Inspection: _____

Check if the inlet and outlet are free of debris and obstruction, if so the area where poor drainage occurs may need new soil media.
Check if there is no standing water or poor vegetation within the swale.
Check for any erosion.
Check the inspection hand-hole for any debris or sediment within the chambers designated sumps. If so the sumps must be flushed clean.
Check for the drainage structure integrity.
Check for infiltration functioning as designed.

Attachment L

BMP Ram Protocols

Bioswale

BMP RAM v4.0 Field Observation Datasheet					
BMP ID					
Observation Date					
Observer Name					
Vegetation Cover					
	Vegetation Type				
	Wetland / Riparian Species	Tree Species	Grass Species	No Vegetation (Bare Soil)	Total = 100%
% cover					

Permeability		
Location	Time (minutes & seconds)	Remaining water height (inches)
First Third - Frequent		
First Third – Occasional		
Middle Third – Frequent		
Middle Third – Occasional		
Last Third – Frequent		
Last Third - Occasional		

Conveyance				
Location (Inlet/ Outlet)	Trash Capture Device (Y/N)	Functioning as intended?	If **NOT** functioning as intended, indicate type of action required	
			Requires debris removal?	Possible advanced maintenance?
		(Y/N)	(Y/N)	(Y/N)

Notes:

Drop Inlet

BMP RAM v4.0 Field Observation Datasheet			
Observation Date			
Observer Name			
Conveyance			
BMP ID TCD (Y/N)	Functioning as intended?	If **NOT** functioning as intended, indicate type of action required	
		Requires debris removal?	Possible advanced maintenance?
	(Y/N)	(Y/N)	(Y/N)

Notes:

Infiltration Feature

BMP RAM v4.0 Field Observation Datasheet					
BMP ID					
Observation Date					
Observer Name					
Vegetation Cover					
	Vegetation Type				
	Wetland / Riparian Species	Tree Species	Grass Species	No Vegetation (Bare Soil)	Total = 100%
% cover					

Permeability		
Location	Time (minutes & seconds)	Remaining water height (inches)
First Third - Frequent		
First Third – Occasional		
Middle Third – Frequent		
Middle Third – Occasional		
Last Third – Frequent		
Last Third - Occasional		

Conveyance				
Location (Inlet/ Outlet)	Trash Capture Device (Y/N)	Functioning as intended?	If **NOT** functioning as intended, indicate type of action required	
			Requires debris removal?	Possible advanced maintenance?
		(Y/N)	(Y/N)	(Y/N)

Notes:

City of Morgan Hill Post Construction Storm Water Pollution Prevention

City Municipal Code - Chapter 18.71

Chapter 18.71 POST CONSTRUCTION STORMWATER POLLUTION PREVENTION

Sections:

18.71.010 Purpose and intent.

18.71.020 Definitions.

18.71.030 Applicability: Permanent storm water pollution prevention measures required.

18.71.110 Design standards and selection of best management practices.

18.71.120 Stormwater runoff management plan required.

18.71.130 Stormwater runoff management plan contents.

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18.71.290 Acts potentially resulting in a violation of the Federal Clean Water Act and/or California Porter-Cologne Act.

18.71.300 Fees set by resolution.

18.71.010 Purpose and intent.

The purpose of this chapter is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds in compliance with applicable provisions of the Federal Clean Water Act and any National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permits issued to the City of Morgan Hill, through the following objectives:

A. Minimize increases in stormwater runoff from any development in order to reduce flooding, siltation and streambank erosion and maintain the integrity of stream channels;

B. increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality

C. Minimize the total annual volume of surface water runoff which flows from any specific site during and following development to not exceed the pre-development hydrologic regime to the maximum extent practicable.

D. Reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, through stormwater management controls and to ensure that these management controls are properly maintained and pose no threat to public safety.

The above objectives shall be met through adoption and implementation of best management practices (BMPs) in design, construction and maintenance. These BMPs shall be incorporated into permanent site design features, which shall remain functioning throughout the life of the development.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.020 Definitions.

The terms used in this chapter shall have the following meanings:

A. "One hundred thousand square foot commercial development" means any commercial development that creates at least one hundred thousand square feet of impermeable surface, including parking areas.

B. "Automotive repair shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

C. "Authorized enforcement officer" means the City of Morgan Hill Chief Engineer and those individuals designated by the chief engineer to enforce the provisions of this chapter, including the code enforcement officer(s) of the City of Morgan Hill's community development department.

D. "Best management practices" or "BMP" means activities, practices, and procedures as specified in Section 18.71.110 to prevent or reduce the discharge of pollutants directly or indirectly to the municipal storm drain system and waters of the United States. Best management practices (BMPs) include but are not limited to: treatment facilities and methods to remove pollutants from storm water; operating and maintenance procedures; facility management practices to control runoff, spillage or leaks of non-storm water, waste disposal, and drainage from materials storage; erosion and sediment control practices; and the prohibition of specific activities, practices, and procedures and such other provisions as the city determines appropriate for the control of pollutants.

E. "Clean Water Act" means the federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

F. "Commercial development" means any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

G. "Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and improvements related to land subdivision; any activity that moves soils or substantially alters the pre-existing vegetated or man-made cover of any land. This includes, but is not limited to, grading, digging, cutting, scraping, stockpiling or excavating of soil, placement of fill materials, paving, pavement removal, exterior construction, substantial removal of vegetation where soils are disturbed including but not limited to removal by clearing or grubbing, or any activity which bares soil or rock or involves streambed alterations or the diversion or piping of any watercourse. Development does not include routine maintenance to maintain original line and grade, hydraulic capacity, or the original

purpose of the facility, nor does it include emergency construction activities (i.e., land disturbances) required to protect public health and safety.

H. "Authorized enforcement officer" means the chief engineer and his or her designee, including authorized enforcement officer.

I. "Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater.

J. "Impervious surface" means a surface composed of any material that significantly impedes or prevents the natural infiltration of water into soil. Impervious surfaces include, but are not limited to, rooftops, buildings, streets and roads, and any concrete or asphalt surface.

K. "Industrial General Permit" means a NPDES permit issued by the state water resources control board for the discharge of storm water associated with industrial activity.

L. "National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permits" means general, group, and individual storm water discharge permits which regulate facilities defined in federal NPDES regulations pursuant to the Clean Water Act. The California Regional Water Quality Control Board, Central Coast Region (hereinafter, Regional Board) and the State Water Resources Control Board have adopted general storm water discharge permits, including but not limited to the general construction activity and general industrial activity permits.

M. "Operation and maintenance agreement" means a written agreement entered into pursuant to Section 18.71.160, providing for the long-term operation and maintenance of stormwater management facilities and practices on a site or with respect to a land development project, which when properly recorded in the deed records constitutes a restriction on the title to a site or other land involved in a land development project.

N. "Owner" means the legal or beneficial owner of a site, including but not limited to, a mortgagee or vendee in possession, receiver, executor, trustee, lessee or other person, firm or corporation in control of the site.

O. "Parking lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with a lot size of five thousand square feet or more, or with twenty-five or more parking spaces.

P. "Receiving waters" means any natural stream, river, creek, ditch, channel, canal, waterway, gully, ravine or wash, in and including any adjacent area that is subject to inundation from overflow or flood water.

Q. "Redevelopment" means, on an already developed site, the creation or addition of at least five thousand square feet of impervious surface, or the expansion of a building footprint or addition of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; and land disturbing activities related with structural or impervious surfaces that results in an increase of fifty percent of the impervious surface of a previously existing development.

R. "Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812).

S. "Retail gasoline outlet" means any facility engaged in selling gasoline and lubricating oils.

T. "Site" means any tract, lot or parcel of land or combination of tracts, lots, or parcels of land, which are in one ownership, or are contiguous and in diverse ownership where a development is to be performed as part of a unit, subdivision, or project.

U. "Storm drain" means any pipe, conduit or sewer of the city designed or used for the disposal of storm and surface waters and drainage including unpolluted cooling water and unpolluted industrial process water, but excluding any community sanitary sewer system.

V. "Stormwater management" means the collection, conveyance, storage, treatment and disposal of stormwater runoff to enhance and promote the public health, safety and general welfare.

W. "Stormwater runoff management plan" means a document required pursuant to Section 18.71.120, describing how existing runoff characteristics will be affected by a land development project and containing measures for complying with the provisions of this ordinance.

X. "Stormwater runoff" means water from rain, landscape irrigation, or other sources that flows over the land surface without entering the soil.

Y. "Treatment control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Z. "Watercourse" means any natural or artificial stream, river, creek, ditch, channel, canal, conduit, culvert, drain, waterway, gully, ravine or wash, in and including any adjacent area that is subject to inundation from overflow or flood water.

AA. "Water quality impact" means any deleterious effect on waters or wetlands, including their quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses that are or may potentially be harmful or injurious to human health, welfare, safety or property, to biological productivity, diversity, or stability or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.030 Applicability: Permanent storm water pollution prevention measures required.

A. The provisions of this chapter shall apply to development or redevelopment of the following:

1. One hundred thousand square feet commercial development.
2. Automotive repair shops.
3. Retail gasoline outlets.
4. Restaurants.
5. Hillside residential.
6. Parking lots residential with ten or more units or greater than five thousand square feet of impervious area.
7. Projects requiring a general NPDES permit for stormwater discharges associated with industrial activities.
8. Impervious surfaces ten thousand or more square feet.
9. Impervious surfaces within one hundred feet of receiving waters.
10. Vehicle or equipment fueling, washing, or maintenance area.
11. Commercial or industrial waste handling or storage, excluding typical office or household waste.
12. Development or redevelopment projects disturbing greater than or equal to one acre.

B. No final building or occupancy permit shall be issued without the written certification of the chief engineer or designee that the requirements of this chapter have been satisfied.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.110 Design standards and selection of best management practices.

Projects meeting the criteria of Section 18.71.030A, must meet the requirements of the following design standards and selection of best management practices:

A. Stormwater best management practices shall be selected and designed to the satisfaction of the chief engineer or designee in accordance with the requirements contained in the most recent versions of the following documents:

1. City of Morgan Hill stormwater post construction best management practices development standards for new development and redevelopment;
2. California Storm Water Quality Association Best Management Practice Handbooks;
3. City of Gilroy, City of Morgan Hill and County of Santa Clara Regional Stormwater Management Plan (SWMP), as approved by the Central Coast Regional Water Quality Control Board;
4. City of Morgan Hill Hydro-modification Management Plan, as approved by the Central Coast Regional Water Quality Control Board;

Any conflict of BMPs from the above documents shall be approved by the chief engineer.

B. Other references which can be used for selection of design BMPs to the satisfaction of the chief engineer or designee are:

1. Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) "Guidance for Implementing Stormwater Regulations for New and Redevelopment Projects;"
2. "Start at the Source Design Guidance Manual developed by the Bay Area Storm Water Management Agencies Association (BASMAA);
3. Bay Area Stormwater Management Agencies Association "Using Site Design Standards to Meet Development Standards for Stormwater Quality - A Companion Document to Start at the Source".

C. Design Standards for Structural or Treatment Control BMPs. The post-construction treatment control BMPs shall incorporate, at a minimum, either a volumetric or flow based treatment control design standard, or both, as identified below to mitigate (infiltrate, filter or treat) storm water runoff.

1. Volumetric Treatment Control BMP - Treatment systems depending on volume capacity, such as detention/retention units or infiltration structures, shall be designed to treat stormwater runoff equal to:
   a) The maximized stormwater quality capture volume for the area, based on historical rainfall records, determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175-178 (e.i. approximately the eighty-fifth percentile twenty-four-hour storm runoff event); or
   b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Appendix D of the California Stormwater Best Management Practices Handbook for New Development and Redevelopment (2003), using local rainfall data; or
   c) The volume of runoff produced from a historical-record based reference twenty-four-hour rainfall criterion for "treatment" that achieves approximately the same reduction in pollutant loads achieved by the eighty-fifth percentile twenty-four-hour runoff event.
2. Flow-Based Treatment Control BMP - Treatment BMPs whose primary mode of action depends on flow capacity, such as swales, sand filters, or wetlands, shall be sized to treat:

a) The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the area; or

b) The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

D. Design Standards for Peak Storm Water Runoff Discharge Rates. Post-development peak storm water runoff discharge rates shall not exceed the estimated pre development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.120 Stormwater runoff management plan required.

Projects meeting the criteria of Section 18.71.030A must provide a stormwater runoff management plan. The stormwater runoff management Plan shall detail how runoff and associated water quality impacts resulting from the activity will be controlled or managed by the project's post construction BMP designs.

No building permit shall be issued until the stormwater runoff management plan has been reviewed and approved by the chief engineer or designee.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.130 Stormwater runoff management plan contents.

The stormwater runoff management plan shall include sufficient information to evaluate the environmental characteristics of affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The minimum information submitted for support of the stormwater management plan shall meet the requirements as outlined in City of Morgan Hill Stormwater Post Construction Best Management Practices Development Standards for New Development and Redevelopment manual.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.140 Preparation of the stormwater runoff management plan.

A. The stormwater runoff management plan shall be prepared under the direction of a professional civil engineer registered in the State of California. The responsible professional civil engineer shall stamp and sign the approved stormwater runoff management plan.

B. The chief engineer or designee may require a developer to provide a signed certification from the civil engineer responsible for preparing the stormwater runoff management plan that all stormwater best management practices have been designed to meet the requirements of this chapter.

C. Each certifying civil engineer shall establish to the city's satisfaction that such person has been trained on the design of stormwater quality best management practices not more than three years prior to the certification signature date.

D. Qualifying training shall be conducted by an organization with stormwater quality management expertise, such as a university, the Bay Area Stormwater Management Agencies Association, the American Society of Civil Engineers, the American Public Works Association, or the California Water Environment Association.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.150 Stormwater BMP operation, maintenance, and replacement responsibility.

A. For the life of projects meeting the criteria of Section 18.71.030A, all on-site stormwater management facilities shall be operated and maintained in good condition and promptly repaired/replaced by the property owner(s), an owners' or homeowners' association or other legal entity approved by the city.

B. Any repairs or restoration/replacement and maintenance shall be in accordance with city-approved plans.

C. The property owner(s) shall develop a maintenance schedule for the life of any stormwater management facility and shall describe the maintenance to be completed, the time period for completion, and who shall perform the maintenance. This maintenance schedule shall be included with the approved stormwater runoff management plan.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.160 Stormwater BMP operation and maintenance agreement.

A. Prior to the issuance of any building permit requiring stormwater management BMPs, the owner(s) of the site shall enter into a formal written stormwater BMP operation and maintenance agreement with the city. The city shall record this agreement, against the property or properties involved, with the County of Santa Clara and it shall be binding on all subsequent owners of land served by the stormwater management treatment BMPs.

B. The stormwater BMP operation and maintenance agreement shall require that the BMPs not be modified and that BMP maintenance activities not alter the designed function of the facility from its original design unless approved by the city prior to the commencement of the proposed modification or maintenance activity.

C. The stormwater BMP operation and maintenance agreement shall provide that in the event that maintenance or repair is neglected, or the stormwater management facility becomes a danger to public health or safety, the city shall have the authority to perform maintenance and/or repair work and to recover the costs from the owner.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.170 Stormwater BMP inspection responsibility.

A. The property owner(s) shall be responsible for having all stormwater management facilities inspected for condition and function by a knowledgeable party.

B. Unless otherwise required by the chief engineer or designee, stormwater facility inspections shall be done at least twice per year, once in fall, in preparation for the wet season, and once in winter. Written records shall be kept of all inspections and shall include, at minimum, the following information:

1. Site address;
2. Date and time of inspection;
3. Name of the person conducting the inspection;
4. List of stormwater facilities inspected;
5. Condition of each stormwater facility inspected;
6. Description of any needed maintenance or repairs; and
7. As applicable, the need for site reinspection.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.180 Records of maintenance and inspection activities.

On or before April 15th of each year, the party responsible for the operation and maintenance of on-site stormwater management facilities under the BMP operation and maintenance agreement shall provide the chief engineer or designee with records of all inspections, maintenance and repairs.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.190 Failure to maintain.

A. If the responsible party fails or refuses to meet the requirements of the stormwater BMP operation and maintenance agreement, the authorized enforcement officer may give a thirty-day written notice to such responsible party under BMP operation and maintenance agreement to correct the failure and breach of contractual obligation.

B. If such responsible party fails to correct such conditions, the city may take such remedies such provided in the BMP operation and maintenance agreement. Additionally, such conditions shall be deemed a nuisance subject to all procedures, abatement of such conditions and remedies as provided in Chapter 1.18 of this code.

C. In the event the city determines that the violation constitutes an immediate danger to public health or public safety, twenty-four hours written notice from the city shall be sufficient in lieu of the thirty-day written notice required under Section 18.71.190A.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.200 Authority to inspect.

Whenever necessary to make an inspection to enforce any provision of this chapter, or whenever the authorized enforcement officer has cause to believe that there exists, or potentially exists, in or upon any premises any condition which constitutes a violation of this chapter, the authorized enforcement officer may enter such premises at all reasonable times to inspect the same and to inspect and copy records related to storm water compliance provided that (i) if such building or premises be occupied, he or she shall first present proper credentials and request entry; and (ii) if such building or premises be unoccupied, he or she shall first make a reasonable effort to locate the owner or other persons having charge or control of the building or premises and request entry. In the event the owner or occupant refuses entry after a request to enter and inspect has been made, the city is hereby empowered to seek assistance from any court of competent jurisdiction in obtaining such entry.

In any circumstance where there appears an immediate threat to the public health or safety, the authorized enforcement officer may enter any structure or premises without the consent of any person or court process.

Routine or area inspections shall be based upon such reasonable selection processes as may be deemed necessary to carry out the objectives of this chapter, including but not limited to random sampling and/or sampling in areas with evidence of storm water contamination, illicit discharges, discharges of non-storm water to the storm water system, or similar factors.

The city shall have the right to establish on any property such devices as are necessary to conduct sampling or metering operations. During any inspection as provided herein, the authorized enforcement officer may take any samples and perform any testing deemed necessary to aid in the pursuit of the inquiry or to record site activities.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.210 Notice of violation.

Whenever the authorized enforcement officer finds that a person has violated a prohibition or failed to meet a requirement of this chapter, the authorized enforcement officer may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

A. The performance of monitoring, analyses, and reporting;

B. The elimination of illicit connections or discharges;

C. That violating discharges, practices, or operations shall cease and desist;

D. The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;

E. Payment of a fine to cover administrative and remediation costs; and

F. The implementation of BMP, source control or treatment BMPs;

G. Compliance with the stormwater runoff management plan and the BMP operation and maintenance agreement.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by the city or a contractor designated by the authorized enforcement officer and the expense thereof shall be charged to the violator pursuant to Section 18.71.240.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.220 Appeal.

Any person receiving a notice of violation under Section 18.71,210, above may appeal the determination of the authorized enforcement officer to the city manager. The notice of appeal must be received by the city manager within five days from the date of the notice of violation. Hearing on the appeal before the city manager or his/her designee shall take place within fifteen days from the date of city's receipt of the notice of appeal. The decision of the city manager or designee shall be final.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.230 Abatement by city.

If the violation has not been corrected pursuant to the requirements set forth in the notice of violation, or, in the event of an appeal under Section 18.71.220, within ten days of the decision of the city manager upholding the decision of the authorized enforcement officer, then the city or a contractor designated by the authorized enforcement officer may enter upon the subject private property and is authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the city or designated contractor to enter upon the premises for the purposes set forth above.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.240 Charging cost of abatement.

Within 30 days after abatement of the nuisance by city, the authorized enforcement officer shall notify the property owner of the property of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment with the city clerk within fifteen

days. The city clerk shall set the matter for public hearing by the city council. The decision of the city council shall be set forth by resolution and shall be final.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.250 Urgency abatement.

The authorized enforcement officer is authorized to require immediate abatement of any violation of this chapter that constitutes an immediate threat to the health, safety or well-being of the public. If any such violation is not abated immediately as directed by the authorized enforcement officer, the city is authorized to enter onto private property and to take any and all measures required to remediate the violation. Any expense related to such remediation undertaken by the city o shall be fully reimbursed by the property owner and/or responsible party. Any relief obtained under this section shall not prevent city from seeking other and further relief authorized under this chapter.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.260 Violations.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this chapter. A violation of or failure to comply with any of the requirements of this chapter shall constitute a misdemeanor and shall be punished as set forth in Chapter 1.24 of this code.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.270 Compensatory action.

In lieu of enforcement proceedings, penalties, and remedies authorized by this chapter, the authorized enforcement officer may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.280 Violations deemed a public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken by the city pursuant to Chapter 1.18 of this code.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.290 Acts potentially resulting in a violation of the Federal Clean Water Act and/or California Porter-Cologne Act.

Any person who violates any provision of this chapter or any provision of any requirement issued pursuant to this chapter may also be in violation of the Clean Water Act and/or the Porter-Cologne Act and may be subject to the sanctions of those acts including civil and criminal penalties. Any enforcement action authorized under this chapter shall also include written notice to the violator of such potential liability.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

18.71.300 Fees set by resolution.

The city council shall establish, by resolution, any fees necessary to carry out the purpose of this chapter.

(Ord. No. 1993 N.S., § 1, 10-6-2010)

Appendix I

Drainage Analysis and Stormwater Management Calculations

Drainage Analysis &
Storm Water Management Calculations
for:
Black Rock - 14 Single Family Detached
APN's 779-02-023
Watsonvile Road - Morgan Hill, CA
Job#25268.5 Revised: May 22, 2023

Prepared by:
Arman Nazemi, PE
Lic. No. CE 55927
MH Engineering Company

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Spring View - APN 767-11-030
Job#: 98043
Date: 10/11/2020
Revised: 2/16/2023
Project Description:

The project is located in Morgan Hill at southerly quadrant of Santa Teresa Blvd. and Watsonville Road intersection in Residential Planned Development RPD zoning. The project proposes 14 detached residential lots on 683,476 square foot of buildable area. The parcel has frontage along the Llagas Creek with adequate setback designated for flood way. Due to larger footprint of each lot, the site is divided into 30 separate Drainage Management Area, DMAs. Each DMA is provided along the side yards and backyards with a bio-swales with detention facility. Due to lack of infiltration along with lack of a minimum 10 feet separation to high seasonal ground water (water table is found within 8 to 10 feet from the surface per Earth System soil report), the project falls under technical infeasibility. As a result the drainage design is based on providing quality treatment for 10 percent equivalent impervious surface area in compliance with C3 stormwater guidelines. Each lot is proposed to designate bio-swales treatment area for a minimum of 10 percent equivalent impervious surface areas. The site will detain excess surface runoff due to new development within bio-swale areas and after processing quality treatment it will release it at less than or equal to pre-development level in compliance with hydro-modification requirements for all storms up to 100 year event. Furthermore; in order to size the required detention facilities an additional 74,538 sf of hardscape assumption was distributed among all lots proportion to the lot size. This is in addition to proposed hard surfaces depicted on the proposed tentative improvement plans that includes, building site, driveways, sidewalk, road frontage and internal streets improvements. This conservative assumption was to account for future home improvements within their lot which may not require going through permitting requirements. The excess runoff during the peak of the storm will be captured, detained and conveyed through 18 “storm drain pipe that discharges into the existing 60” diameter public storm drain system that flows to the Llagas Creek. This project falls within Central Coast region 3 part of the Monterey Watershed.

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MH engineering Co.
16075 Vineyard Blvd., Morgan Hill, CA 95037 - (408) 779-7381

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

EISA Calculations

Post Construction Storm Water Management Calculations
Per Resolution No. R3-2013-0032

1.) Determination of the Retention Tributary Area

a.)

Impervious Areas									
	Pre-Development			Post-Development					
				Replaced			New		
DMA	Roof	PCC	AC	Roof	PCC	AC	Roof	PCC	AC
1	0	0	0	0	0	0	1,538	9,432	11,829
2	0	0	0	0	0	0	1,739	3,760	0
3	0	0	0	0	0	0	2,788	3,250	0
4	0	0	0	0	0	0	469	4,546	0
5	0	0	0	0	0	0	2,662	3,369	0
6	0	0	0	0	0	0	626	4,120	0
7	0	0	0	0	0	0	1,609	4,098	0
8	0	0	0	0	0	0	2,690	8,534	9,343
9	0	0	0	0	0	0	4,704	5,030	0
10	0	0	0	0	0	0	0	5,203	3,900
11	0	0	0	0	0	0	2,377	3,756	3,928
12	0	0	0	0	0	0	2,767	3,766	0
13	0	0	0	0	0	0	1,823	1,136	0
14	0	0	0	0	0	0	1,308	2,070	0
15	0	0	0	0	0	0	926	5,247	0
16	0	0	0	0	0	0	2,416	2,711	0
17	0	0	0	0	0	0	1,910	2,168	0
18	0	0	0	0	0	0	3,428	5,054	0
19	0	0	0	0	0	0	1,641	8,610	12,356
20	0	0	0	0	0	0	2,991	4,403	0
21	0	0	0	0	0	0	3,523	3,831	0
22	0	0	0	0	0	0	1,621	5,292	0
23	0	0	0	0	0	0	2,748	6,471	0
24	0	0	0	0	0	0	1,551	2,617	0
25	0	0	0	0	0	0	1,334	2,807	0
185	0	0	0	0	0	0	1,719	4,387	0
186	0	0	0	0	0	0	878	4,487	0
187	0	0	0	0	0	0	1,882	10,870	16,407
29	0	0	0	0	0	0	512	2,683	3,850
30	0	0	0	0	0	0	583	3,367	5,082
							56,761	137,077	66,694

Pervious vs Impervious Areas									
		Pre-Development		Post-Development					
					Impervious			i	C
DMA	Total Area	Pervious	Impervious	Pervious	Replaced	New	Total		
1	42,819	42,819	0	20,021	0	22,799	22,799	0.53	0.36
2	21,606	21,606	0	16,107	0	5,499	5,499	0.25	0.20
3	23,914	23,914	0	17,876	0	6,038	6,038	0.25	0.20
4	19,428	19,428	0	14,413	0	5,015	5,015	0.26	0.20
5	21,606	21,606	0	15,575	0	6,031	6,031	0.28	0.21
6	21,301	21,301	0	16,555	0	4,746	4,746	0.22	0.18
7	18,121	18,121	0	12,414	0	5,707	5,707	0.31	0.23
8	43,516	43,516	0	22,950	0	20,567	20,567	0.47	0.32
9	39,030	39,030	0	29,296	0	9,734	9,734	0.25	0.20
10	17,468	17,468	0	8,365	0	9,102	9,102	0.52	0.35
11	17,206	17,206	0	7,145	0	10,061	10,061	0.58	0.40
12	15,333	15,333	0	8,801	0	6,533	6,533	0.43	0.29
13	6,752	6,752	0	3,793	0	2,959	2,959	0.44	0.30
14	11,326	11,326	0	7,948	0	3,377	3,377	0.30	0.22
15	26,528	26,528	0	20,355	0	6,173	6,173	0.23	0.19
16	20,473	20,473	0	15,346	0	5,127	5,127	0.25	0.20
17	16,814	16,814	0	12,736	0	4,078	4,078	0.24	0.19
18	26,571	26,571	0	18,089	0	8,482	8,482	0.32	0.24
19	37,462	37,462	0	14,855	0	22,607	22,607	0.60	0.41
20	21,127	21,127	0	13,733	0	7,394	7,394	0.35	0.25
21	26,310	26,310	0	18,956	0	7,354	7,354	0.28	0.21
22	18,513	18,513	0	11,600	0	6,913	6,913	0.37	0.26
23	23,435	23,435	0	14,216	0	9,219	9,219	0.39	0.28
24	20,473	20,473	0	16,305	0	4,168	4,168	0.20	0.17
25	21,127	21,127	0	16,986	0	4,141	4,141	0.20	0.17
26	22,520	22,520	0	16,415	0	6,105	6,105	0.27	0.21
27	20,952	20,952	0	15,588	0	5,365	5,365	0.26	0.20
28	46,939	46,939	0	17,780	0	29,159	29,159	0.62	0.43
29	11,674	11,674	0	4,629	0	7,045	7,045	0.60	0.41
30	12,866	12,866	0	3,834	0	9,032	9,032	0.70	0.50
Total	693,210	693,210	0	432,678	0	260,531	260,531	0.38	0.27

A_{total} = drainage area (sf)

A_{roofs} = roof areas (sf)

$A_{pcc\text{-}walks/parking}$ = area of pcc walks & parking lot

$A_{pcc\ -streets}$ = area of pcc walks and curbs (sf)

$A_{AC\text{-}streets}$ = Street pavement areas (sf)

$A_{pervious}$ = Planted & Open Areas (sf)

$A_{impervious}$ = total impervious roof areas, PCC areas & AC areas (sf)

i = fraction of the tributary area that is impervious = $A_{impervious} / A_{area}$

$C_{area\#}$ = Area runoff coefficient=C = $0.858i^3 - 0.78i^2 + 0.774i + 0.04$

b.) Correction Factors

Surface Type		Correction Factor
AC		1.00
PCC		1.00
Roofs		1.00
Disturbed Soils/Managed Turf (dependent on original hydrologic soil group)	Soil Group A	0.15
	Soil Group B	0.20
	Soil Group C	0.22
	Soil Group D	0.25
Pervious PCC		0.60
Cobbles		0.60
Pervious AC		0.55
Natural Stone (without grout)		0.25
Turf Block		0.15
Brick (without grout)		0.13
Unit Pavers on Sand		0.10
Crushed Aggregate		0.10
Grass/Other Landscaping		0.10

c) Required Treatment Sizing Calculations

DMA	Total DMA Area (SF)	Impervious Area				EISA (SF)	Required Treatment Area (SF)	Provided Treatment Area (SF)
		Roof (SF)	PCC (SF)	AC (SF)	Landscape (SF)			
		CF: 1.00	CF: 1.00	CF: 1.00	CF: 0.10			
1	42,819	1,538	9,432	11,829	20,021	24,801	2,242	2,385
2	21,606	1,739	3,760	0	16,107	7,110	643	680
3	23,914	2,788	3,250	0	17,876	7,826	711	720
4	19,428	469	4,546	0	14,413	6,456	586	600
5	21,606	2,662	3,369	0	15,575	7,589	681	780
6	21,301	626	4,120	0	16,555	6,402	576	640
7	18,121	1,609	4,098	0	12,414	6,948	631	640
8	43,516	2,690	8,534	9,343	22,950	22,862	2,065	2,210
9	39,030	4,704	5,030	0	29,296	12,663	1,147	1,190
10	17,468	0	5,203	3,900	8,365	9,939	892	1,020
11	17,206	2,377	3,756	3,928	7,145	10,775	973	1,050
12	15,333	2,767	3,766	0	8,801	7,413	666	750
13	6,752	1,823	1,136	0	3,793	3,338	298	360
14	11,326	1,308	2,070	0	7,948	4,172	371	460
15	26,528	926	5,247	0	20,355	8,209	741	800
16	20,473	2,416	2,711	0	15,346	6,662	598	680
17	16,814	1,910	2,168	0	12,736	5,352	475	600
18	26,571	3,428	5,054	0	18,089	10,291	929	1,000
19	37,462	1,641	8,610	12,356	14,855	24,093	2,184	2,250
20	21,127	2,991	4,403	0	13,733	8,767	789	875
21	26,310	3,523	3,831	0	18,956	9,249	840	850
22	18,513	1,621	5,292	0	11,600	8,073	732	750
23	23,435	2,748	6,471	0	14,216	10,641	964	1,000
24	20,473	1,551	2,617	0	16,305	5,799	524	560
25	21,127	1,334	2,807	0	16,986	5,840	526	580
26	22,520	1,719	4,387	0	16,415	7,747	711	640
27	20,952	878	4,487	0	15,588	6,923	636	560
28	46,939	1,882	10,870	16,407	17,780	30,937	2,809	2,850
29	11,674	512	2,683	3,850	4,629	7,508	681	700
30	12,866	583	3,367	5,082	3,834	9,415	847	950
Total	693,210	56,761	137,077	66,694	432,678	303,799	27,467	29,130

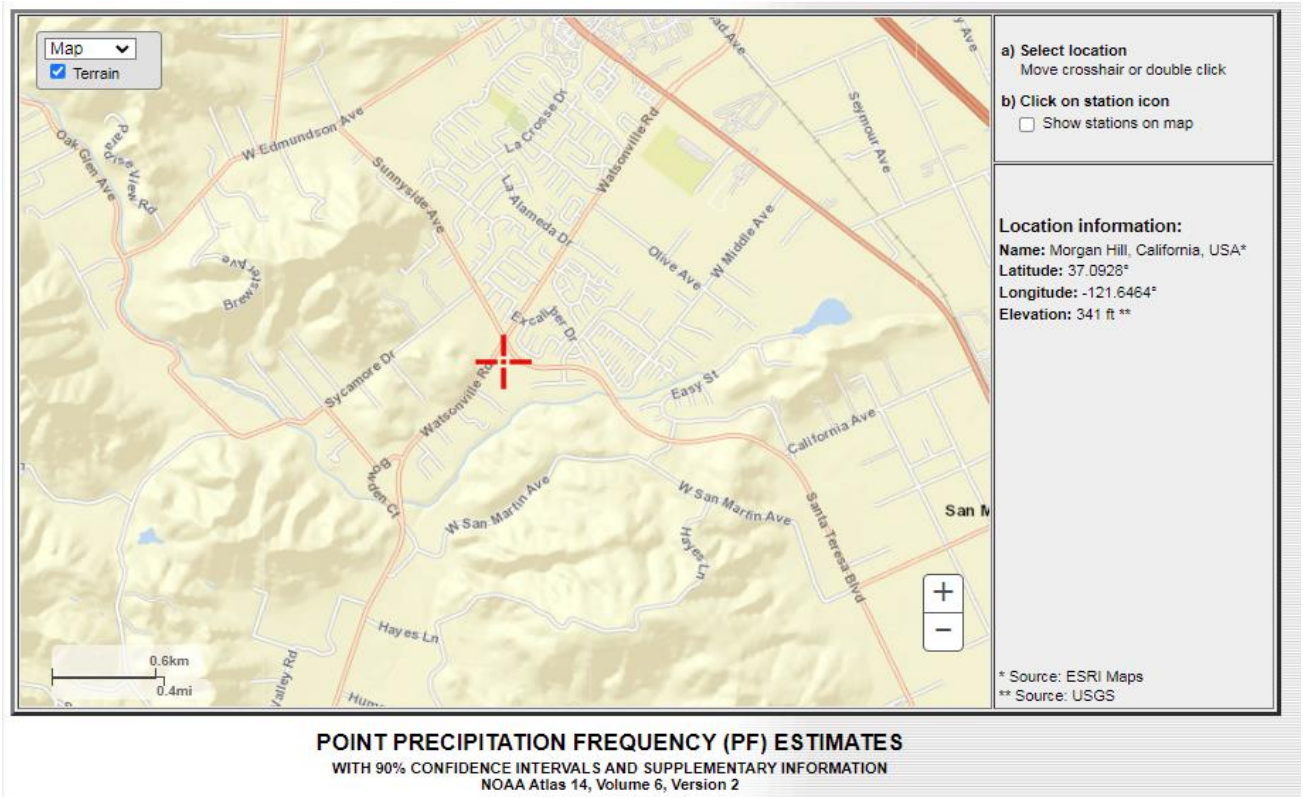
EISA = Equivalent Impervious Surface Area = Sum of Surface Area x Correction Factor
Required Treatment Area = (EISA - Provided Treatment Area) x 0.10

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

Attachment E:
Project Rainfall Data

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

Rainfall Data



POINT PRECIPITATION FREQUENCY (PF) ESTIMATES
WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

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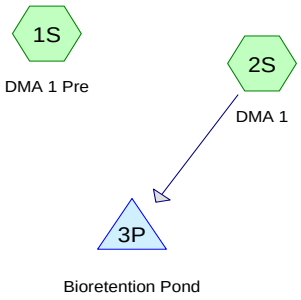
Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

SCS Routing

DMA 1 Event Summary



Events for Subcatchment 1S: Pre Development

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.44
1 year	2.21	0.13	0.053	0.65
2 year	2.90	0.21	0.091	1.12
5 year	3.84	0.33	0.150	1.83
10 year	4.62	0.43	0.203	2.48
25 year	5.72	0.57	0.281	3.43
50 year	6.59	0.68	0.345	4.21
100 year	**7.49**	**0.79**	**0.412**	**5.03**

Events for Subcatchment 2S: DMA 1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.16	0.074	0.90
2 year	2.90	0.29	0.148	1.81
5 year	3.84	0.41	0.219	2.67
10 year	4.62	0.51	0.279	3.41
25 year	5.72	0.64	0.366	4.46
50 year	6.59	0.75	0.435	5.31
100 year	**7.49**	**0.86**	**0.507**	**6.19**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.14	0.08	0.08	**0.00**	336.44	582
2 year	0.27	0.13	0.13	0.00	337.39	1,485
5 year	0.39	0.26	0.26	0.00	339.57	2,323
10 year	0.49	0.39	0.39	0.00	339.96	2,688
25 year	0.63	0.54	0.54	0.00	340.08	2,992
50 year	0.74	0.68	0.68	0.00	340.14	3,122
100 year	**0.85**	**0.80**	**0.80**	0.00	**340.18**	**3,214**

7/3/1900

DMA 1 Pre-Development

Summary for Subcatchment 1S: DMA 1 Pre

Runoff = 0.79 cfs @ 18.14 hrs, Volume= 0.412 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
42,819	79	50-75% Grass cover, Fair, HSG C
42,819		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct**

DMA 1 Post-Development

Summary for Subcatchment 2S: DMA 1

Runoff = 0.86 cfs @ 18.19 hrs, Volume= 0.507 af, Depth= 6.19"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	22,801	98	Roadways
*	20,018	79	Sagebrush range, Poor, HSG B
	42,819	89	Weighted Average
	20,018		46.75% Pervious Area
	22,801		53.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 1 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.983 ac, 53.25% Impervious, Inflow Depth = 5.95" for 100 year event
Inflow = 0.85 cfs @ 18.19 hrs, Volume= 0.488 af
Outflow = 0.80 cfs @ 18.37 hrs, Volume= 0.488 af, Atten= 5%, Lag= 10.7 min
Primary = 0.80 cfs @ 18.37 hrs, Volume= 0.488 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 340.18' @ 18.37 hrs Surf.Area= 2,385 sf Storage= 3,214 cf

Plug-Flow detention time= 131.3 min calculated for 0.488 af (100% of inflow)
Center-of-Mass det. time= 131.2 min (1,066.5 - 935.4)

Volume	Invert	Avail.Storage	Storage Description
#1	335.83'	10,868 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

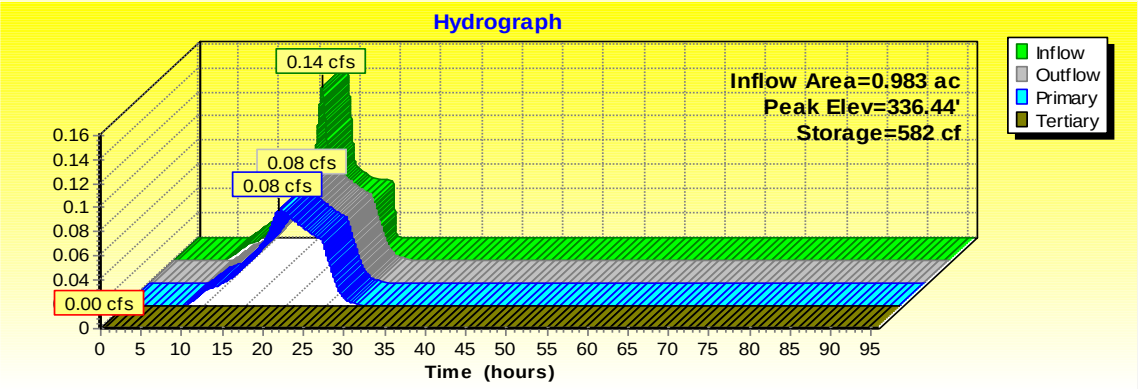
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
335.83	2,385	0.0	0	0
335.84	2,385	40.0	10	10
337.83	2,385	40.0	1,898	1,908
337.84	2,385	10.0	2	1,910
339.83	2,385	10.0	475	2,385
340.33	2,385	100.0	1,193	3,578
340.83	3,216	100.0	1,400	4,978
341.83	4,065	100.0	3,641	8,618
342.33	4,932	100.0	2,249	10,868

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.33'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.33'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	335.83'	**1.0" Vert. Orifice X 4.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	339.80'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	339.20'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#5	Primary	340.05'	**2.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.80 cfs @ 18.37 hrs HW=340.18' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.22 cfs @ 9.99 fps)
- **3=Orifice** (Orifice Controls 0.24 cfs @ 2.42 fps)
- **4=Orifice** (Orifice Controls 0.10 cfs @ 4.55 fps)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.96 fps)

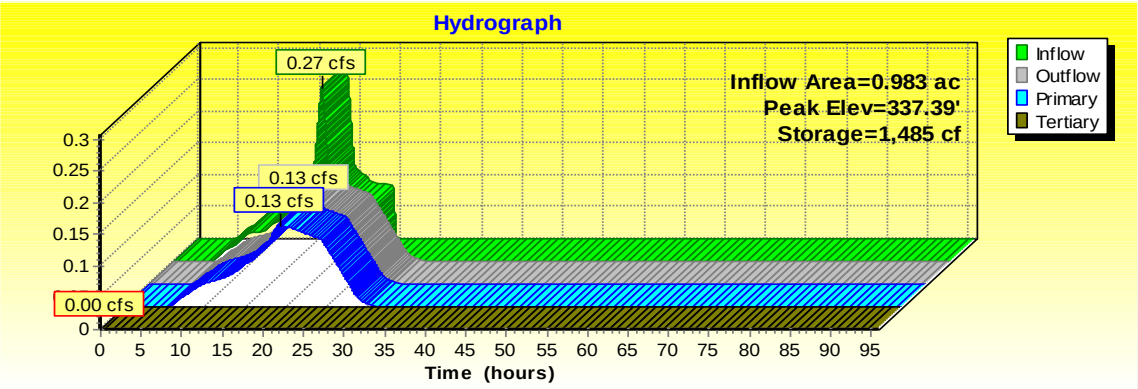
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=335.83' (Free Discharge)

DMA 1 95th% Event



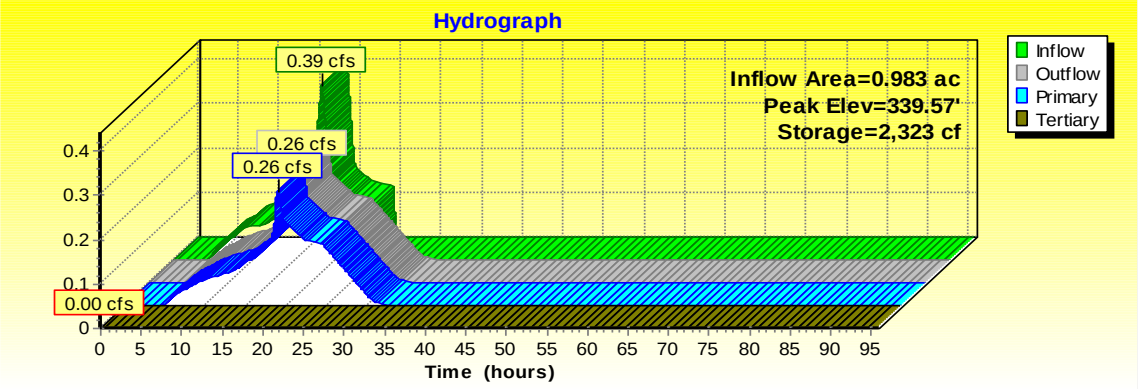
Note: 0 cfs discharge for 95th% event
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via Water Quality Control Outlet
Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 1 2-year Event



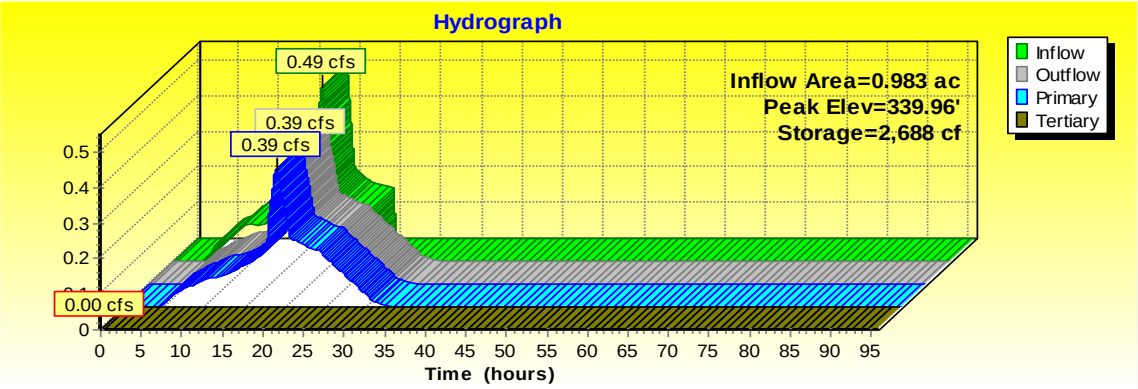
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 5-year Event



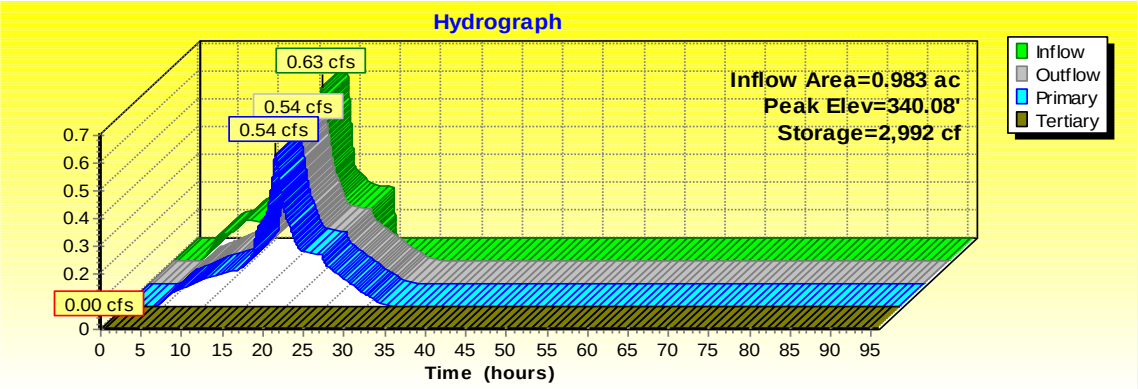
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 10-year Event



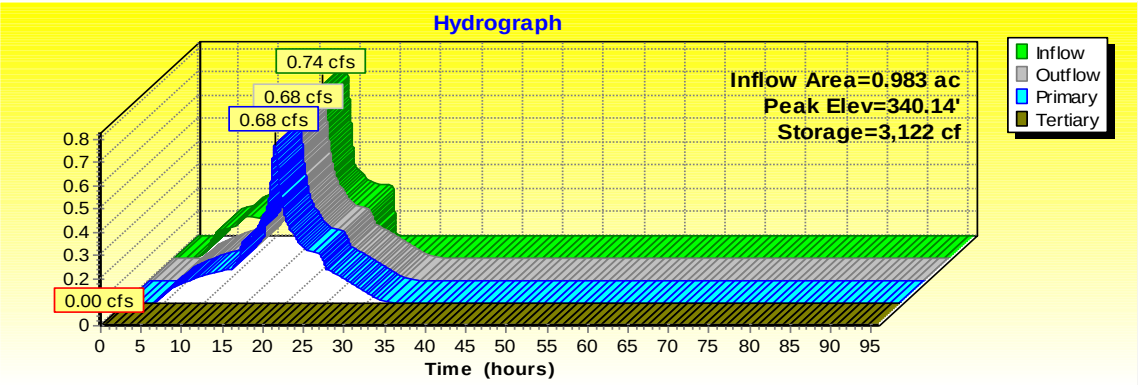
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 25-year Event



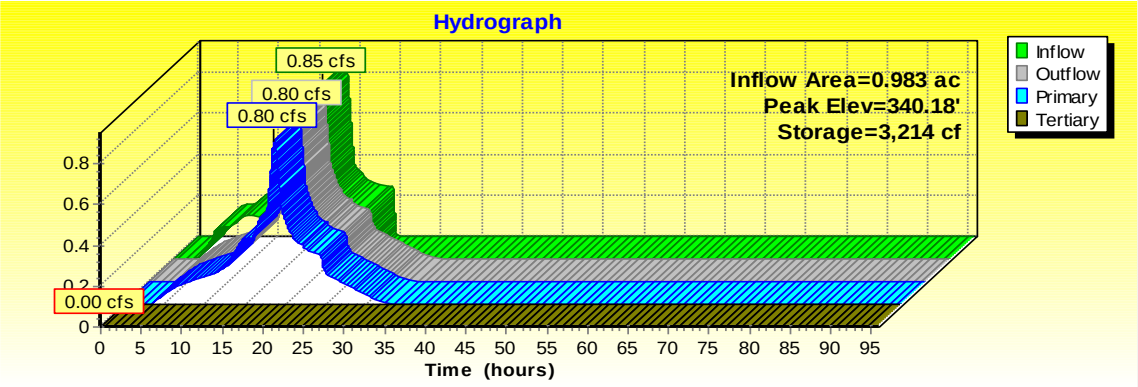
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 50-year Event



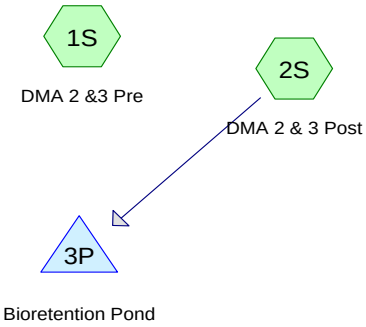
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 1 100-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via overflow bio-pond inlet
Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 Event Summary



Events for Subcatchment 1S: DMA 2 &3 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.041	0.47
2 year	2.90	0.23	0.102	1.18
5 year	3.84	0.36	0.166	1.91
10 year	4.62	0.46	0.223	2.56
25 year	5.72	0.61	0.307	3.53
50 year	6.59	0.73	0.376	4.32
100 year	**7.49**	**0.86**	**0.448**	**5.15**

Events for Subcatchment 2S: DMA 2 & 3 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.041	0.47
2 year	2.90	0.23	0.102	1.18
5 year	3.84	0.35	0.166	1.91
10 year	4.62	0.46	0.223	2.56
25 year	5.72	0.61	0.307	3.53
50 year	6.59	0.72	0.376	4.32
100 year	**7.49**	**0.84**	**0.448**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.10	0.10	0.10	**0.00**	336.69	94
2 year	0.23	0.21	0.21	0.00	336.85	186
5 year	0.35	0.32	0.32	0.00	337.09	322
10 year	0.46	0.40	0.40	0.00	337.36	469
25 year	0.61	0.51	0.51	0.00	337.81	722
50 year	0.72	0.67	0.67	0.00	338.05	859
100 year	**0.84**	**0.80**	**0.80**	0.00	**338.22**	**952**

DMA 2 & 3 Pre-Development

Summary for Subcatchment 1S: DMA 2 &3 Pre

Runoff = 0.86 cfs @ 18.14 hrs, Volume= 0.448 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
45,520	80	>75% Grass cover, Good, HSG D
45,520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 2 & 3 Post-Development

Summary for Subcatchment 2S: DMA 2 & 3 Post

Runoff = 0.84 cfs @ 18.21 hrs, Volume= 0.448 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	11,537	98	Roofs
	33,983	74	>75% Grass cover, Good, HSG C
	45,520	80	Weighted Average
	33,983		74.66% Pervious Area
	11,537		25.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 2 & 3 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.045 ac, 25.34% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.84 cfs @ 18.21 hrs, Volume= 0.448 af
Outflow = 0.80 cfs @ 18.38 hrs, Volume= 0.448 af, Atten= 6%, Lag= 9.9 min
Primary = 0.80 cfs @ 18.38 hrs, Volume= 0.448 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 338.22' @ 18.38 hrs Surf.Area= 1,400 sf Storage= 952 cf

Plug-Flow detention time= 18.0 min calculated for 0.448 af (100% of inflow)
Center-of-Mass det. time= 17.8 min (991.5 - 973.7)

Volume	Invert	Avail.Storage	Storage Description
#1	336.52'	4,464 cf	**DMA 3 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.52'	3,657 cf	**DMA 2 Bio-swale (Prismatic)** Listed below (Recalc)
		8,122 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.52	720	0.0	0	0
336.53	720	40.0	3	3
338.52	720	40.0	573	576
338.53	720	10.0	1	577
340.52	720	10.0	143	720
340.53	720	100.0	7	727
341.02	1,281	100.0	490	1,217
341.52	1,860	100.0	785	2,003
342.02	2,457	100.0	1,079	3,082
342.52	3,072	100.0	1,382	4,464

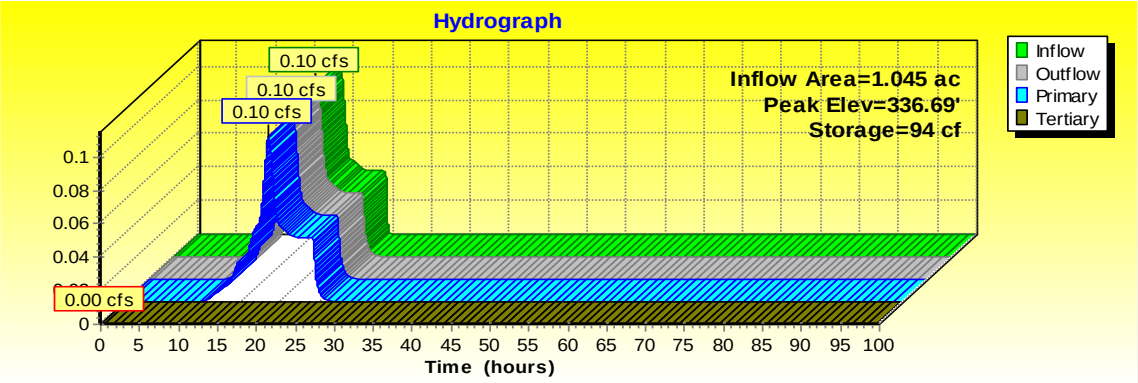
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.52	680	0.0	0	0
336.53	680	40.0	3	3
338.52	680	40.0	541	544
338.53	680	10.0	1	545
340.52	680	10.0	135	680
340.53	680	100.0	7	687
341.02	1,211	100.0	463	1,150
342.02	1,760	100.0	1,486	2,636
342.52	2,327	100.0	1,022	3,657

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.52'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	336.52'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	341.02'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.82'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.80 cfs @ 18.38 hrs HW=338.22' (Free Discharge)
- **1=Orifice** (Orifice Controls 0.59 cfs @ 6.04 fps)
- **2=Grate** (Controls 0.00 cfs)
- **3=Orifice** (Orifice Controls 0.20 cfs @ 2.33 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.52' (Free Discharge)

DMA 2 & 3 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = No flow out at this storm event

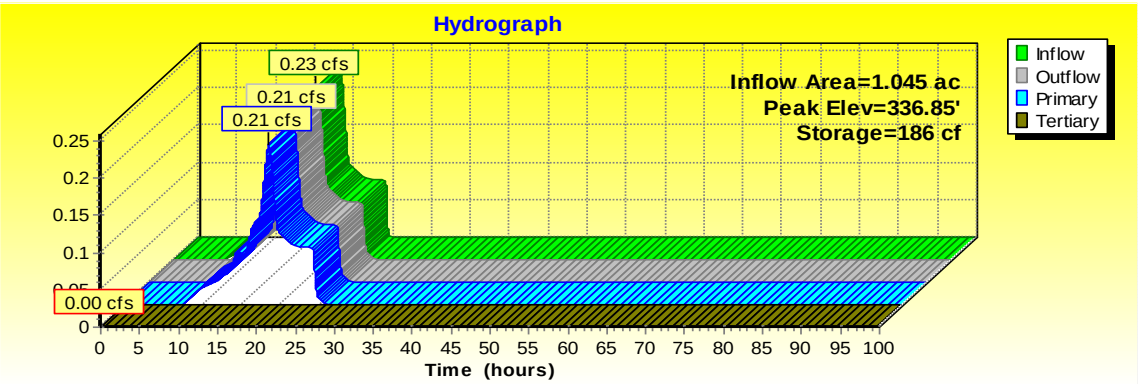
Tertiary = Occurs when water surface elevation exceeds top of bank

Note 1: A full dewatering of subsurface retention occurs in 36 hours after storm

Note 2: Surface pond storage empties in 11 hours after storm < 48 hours ✓ Okay for vector control

Note 3: Since the pond draw down exceeded 88 hours, pond is provided with additional 20% volume

DMA 2 & 3 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

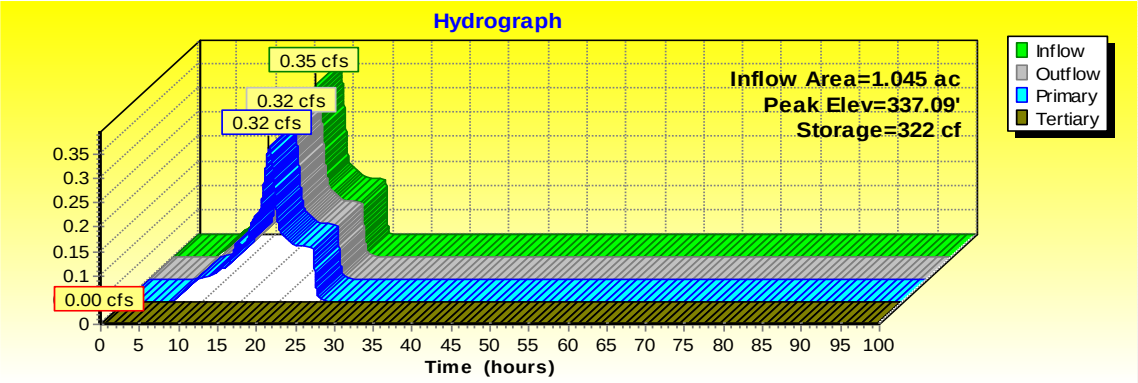
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

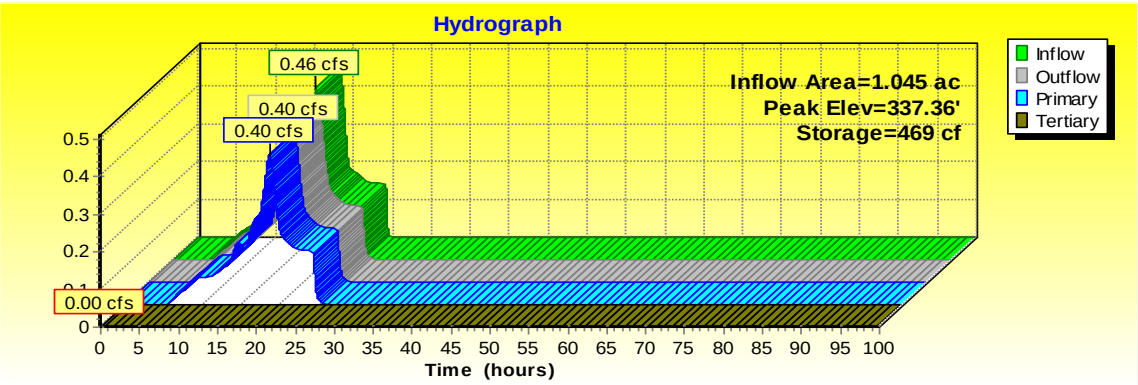
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 &3 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

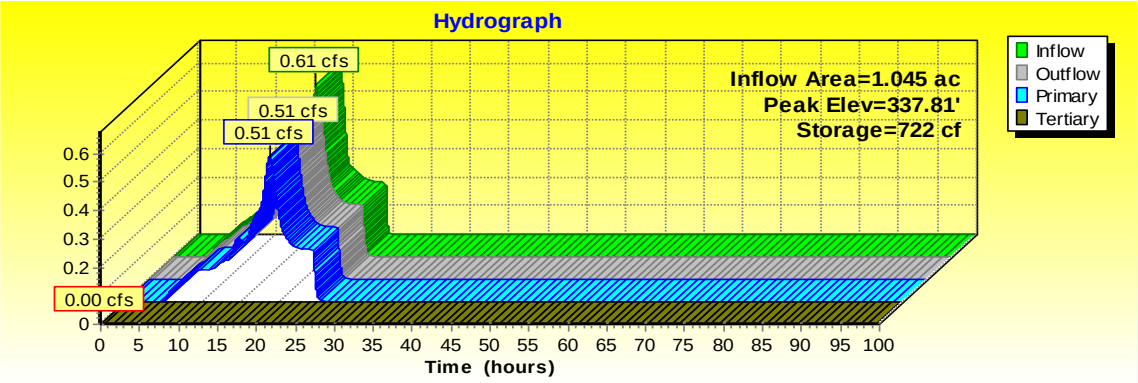
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

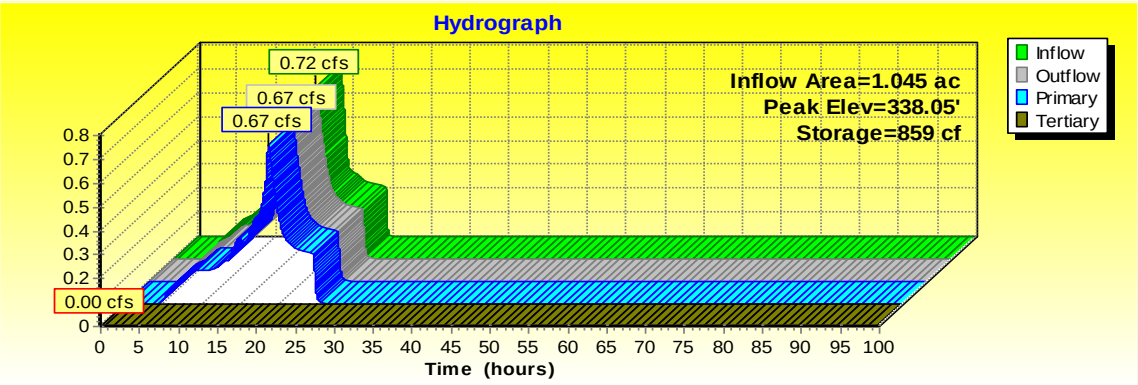
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

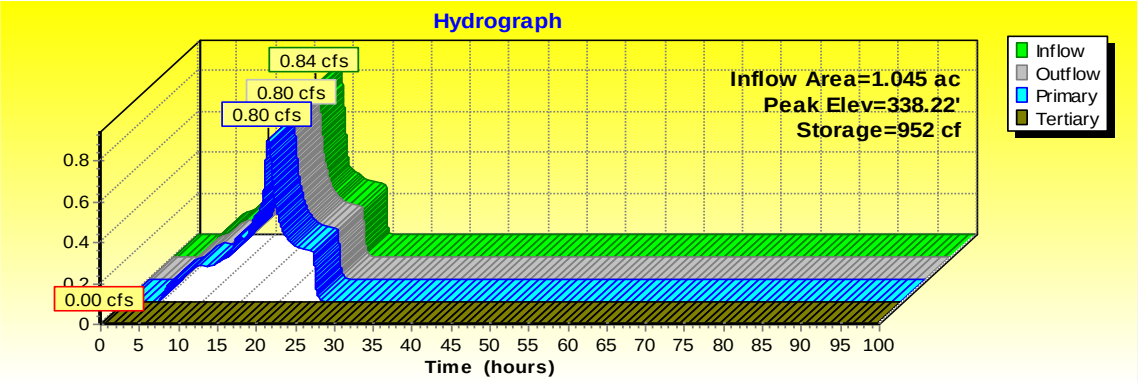
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 2 & 3 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

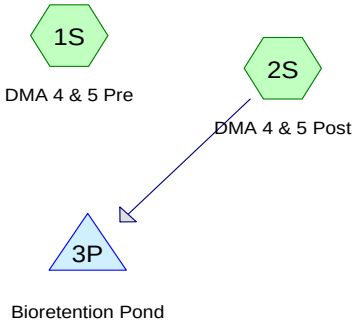
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 Event Summary



Events for Subcatchment 1S: DMA 4 & 5 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.037	0.47
2 year	2.90	0.21	0.092	1.18
5 year	3.84	0.32	0.150	1.91
10 year	4.62	0.42	0.201	2.56
25 year	5.72	0.55	0.277	3.53
50 year	6.59	0.66	0.339	4.32
100 year	**7.49**	**0.77**	**0.404**	**5.15**

Events for Subcatchment 2S: DMA 4 & 5 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.037	0.47
2 year	2.90	0.21	0.092	1.18
5 year	3.84	0.32	0.150	1.91
10 year	4.62	0.41	0.201	2.56
25 year	5.72	0.55	0.277	3.53
50 year	6.59	0.65	0.339	4.32
100 year	**7.49**	**0.76**	**0.404**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	336.90	127
2 year	0.21	0.16	0.16	0.00	337.34	368
5 year	0.32	0.23	0.23	0.00	337.94	700
10 year	0.41	0.28	0.28	0.00	338.56	1,042
25 year	0.55	0.52	0.52	0.00	339.52	1,222
50 year	0.65	0.63	0.63	0.00	340.02	1,290
100 year	**0.76**	**0.76**	**0.76**	0.00	**340.08**	**1,298**

DMA 4 & 5 Pre-Development

Summary for Subcatchment 1S: DMA 4 & 5 Pre

Runoff = 0.77 cfs @ 18.14 hrs, Volume= 0.404 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-125.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
41,034	80	>75% Grass cover, Good, HSG D
41,034		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 4 & 5 Post-Development

Summary for Subcatchment 2S: DMA 4 & 5 Post

Runoff = 0.76 cfs @ 18.21 hrs, Volume= 0.404 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-125.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	11,046	98	Roofs
	29,988	74	>75% Grass cover, Good, HSG C
	41,034	80	Weighted Average
	29,988		73.08% Pervious Area
	11,046		26.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 4 &5 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.942 ac, 26.92% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.76 cfs @ 18.21 hrs, Volume= 0.404 af
Outflow = 0.76 cfs @ 18.22 hrs, Volume= 0.404 af, Atten= 0%, Lag= 0.6 min
Primary = 0.76 cfs @ 18.22 hrs, Volume= 0.404 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-125.00 hrs, dt= 0.01 hrs
Peak Elev= 340.08' @ 18.22 hrs Surf.Area= 1,380 sf Storage= 1,298 cf

Plug-Flow detention time= 46.2 min calculated for 0.404 af (100% of inflow)
Center-of-Mass det. time= 46.0 min (1,019.7 - 973.7)

Volume	Invert	Avail.Storage	Storage Description
#1	336.67'	2,580 cf	**DMA 4 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.67'	3,333 cf	**DMA 5 Bio-swale (Prismatic)** Listed below (Recalc)
		5,913 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.67	600	0.0	0	0
336.68	600	40.0	2	2
338.67	600	40.0	478	480
338.68	600	10.0	1	481
340.67	600	10.0	119	600
340.68	600	100.0	6	606
341.17	1,071	100.0	409	1,015
341.67	1,560	100.0	658	1,673
342.17	2,067	100.0	907	2,580

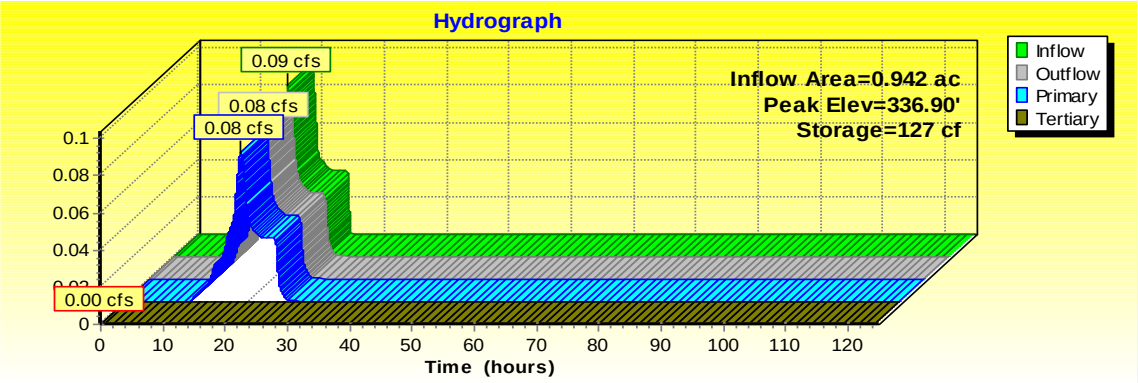
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.67	780	0.0	0	0
336.68	780	40.0	3	3
338.67	780	40.0	621	624
338.68	780	10.0	1	625
340.67	780	10.0	155	780
340.68	780	100.0	8	788
341.17	1,386	100.0	531	1,318
341.67	2,010	100.0	849	2,167
342.17	2,652	100.0	1,166	3,333

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.17'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.17'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.67'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.87'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.76 cfs @ 18.22 hrs HW=340.08' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.38 cfs @ 8.78 fps)
- **3=Orifice** (Orifice Controls 0.25 cfs @ 5.01 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.13 cfs @ 0.82 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.67' (Free Discharge)

DMA 4 & 5 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

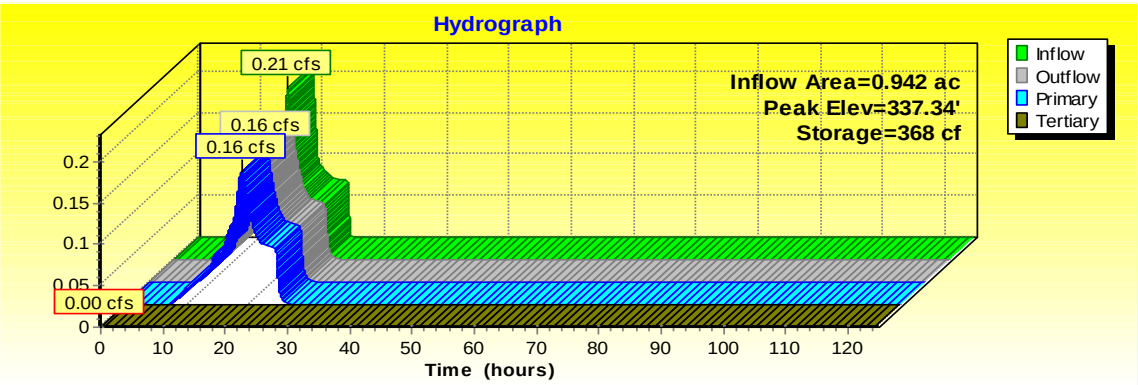
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

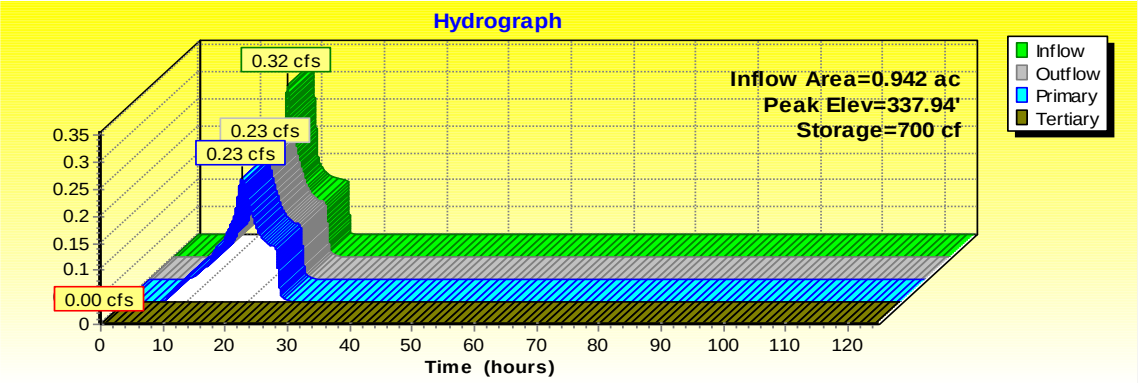
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

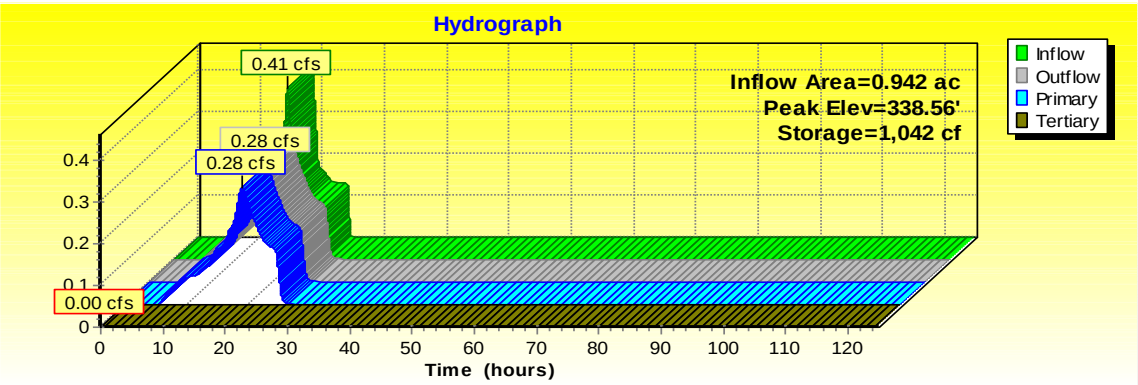
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

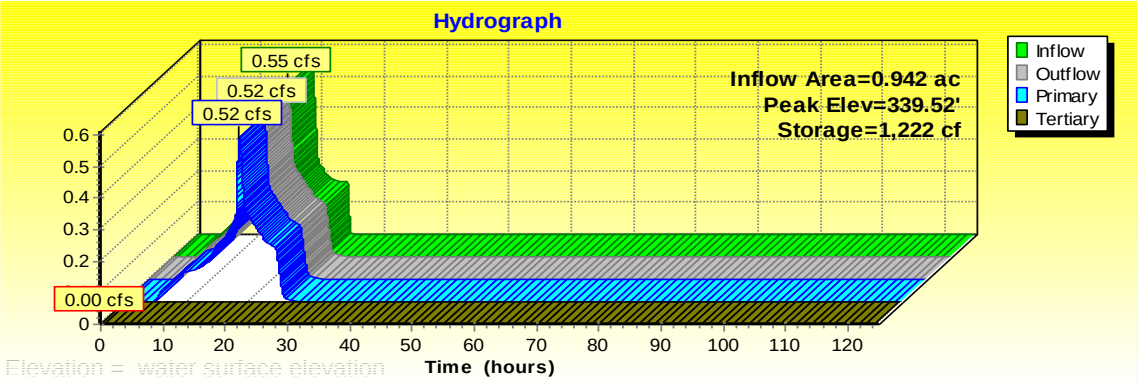
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 25-year Event



Inflow = all inflow into the storm water control

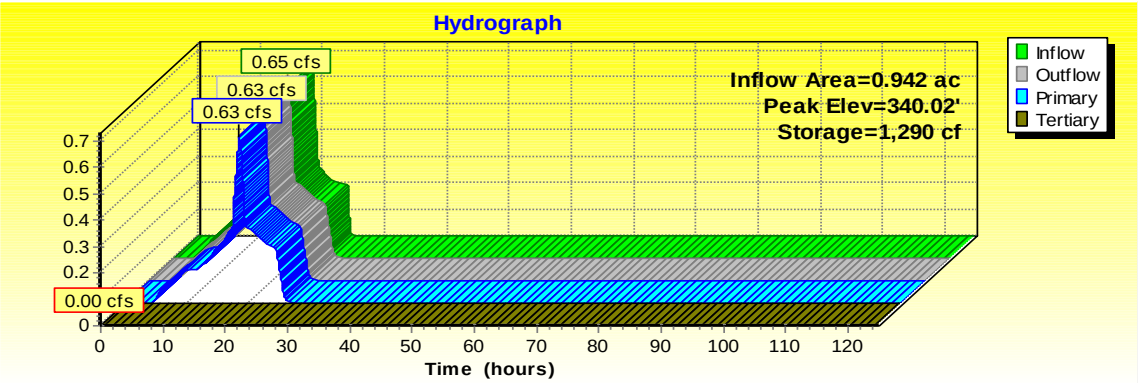
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

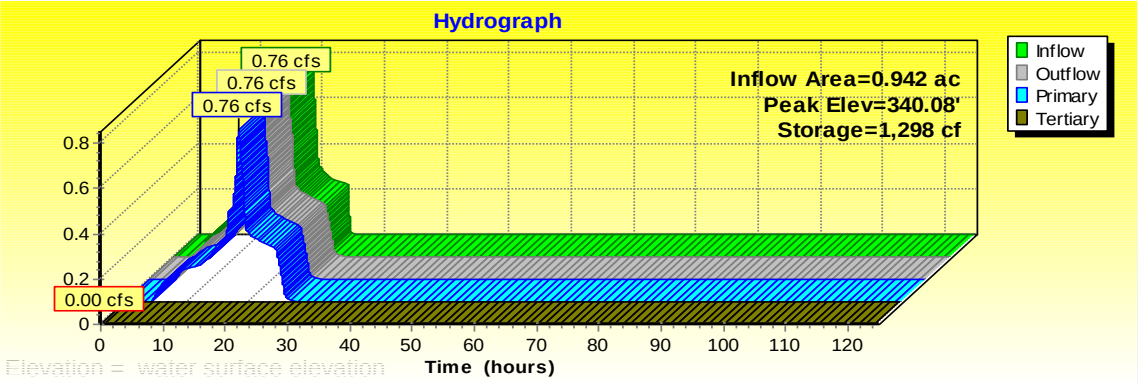
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 4 & 5 100-year Event



Inflow = all inflow into the storm water control

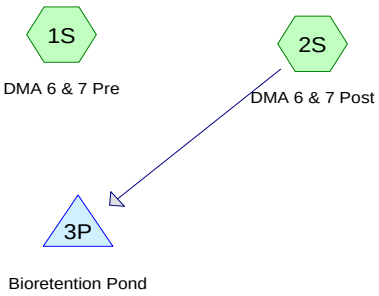
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via overflow bio-pond inlet

Tertiary = Occurs when water surface elevation exceeds top of bank

DMA 6 & 7 Event Summary



Events for Subcatchment 1S: DMA 6 & 7 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.47
2 year	2.90	0.20	0.089	1.18
5 year	3.84	0.30	0.144	1.91
10 year	4.62	0.39	0.193	2.56
25 year	5.72	0.52	0.266	3.53
50 year	6.59	0.61	0.326	4.32
100 year	**7.49**	**0.72**	**0.388**	**5.15**

Events for Subcatchment 2S: DMA 6 & 7 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.47
2 year	2.90	0.20	0.089	1.18
5 year	3.84	0.30	0.144	1.91
10 year	4.62	0.39	0.193	2.56
25 year	5.72	0.52	0.266	3.53
50 year	6.59	0.61	0.326	4.32
100 year	**7.49**	**0.72**	**0.388**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	336.25	78
2 year	0.20	0.19	0.19	0.00	336.38	144
5 year	0.30	0.28	0.28	0.00	336.57	241
10 year	0.39	0.35	0.35	0.00	336.78	347
25 year	0.52	0.49	0.49	0.00	337.01	467
50 year	0.61	0.58	0.58	0.00	337.18	551
100 year	**0.72**	**0.67**	**0.67**	0.00	**337.38**	**653**

DMA 6 & 7 Pre-Development

Summary for Subcatchment 1S: DMA 6 & 7 Pre

Runoff = 0.72 cfs @ 18.27 hrs, Volume= 0.388 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
39,422	80	>75% Grass cover, Good, HSG D
39,422		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 6 & 7 Post-Development

Summary for Subcatchment 2S: DMA 6 & 7 Post

Runoff = 0.72 cfs @ 18.27 hrs, Volume= 0.388 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	10,453	98	Roofs
*	28,969	74	>75% Grass cover, Good, HSG C
	39,422	80	Weighted Average
	28,969		73.48% Pervious Area
	10,453		26.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 6 & 7 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.905 ac, 26.52% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.72 cfs @ 18.27 hrs, Volume= 0.388 af
Outflow = 0.67 cfs @ 18.50 hrs, Volume= 0.388 af, Atten= 7%, Lag= 13.7 min
Primary = 0.67 cfs @ 18.50 hrs, Volume= 0.388 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 337.38' @ 18.50 hrs Surf.Area= 1,280 sf Storage= 653 cf

Plug-Flow detention time= 16.8 min calculated for 0.388 af (100% of inflow)
Center-of-Mass det. time= 14.8 min (993.1 - 978.3)

Volume	Invert	Avail.Storage	Storage Description
#1	336.10'	3,066 cf	**DMA 6 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.10'	2,741 cf	**DMA 7 Bio-swale (Prismatic)** Listed below (Recalc)
		5,807 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.10	640	0.0	0	0
336.11	640	40.0	3	3
338.10	640	40.0	509	512
338.11	640	40.0	3	515
340.10	640	10.0	127	642
340.11	640	10.0	1	643
340.60	640	100.0	314	956
341.10	1,141	100.0	445	1,401
341.60	1,660	100.0	700	2,102
342.10	2,197	100.0	964	3,066

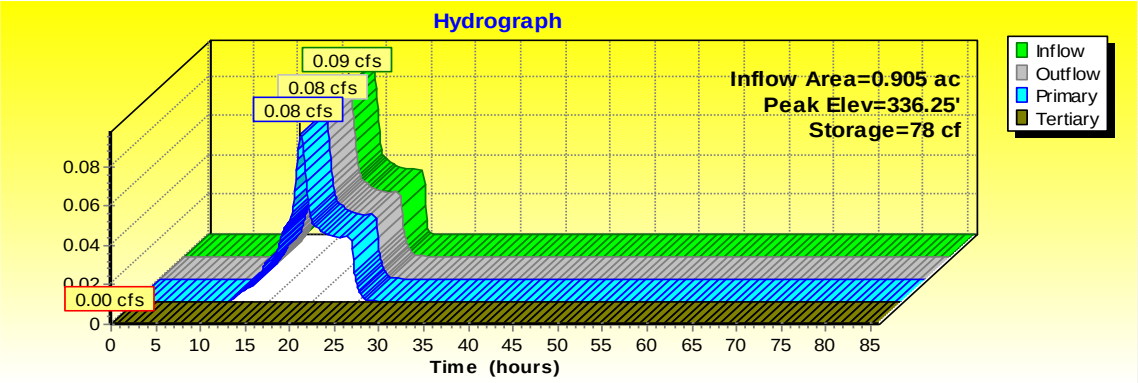
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.10	640	0.0	0	0
336.11	640	40.0	3	3
338.10	640	40.0	509	512
338.11	640	10.0	1	513
340.10	640	10.0	127	640
340.11	640	10.0	1	641
340.60	1,141	100.0	436	1,077
341.10	1,660	100.0	700	1,777
341.60	2,197	100.0	964	2,741

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.10'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.60'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.10'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	336.80'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.67 cfs @ 18.50 hrs HW=337.38' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.51 cfs @ 5.16 fps)
- **3=Orifice** (Orifice Controls 0.16 cfs @ 3.23 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.10' (Free Discharge)

DMA 6 & 7 95th% Event



Note: 0cfs discharge for 95th% event

Elevation = water surface elevation

Inflow = all inflow into the storm water control

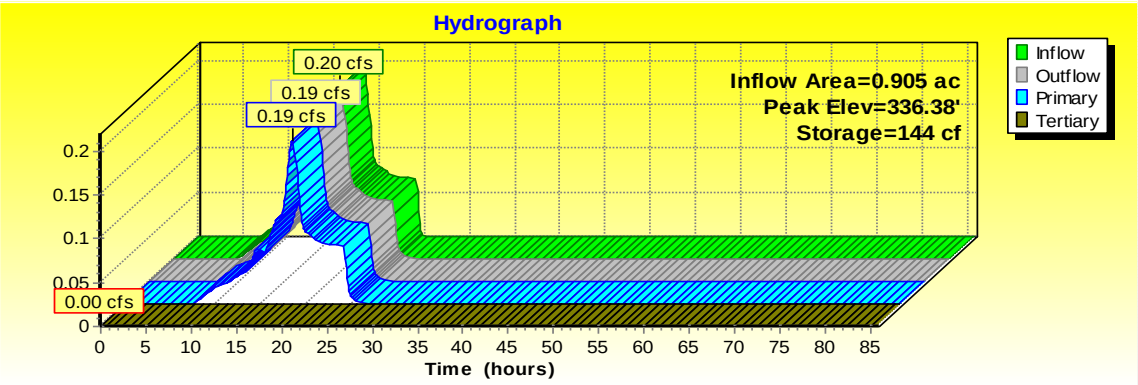
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet (no out flow runoff occurs only infiltrate into the ground)

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

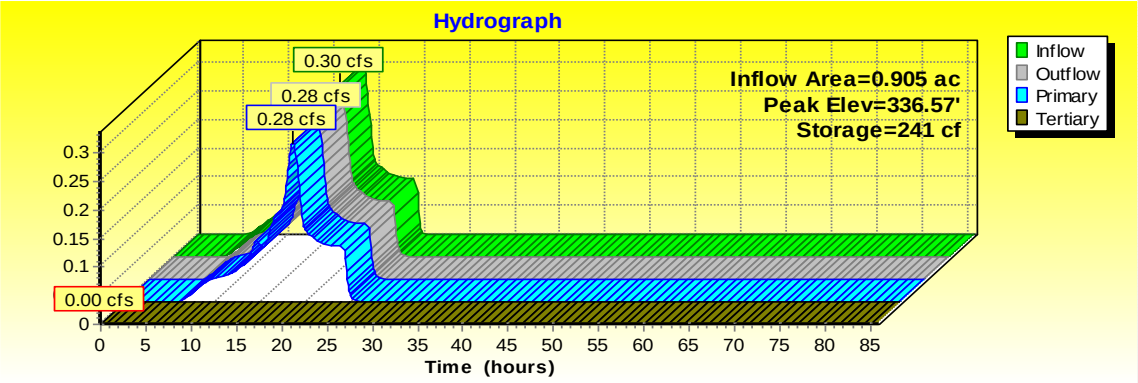
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet (flow runoff but infiltrate into the ground)

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

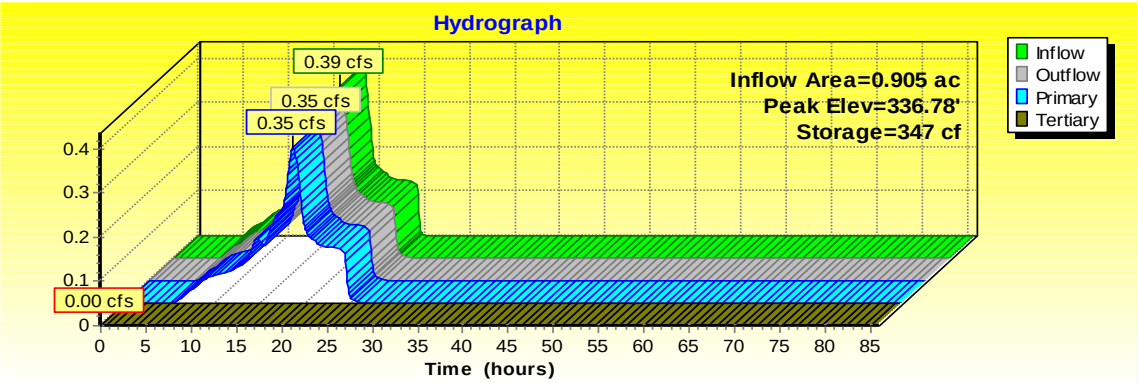
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary =flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

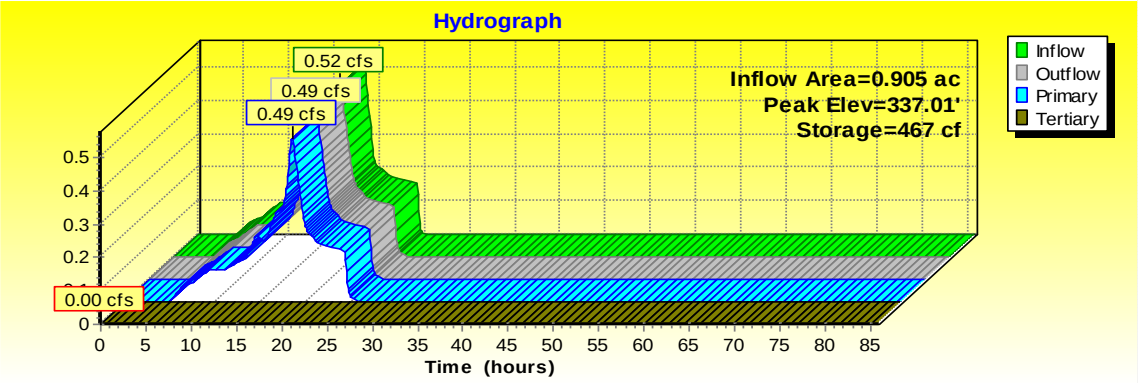
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

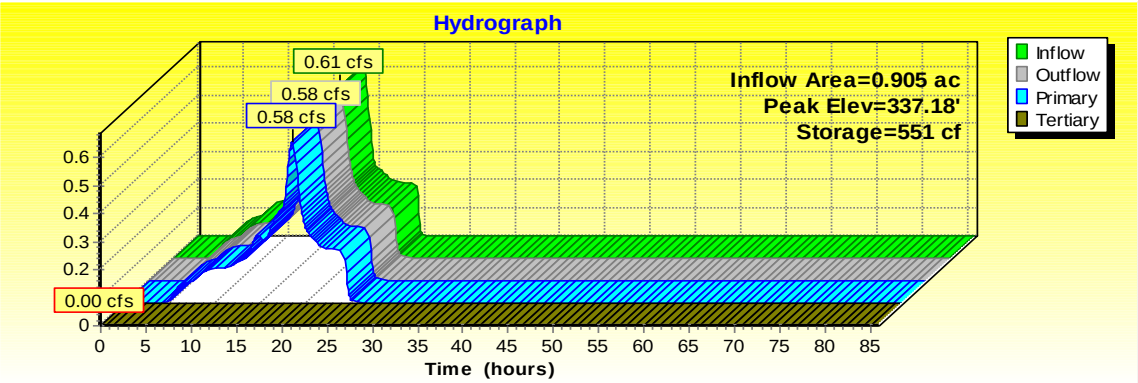
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

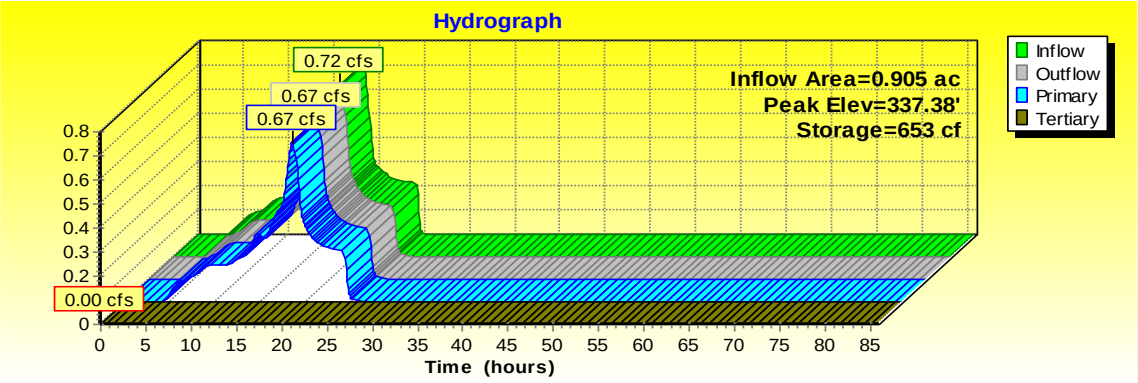
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 6 & 7 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

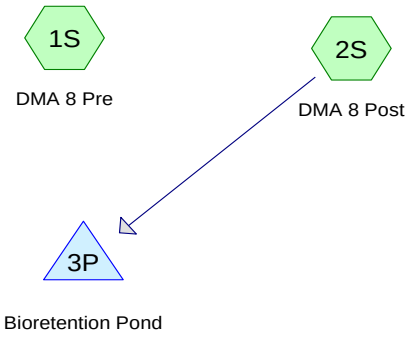
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 Event Summary



Events for Subcatchment 1S: DMA 8 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.036	0.44
2 year	2.90	0.21	0.093	1.12
5 year	3.84	0.32	0.153	1.83
10 year	4.62	0.42	0.206	2.48
25 year	5.72	0.56	0.286	3.43
50 year	6.59	0.67	0.351	4.21
100 year	**7.49**	**0.78**	**0.419**	**5.03**

Events for Subcatchment 2S: DMA 8 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.13	0.057	0.69
2 year	2.90	0.26	0.125	1.50
5 year	3.84	0.38	0.193	2.32
10 year	4.62	0.47	0.251	3.02
25 year	5.72	0.61	0.336	4.04
50 year	6.59	0.72	0.405	4.86
100 year	**7.49**	**0.83**	**0.476**	**5.72**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.13	0.07	0.07	**0.00**	336.69	524
2 year	0.26	0.21	0.21	0.00	337.37	1,125
5 year	0.38	0.30	0.30	0.00	337.72	1,434
10 year	0.47	0.36	0.36	0.00	338.05	1,723
25 year	0.61	0.52	0.52	0.00	339.25	2,030
50 year	0.72	0.61	0.61	0.00	340.12	2,247
100 year	**0.83**	**0.69**	**0.69**	0.00	**340.25**	**2,528**

DMA 8 Pre-Development

Summary for Subcatchment 1S: DMA 8 Pre

Runoff = 0.78 cfs @ 18.27 hrs, Volume= 0.419 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
43,516	79	50-75% Grass cover, Fair, HSG C
43,516		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 8 Post-Development

Summary for Subcatchment 2S: DMA 8 Post

Runoff = 0.83 cfs @ 18.27 hrs, Volume= 0.476 af, Depth= 5.72"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	20,566	98	Roofs
*	22,950	74	>75% Grass cover, Good, HSG C
	43,516	85	Weighted Average
	22,950		52.74% Pervious Area
	20,566		47.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 8 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.999 ac, 47.26% Impervious, Inflow Depth = 5.72" for 100 year event
Inflow = 0.83 cfs @ 18.27 hrs, Volume= 0.476 af
Outflow = 0.69 cfs @ 18.67 hrs, Volume= 0.476 af, Atten= 17%, Lag= 24.0 min
Primary = 0.69 cfs @ 18.67 hrs, Volume= 0.476 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.25' @ 18.67 hrs Surf.Area= 2,210 sf Storage= 2,528 cf

Plug-Flow detention time= 84.0 min calculated for 0.476 af (100% of inflow)
Center-of-Mass det. time= 82.7 min (1,034.1 - 951.5)

Volume	Invert	Avail.Storage	Storage Description
#1	336.10'	8,472 cf	**DMA 8 Bio-swale (Prismatic)** Listed below (Recalc)

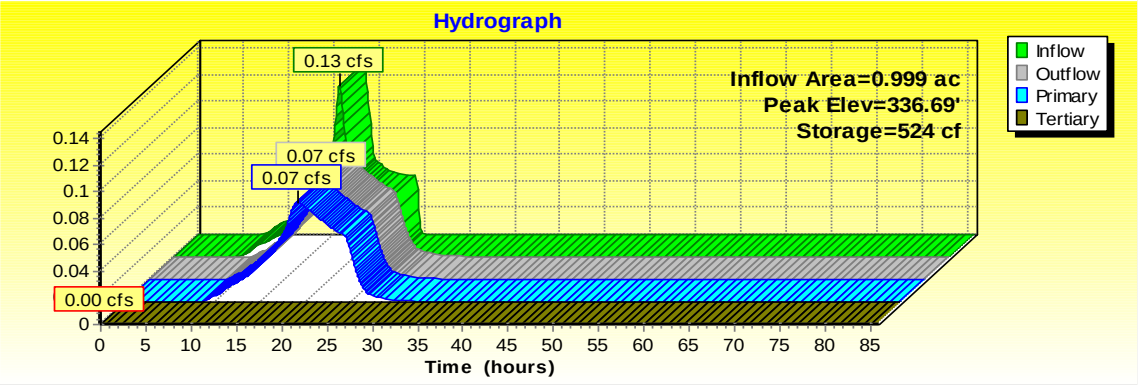
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.10	2,210	0.0	0	0
336.11	2,210	40.0	9	9
338.10	2,210	40.0	1,759	1,768
338.11	2,210	40.0	9	1,777
340.10	2,210	10.0	440	2,217
340.11	2,210	10.0	2	2,219
340.60	2,210	100.0	1,083	3,302
341.10	3,025	100.0	1,309	4,610
341.60	3,857	100.0	1,721	6,331
342.10	4,707	100.0	2,141	8,472

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.10'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.60'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.10'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	336.10'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.20'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.69 cfs @ 18.67 hrs HW=340.25' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.41 cfs @ 8.37 fps)
- **3=Orifice** (Orifice Controls 0.21 cfs @ 9.71 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.65 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.10' (Free Discharge)

DMA 8 95th% Event



Note: 0cfs discharge for 95th% event

Elevation = water surface elevation

Inflow = all inflow into the storm water control

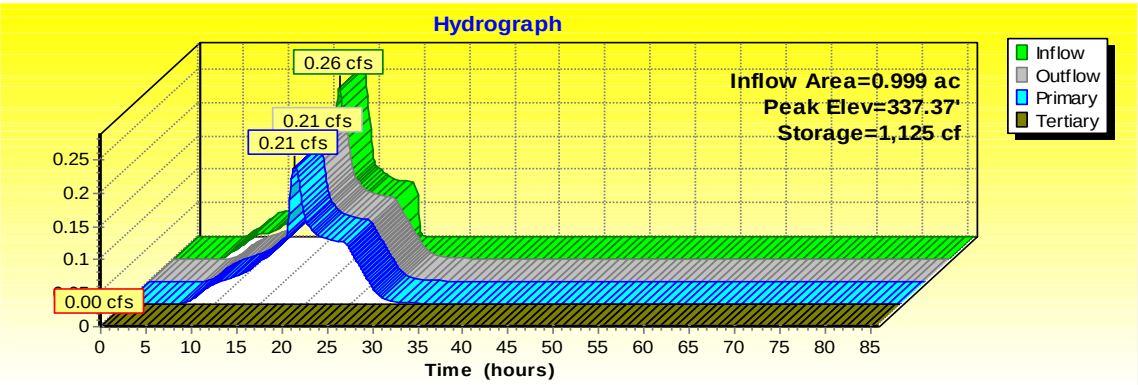
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

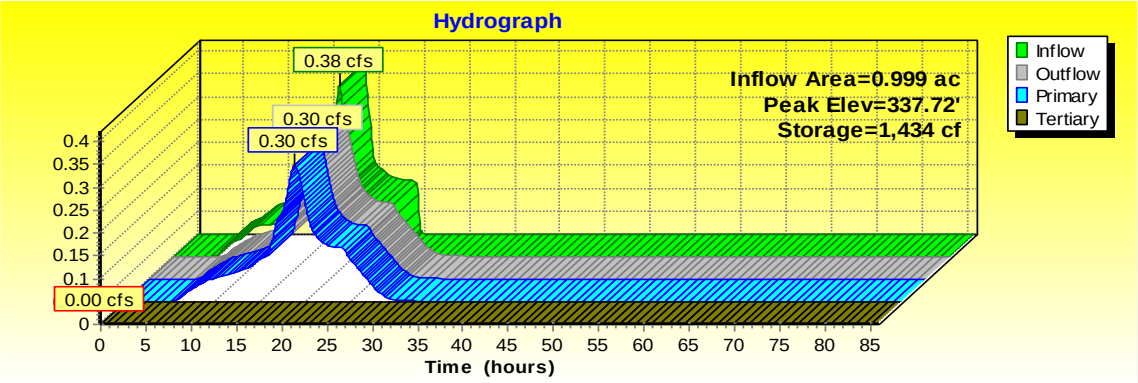
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

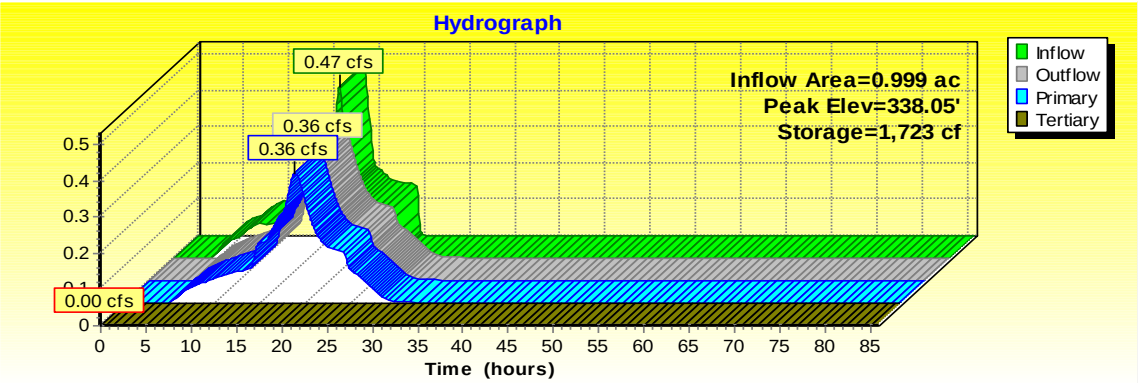
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

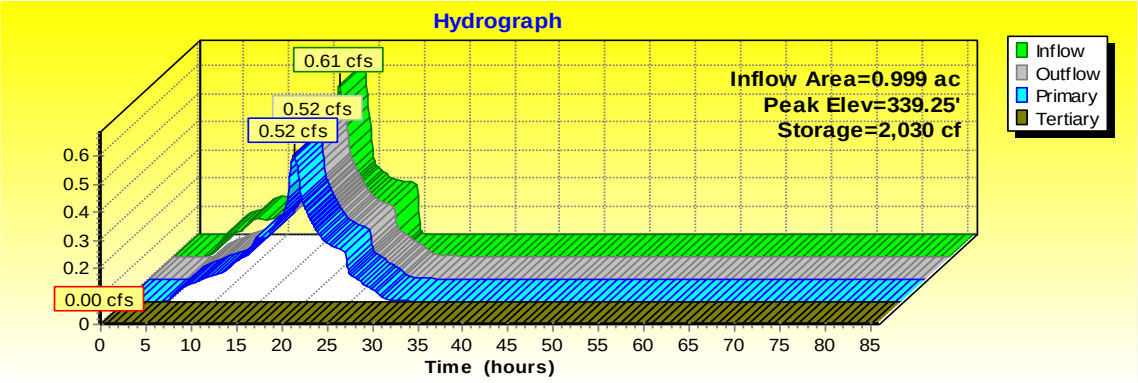
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

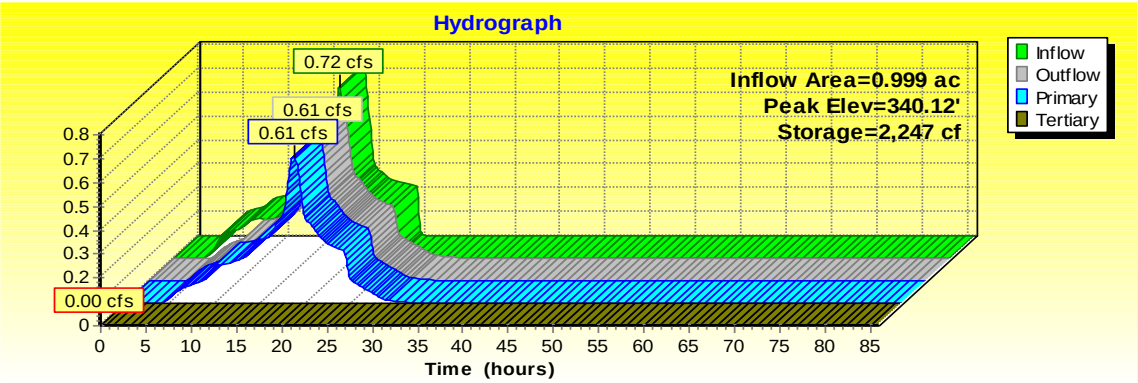
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

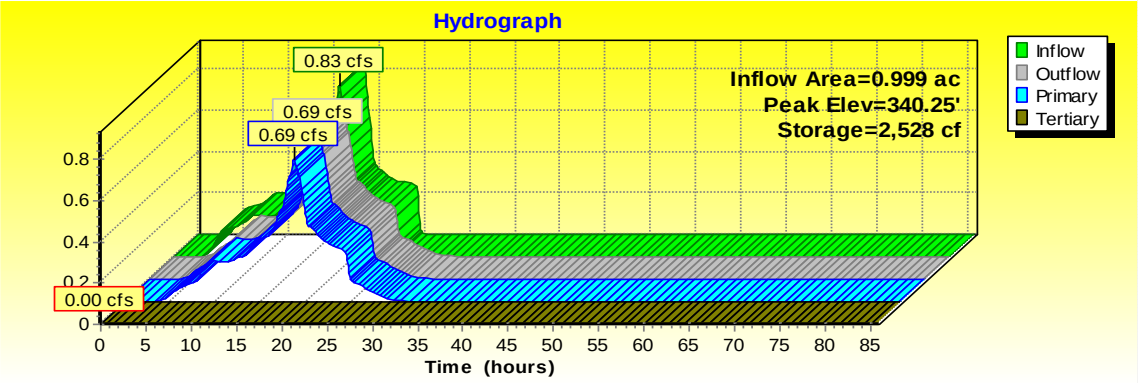
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 8 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

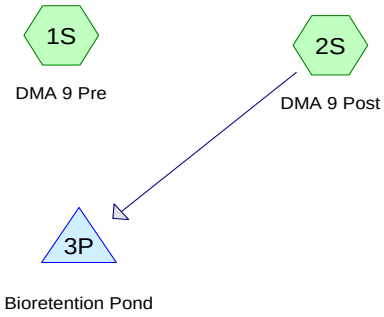
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 Event Summary



Events for Subcatchment 1S: DMA 9 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.08	0.033	0.44
2 year	2.90	0.19	0.083	1.12
5 year	3.84	0.29	0.137	1.83
10 year	4.62	0.38	0.185	2.48
25 year	5.72	0.50	0.256	3.43
50 year	6.59	0.60	0.314	4.21
100 year	**7.49**	**0.70**	**0.376**	**5.03**

Events for Subcatchment 2S: DMA 9 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.035	0.47
2 year	2.90	0.19	0.088	1.18
5 year	3.84	0.30	0.143	1.91
10 year	4.62	0.39	0.191	2.56
25 year	5.72	0.51	0.264	3.53
50 year	6.59	0.61	0.322	4.32
100 year	**7.49**	**0.71**	**0.384**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	337.49	113
2 year	0.19	0.16	0.16	0.00	337.85	285
5 year	0.30	0.28	0.28	0.00	338.18	442
10 year	0.39	0.37	0.37	0.00	338.29	495
25 year	0.51	0.48	0.48	0.00	338.48	585
50 year	0.61	0.57	0.57	0.00	338.67	677
100 year	**0.71**	**0.65**	**0.65**	0.00	**338.90**	**787**

DMA 9 Pre-Development

Summary for Subcatchment 1S: DMA 9 Pre

Runoff = 0.70 cfs @ 18.27 hrs, Volume= 0.376 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
39,030	79	50-75% Grass cover, Fair, HSG C
39,030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 9 Post-Development

Summary for Subcatchment 2S: DMA 9 Post

Runoff = 0.71 cfs @ 18.27 hrs, Volume= 0.384 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,734	98	Roofs
*	29,296	74	>75% Grass cover, Good, HSG C
	39,030	80	Weighted Average
	29,296		75.06% Pervious Area
	9,734		24.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 9 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.896 ac, 24.94% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.71 cfs @ 18.27 hrs, Volume= 0.384 af
Outflow = 0.65 cfs @ 18.52 hrs, Volume= 0.384 af, Atten= 8%, Lag= 14.7 min
Primary = 0.65 cfs @ 18.52 hrs, Volume= 0.384 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 338.90' @ 18.52 hrs Surf.Area= 1,190 sf Storage= 787 cf

Plug-Flow detention time= 25.4 min calculated for 0.384 af (100% of inflow)
Center-of-Mass det. time= 25.6 min (1,003.9 - 978.3)

Volume	Invert	Avail.Storage	Storage Description
#1	337.25'	4,010 cf	**DMA 9 Bioswale (Prismatic)** Listed below (Recalc)

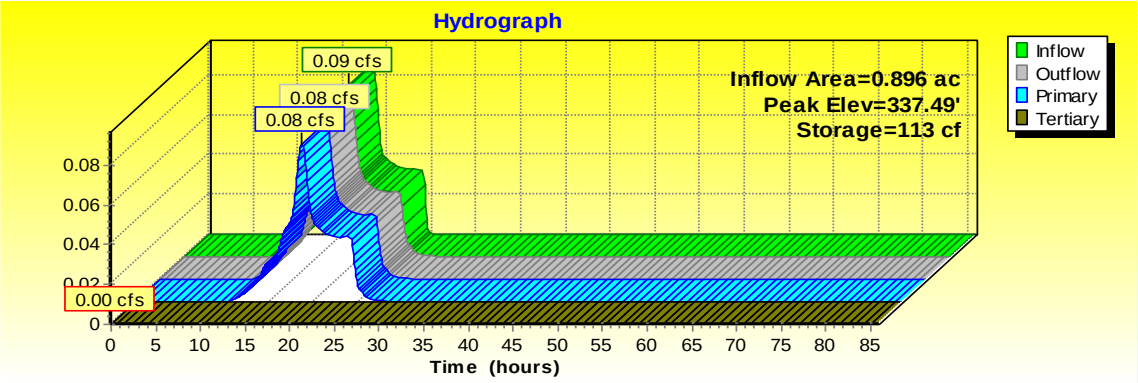
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.25	1,190	0.0	0	0
337.26	1,190	40.0	5	5
339.25	1,190	40.0	947	952
339.26	1,190	40.0	5	957
341.25	1,190	10.0	237	1,194
341.26	1,190	10.0	1	1,195
341.75	1,644	100.0	694	1,889
342.25	2,117	100.0	940	2,829
342.75	2,607	100.0	1,181	4,010

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.75'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.75'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.25'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.00'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.65 cfs @ 18.52 hrs HW=338.90' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.29 cfs @ 5.95 fps)
- **3=Orifice** (Orifice Controls 0.36 cfs @ 4.13 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.25' (Free Discharge)

DMA 9 95th% Event



Note: 0cfs discharge for 95th% event

Elevation = water surface elevation

Inflow = all inflow into the storm water control

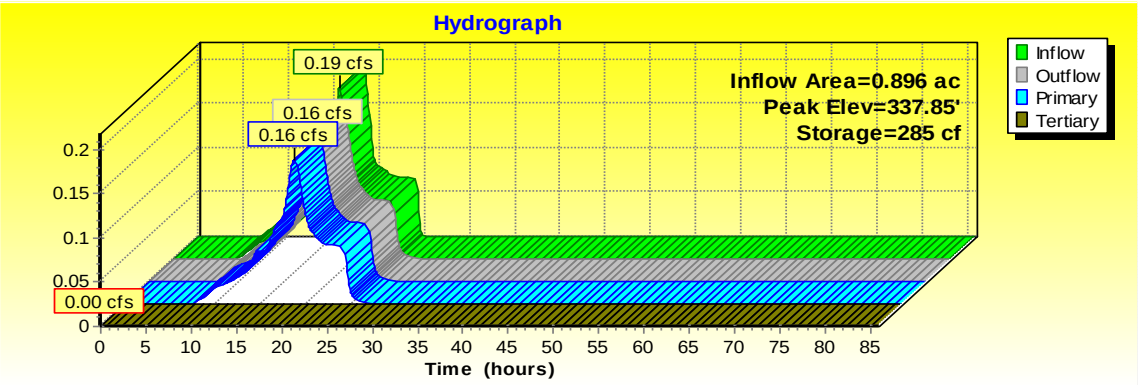
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

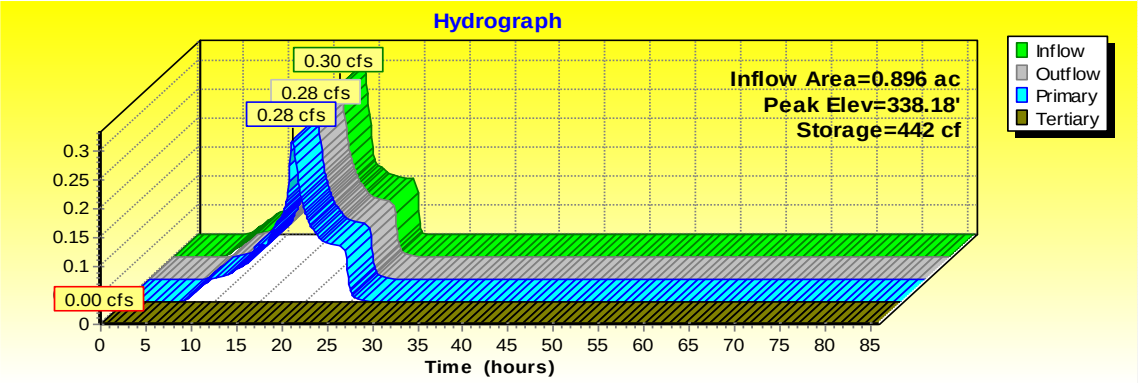
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

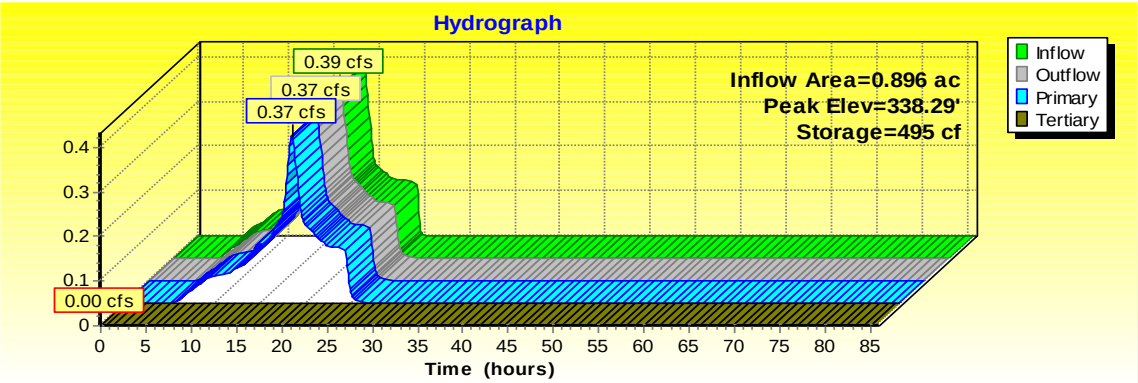
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

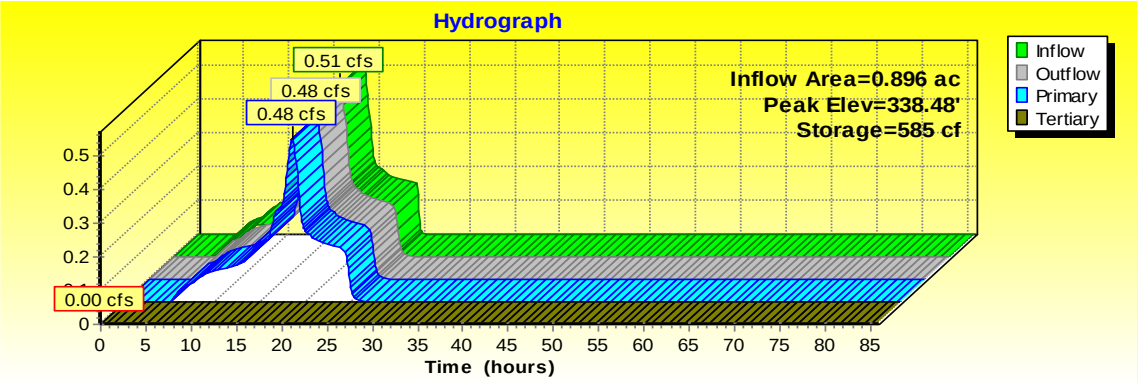
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

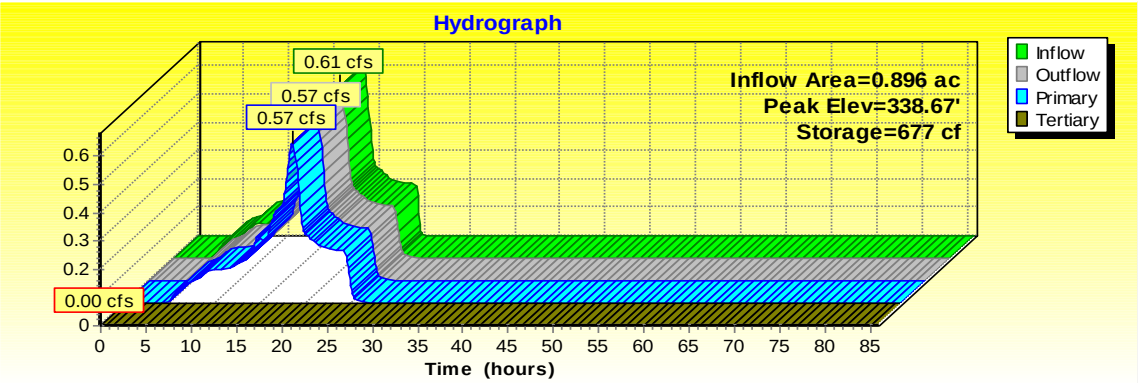
Discarded = flow out via infiltration

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

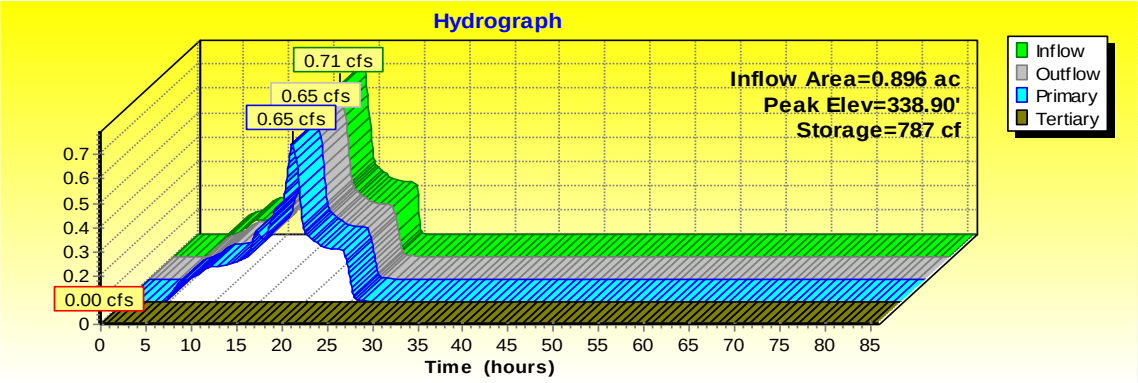
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 9 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

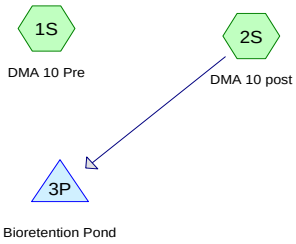
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 Event Summary



Events for Subcatchment 1S: DMA 10 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.015	0.44
2 year	2.90	0.08	0.037	1.12
5 year	3.84	0.13	0.061	1.83
10 year	4.62	0.17	0.083	2.48
25 year	5.72	0.22	0.115	3.43
50 year	6.59	0.27	0.141	4.21
100 year	**7.49**	**0.31**	**0.168**	**5.03**

Events for Subcatchment 2S: DMA 10 post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.06	0.026	0.79
2 year	2.90	0.11	0.055	1.65
5 year	3.84	0.16	0.083	2.49
10 year	4.62	0.20	0.107	3.21
25 year	5.72	0.25	0.142	4.25
50 year	6.59	0.30	0.170	5.08
100 year	**7.49**	**0.34**	**0.199**	**5.95**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.06	0.04	0.04	**0.00**	336.69	134
2 year	0.11	0.07	0.07	0.00	337.21	348
5 year	0.16	0.09	0.09	0.00	337.84	602
10 year	0.20	0.15	0.15	0.00	338.19	747
25 year	0.25	0.22	0.22	0.00	338.89	873
50 year	0.30	0.27	0.27	0.00	339.48	934
100 year	**0.34**	**0.30**	**0.30**	0.00	**340.11**	**997**

DMA 10 Pre-Development

Summary for Subcatchment 1S: DMA 10 Pre

Runoff = 0.31 cfs @ 18.27 hrs, Volume= 0.168 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
17,468	79	50-75% Grass cover, Fair, HSG C
17,468		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 10 Post-Development

Summary for Subcatchment 2S: DMA 10 post

Runoff = 0.34 cfs @ 18.27 hrs, Volume= 0.199 af, Depth= 5.95"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,102	98	Roofs
*	8,366	74	>75% Grass cover, Good, HSG C
	17,468	87	Weighted Average
	8,366		47.89% Pervious Area
	9,102		52.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.401 ac, 52.11% Impervious, Inflow Depth = 5.95" for 100 year event
Inflow = 0.34 cfs @ 18.27 hrs, Volume= 0.199 af
Outflow = 0.30 cfs @ 18.55 hrs, Volume= 0.199 af, Atten= 11%, Lag= 17.2 min
Primary = 0.30 cfs @ 18.55 hrs, Volume= 0.199 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.11' @ 18.55 hrs Surf.Area= 1,020 sf Storage= 997 cf

Plug-Flow detention time= 79.7 min calculated for 0.199 af (100% of inflow)
Center-of-Mass det. time= 80.0 min (1,020.0 - 940.0)

Volume	Invert	Avail.Storage	Storage Description
#1	336.36'	4,692 cf	**DMA 10 Bio-swale (Prismatic)** Listed below (Recalc)

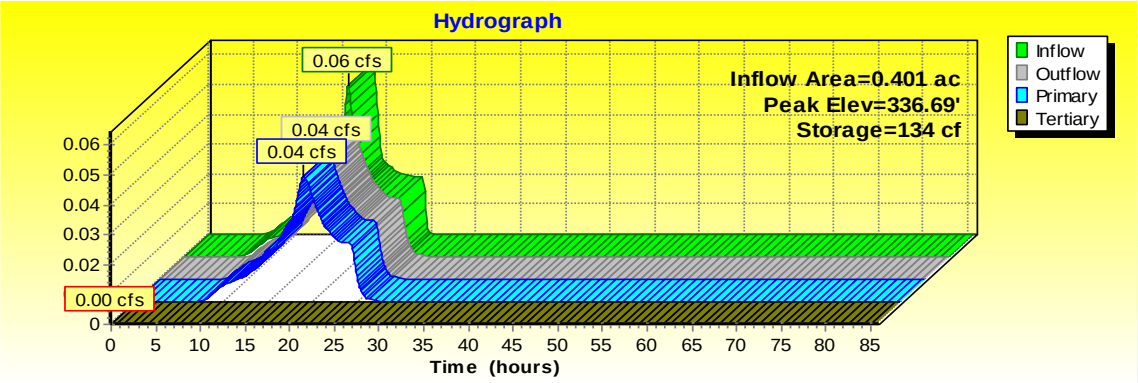
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.36	1,020	0.0	0	0
336.37	1,020	40.0	4	4
338.36	1,020	40.0	812	816
338.37	1,020	40.0	4	820
340.36	1,020	10.0	203	1,023
340.37	1,020	10.0	1	1,024
340.86	1,414	100.0	596	1,620
341.36	1,827	100.0	810	2,431
341.86	2,257	100.0	1,021	3,452
342.36	2,706	100.0	1,241	4,692

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.36'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.86'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.36'	**1.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.90'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.20'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.30 cfs @ 18.55 hrs HW=340.10' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.15 cfs @ 9.26 fps)
- **3=Orifice** (Orifice Controls 0.15 cfs @ 7.00 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.36' (Free Discharge)

DMA 10 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

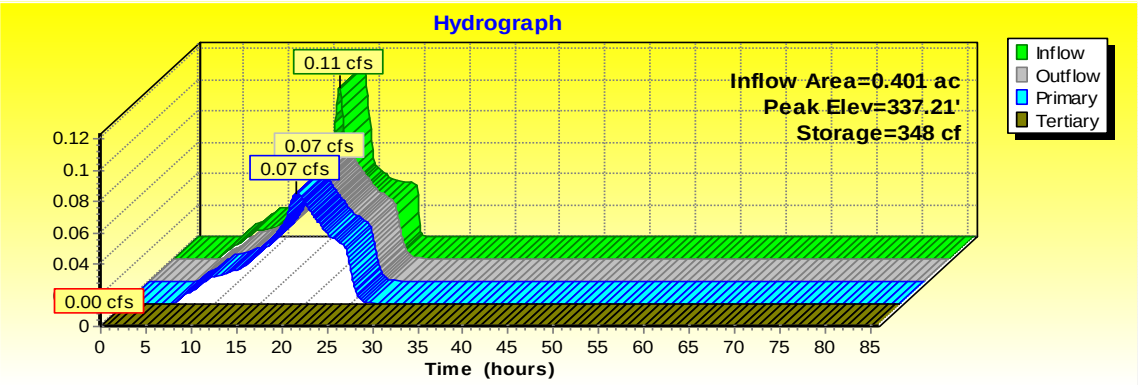
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

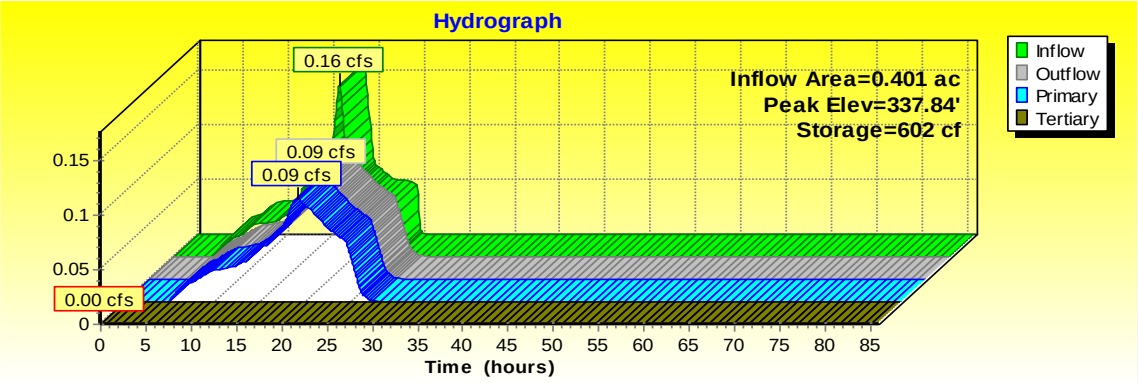
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

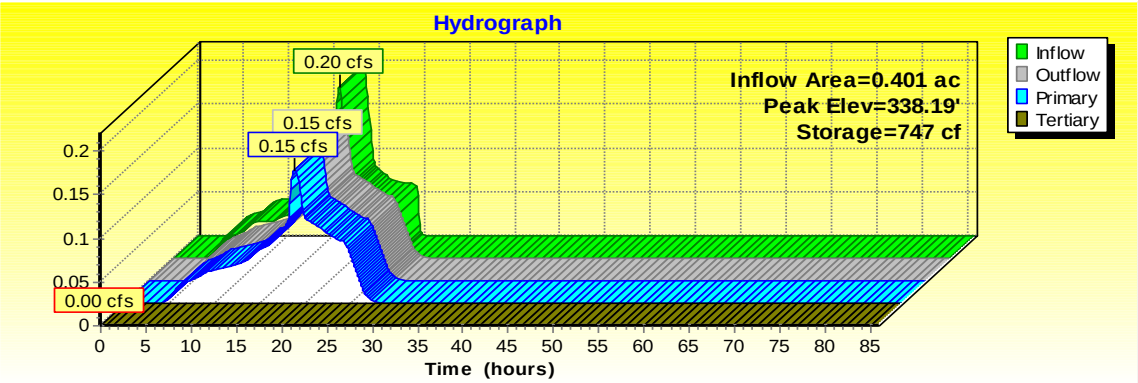
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

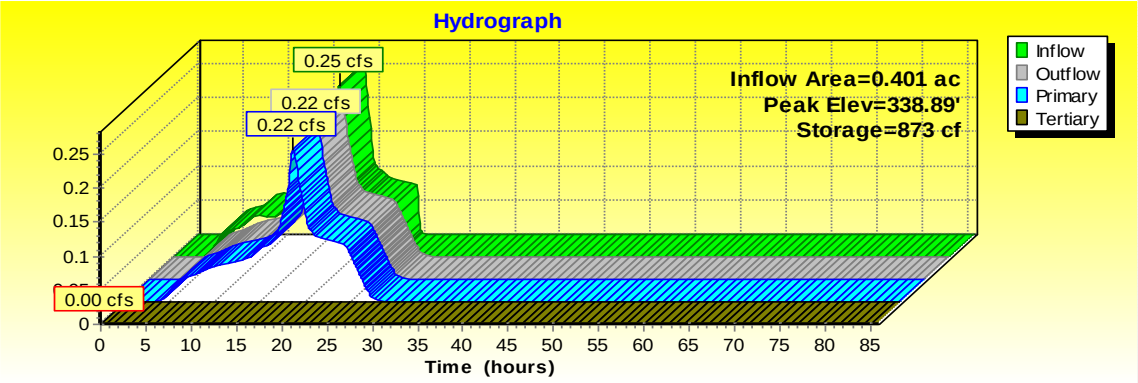
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

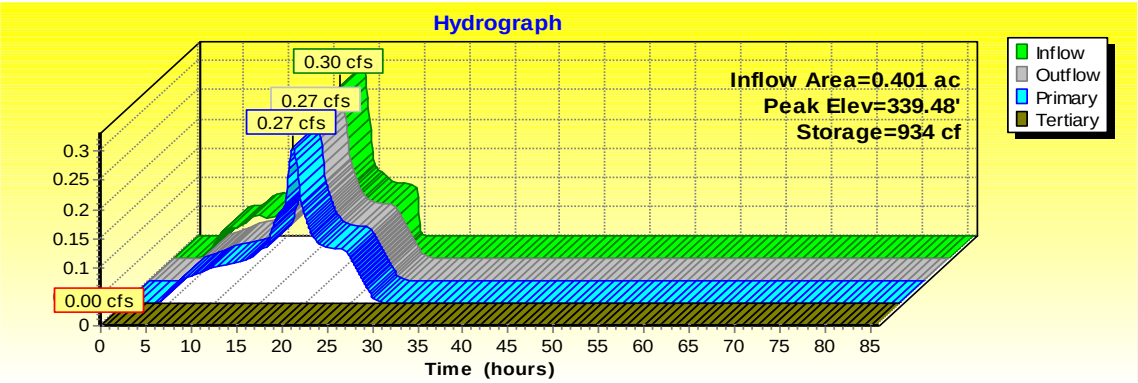
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

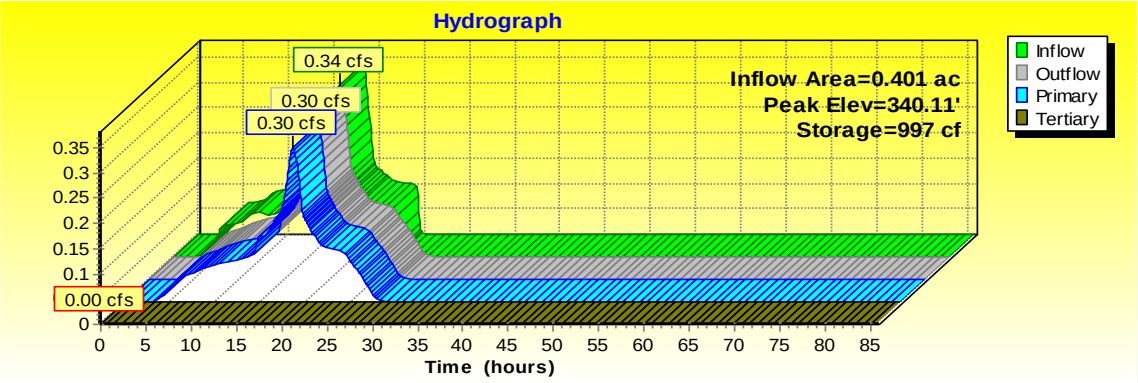
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 10 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

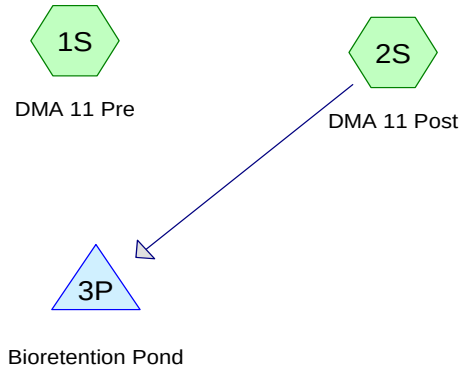
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 Event Summary



Events for Subcatchment 1S: DMA 11 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.016	0.47
2 year	2.90	0.09	0.039	1.18
5 year	3.84	0.13	0.063	1.91
10 year	4.62	0.17	0.084	2.56
25 year	5.72	0.22	0.116	3.53
50 year	6.59	0.27	0.142	4.32
100 year	**7.49**	**0.31**	**0.169**	**5.15**

Events for Subcatchment 2S: DMA 11 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.06	0.028	0.85
2 year	2.90	0.11	0.057	1.73
5 year	3.84	0.16	0.085	2.58
10 year	4.62	0.20	0.109	3.31
25 year	5.72	0.25	0.143	4.36
50 year	6.59	0.29	0.171	5.20
100 year	**7.49**	**0.34**	**0.200**	**6.07**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.06	0.04	0.04	**0.00**	337.70	217
2 year	0.11	0.06	0.06	0.00	338.47	542
5 year	0.16	0.08	0.08	0.00	339.73	901
10 year	0.20	0.18	0.18	0.00	340.69	1,001
25 year	0.26	0.23	0.23	0.00	341.21	1,077
50 year	0.30	0.28	0.28	0.00	341.25	1,114
100 year	**0.35**	**0.33**	**0.33**	0.00	**341.27**	**1,144**

DMA 11 Pre-Development

Summary for Subcatchment 1S: DMA 11 Pre

Runoff = 0.31 cfs @ 18.27 hrs, Volume= 0.169 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
17,206	80	>75% Grass cover, Good, HSG D
17,206		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 11 Post-Development

Summary for Subcatchment 2S: DMA 11 Post

Runoff = 0.34 cfs @ 18.27 hrs, Volume= 0.200 af, Depth= 6.07"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	10,061	98	Roofs
*	7,145	74	>75% Grass cover, Good, HSG C
	17,206	88	Weighted Average
	7,145		41.53% Pervious Area
	10,061		58.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 11 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.395 ac, 58.47% Impervious, Inflow Depth = 6.07" for 100 year event
Inflow = 0.35 cfs @ 18.13 hrs, Volume= 0.200 af
Outflow = 0.33 cfs @ 18.26 hrs, Volume= 0.200 af, Atten= 4%, Lag= 7.9 min
Primary = 0.33 cfs @ 18.26 hrs, Volume= 0.200 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 341.27' @ 18.26 hrs Surf.Area= 1,158 sf Storage= 1,144 cf

Plug-Flow detention time= 121.3 min calculated for 0.200 af (100% of inflow)
Center-of-Mass det. time= 119.6 min (1,044.4 - 924.8)

Volume	Invert	Avail.Storage	Storage Description
#1	337.18'	5,819 cf	**DMA 11 Bio-swale (Prismatic)** Listed below (Recalc)

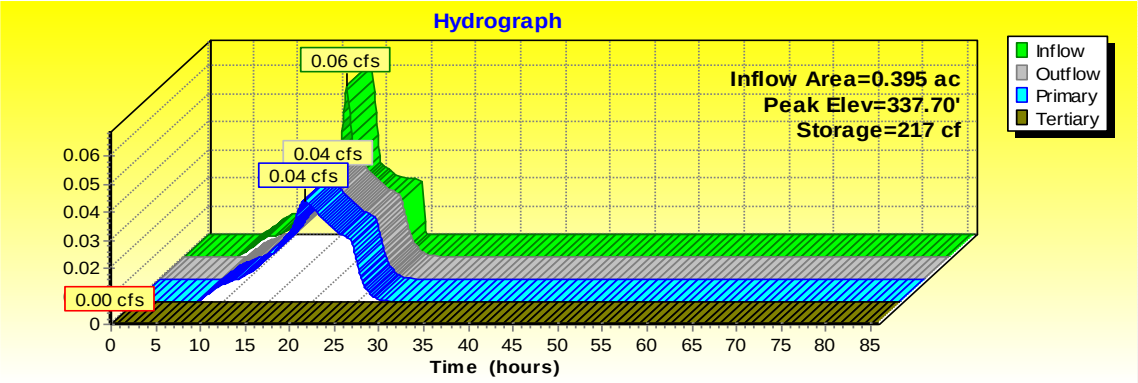
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.18	1,050	0.0	0	0
337.19	1,050	40.0	4	4
339.18	1,050	40.0	836	840
339.19	1,050	40.0	4	844
341.18	1,050	10.0	209	1,053
341.19	1,050	10.0	1	1,054
341.68	1,704	100.0	675	1,729
342.18	2,376	100.0	1,020	2,749
342.68	3,066	100.0	1,361	4,109
343.18	3,774	100.0	1,710	5,819

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.18'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.68'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.18'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	340.00'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	341.20'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.33 cfs @ 18.26 hrs HW=341.27' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.11 cfs @ 9.69 fps)
- **3=Orifice** (Orifice Controls 0.11 cfs @ 5.25 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.77 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.18' (Free Discharge)

DMA 11 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

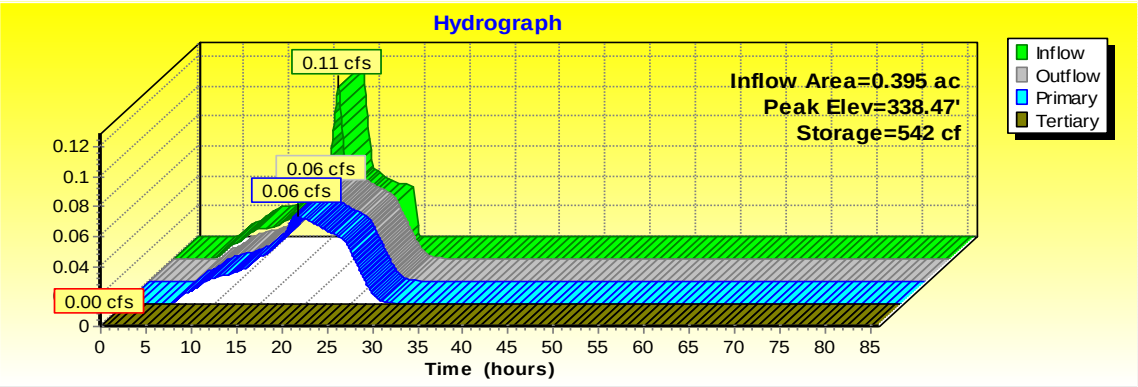
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

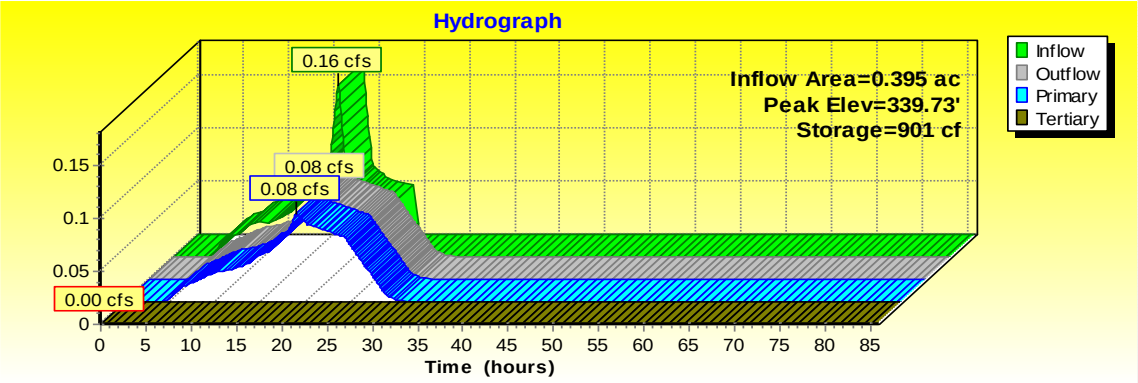
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

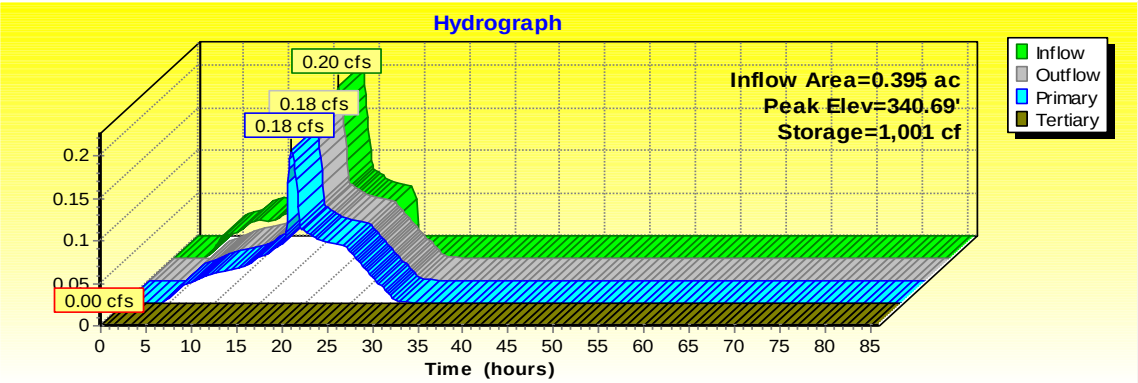
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

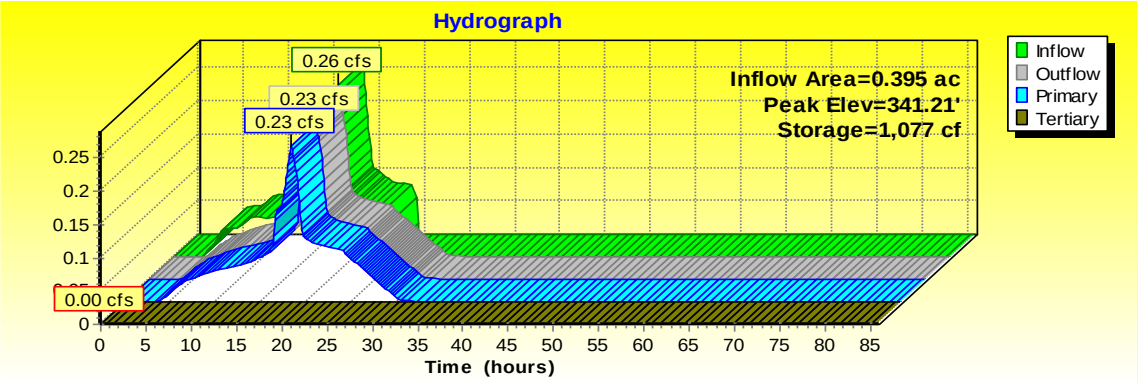
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

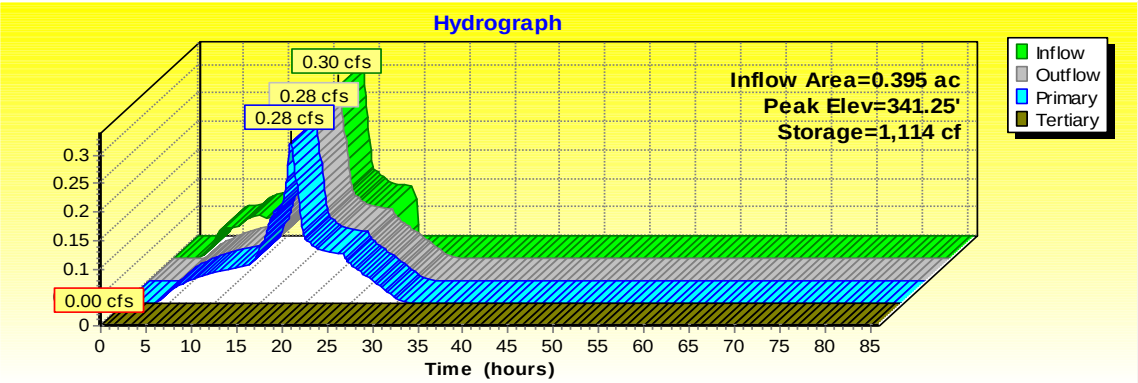
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

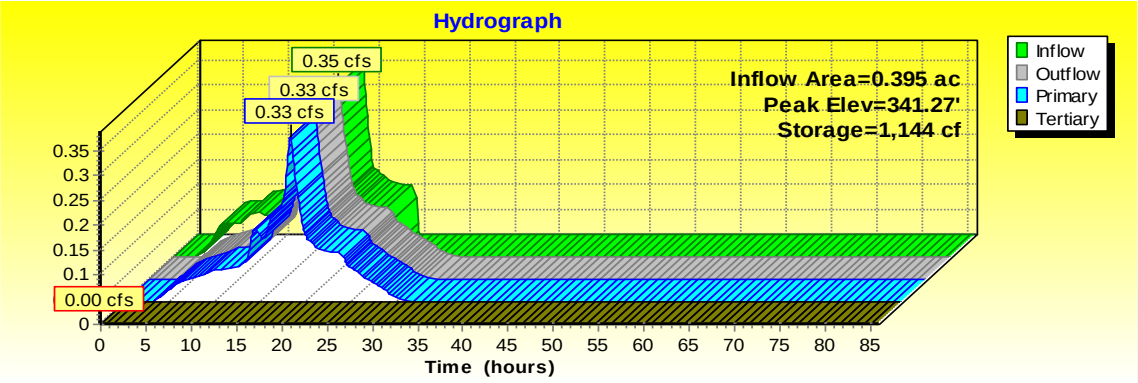
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 11 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

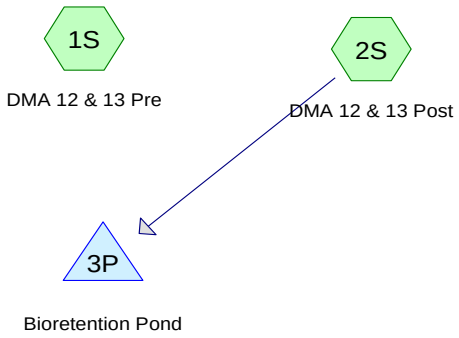
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 Event Summary



Events for Subcatchment 1S: DMA 12 & 13 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.05	0.020	0.47
2 year	2.90	0.11	0.050	1.18
5 year	3.84	0.17	0.081	1.91
10 year	4.62	0.23	0.108	2.56
25 year	5.72	0.30	0.149	3.53
50 year	6.59	0.36	0.182	4.32
100 year	**7.49**	**0.41**	**0.218**	**5.15**

Events for Subcatchment 2S: DMA 12 & 13 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.06	0.027	0.64
2 year	2.90	0.13	0.061	1.43
5 year	3.84	0.19	0.094	2.23
10 year	4.62	0.24	0.124	2.92
25 year	5.72	0.32	0.166	3.94
50 year	6.59	0.37	0.201	4.75
100 year	**7.49**	**0.43**	**0.237**	**5.61**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.06	0.05	0.05	**0.00**	337.67	134
2 year	0.13	0.09	0.09	0.00	338.15	348
5 year	0.19	0.18	0.18	0.00	338.42	467
10 year	0.24	0.22	0.22	0.00	338.55	522
25 year	0.32	0.28	0.28	0.00	338.76	618
50 year	0.37	0.32	0.32	0.00	338.97	709
100 year	**0.43**	**0.36**	**0.36**	0.00	**339.20**	**815**

DMA 12 & 13 Pre-Development

Summary for Subcatchment 1S: DMA 12 & 13 Pre

Runoff = 0.41 cfs @ 18.14 hrs, Volume= 0.218 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
22,085	80	>75% Grass cover, Good, HSG D
22,085		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 12 & 13 Post-Development

Summary for Subcatchment 2S: DMA 12 & 13 Post

Runoff = 0.43 cfs @ 18.13 hrs, Volume= 0.237 af, Depth= 5.61"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,492	98	Roofs
*	12,593	74	>75% Grass cover, Good, HSG C
	22,085	84	Weighted Average
	12,593		57.02% Pervious Area
	9,492		42.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 12 & 13 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.507 ac, 42.98% Impervious, Inflow Depth = 5.61" for 100 year event
Inflow = 0.43 cfs @ 18.13 hrs, Volume= 0.237 af
Outflow = 0.36 cfs @ 18.47 hrs, Volume= 0.237 af, Atten= 17%, Lag= 20.2 min
Primary = 0.36 cfs @ 18.47 hrs, Volume= 0.237 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
Peak Elev= 339.20' @ 18.47 hrs Surf.Area= 1,110 sf Storage= 815 cf

Plug-Flow detention time= 48.2 min calculated for 0.237 af (100% of inflow)
Center-of-Mass det. time= 48.5 min (996.3 - 947.8)

Volume	Invert	Avail.Storage	Storage Description
#1	337.37'	2,303 cf	**DMA 13 Bio-swale (Prismatic)** Listed below (Recalc)
#2	337.37'	4,203 cf	**DMA 12 Bio-swale (Prismatic)** Listed below (Recalc)
		6,506 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	360	0.0	0	0
337.38	360	40.0	1	1
339.37	360	40.0	287	288
339.38	360	40.0	1	289
341.37	360	10.0	72	361
341.38	360	10.0	0	361
341.87	651	100.0	248	609
342.37	960	100.0	403	1,012
342.87	1,287	100.0	562	1,574
343.37	1,632	100.0	730	2,303

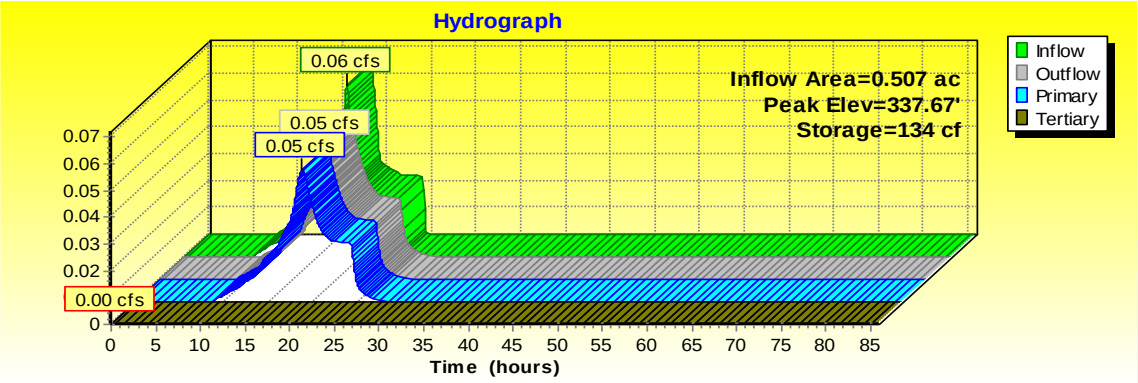
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	750	0.0	0	0
337.38	750	40.0	3	3
339.37	750	40.0	597	600
339.38	750	40.0	3	603
341.37	750	10.0	149	752
341.38	750	10.0	1	753
341.87	1,225	100.0	484	1,237
342.37	1,716	100.0	735	1,972
342.87	2,226	100.0	986	2,958
343.37	2,754	100.0	1,245	4,203

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.37'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.87'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.37'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.20'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.36 cfs @ 18.47 hrs HW=339.20' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.14 cfs @ 6.37 fps)
- **3=Orifice** (Orifice Controls 0.22 cfs @ 4.51 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.37' (Free Discharge)

DMA 12 & 13 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

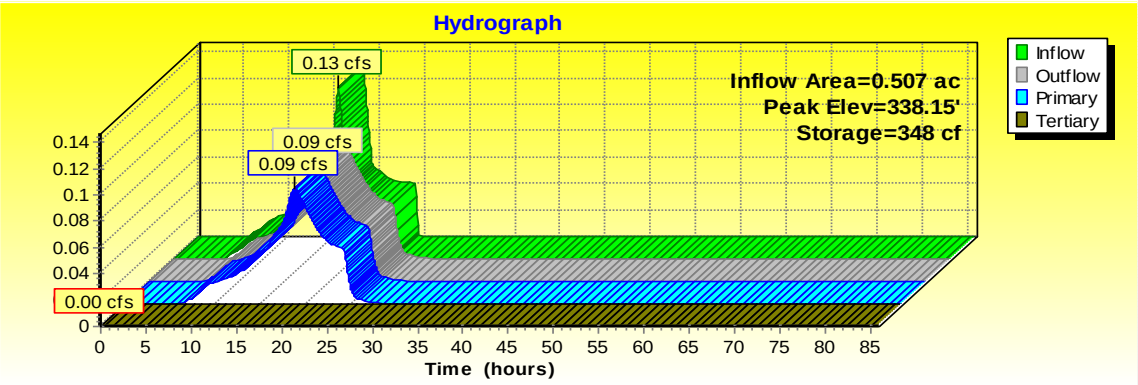
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

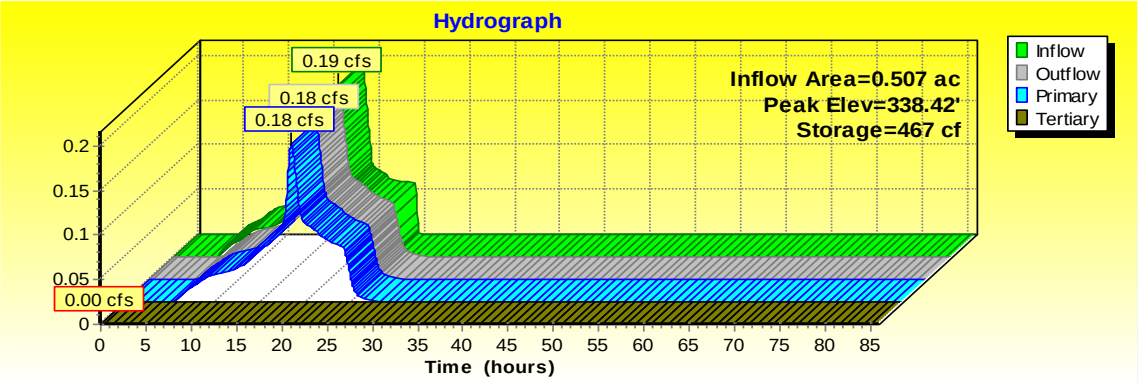
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

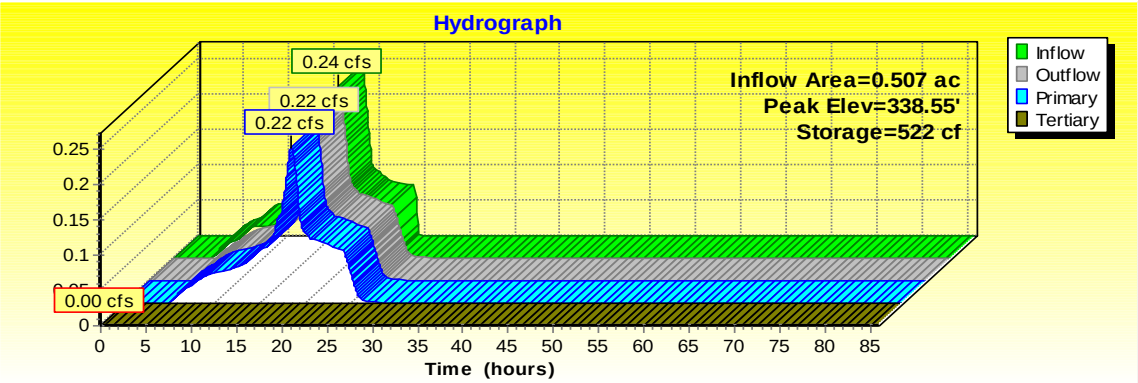
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

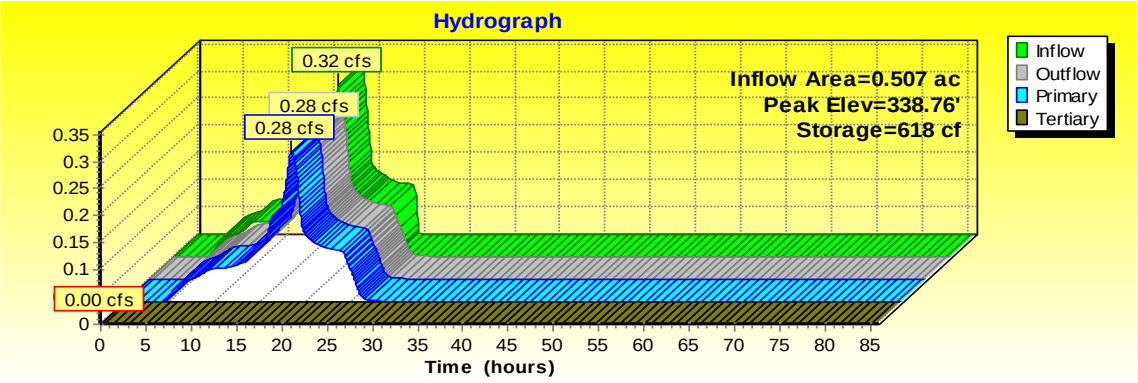
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

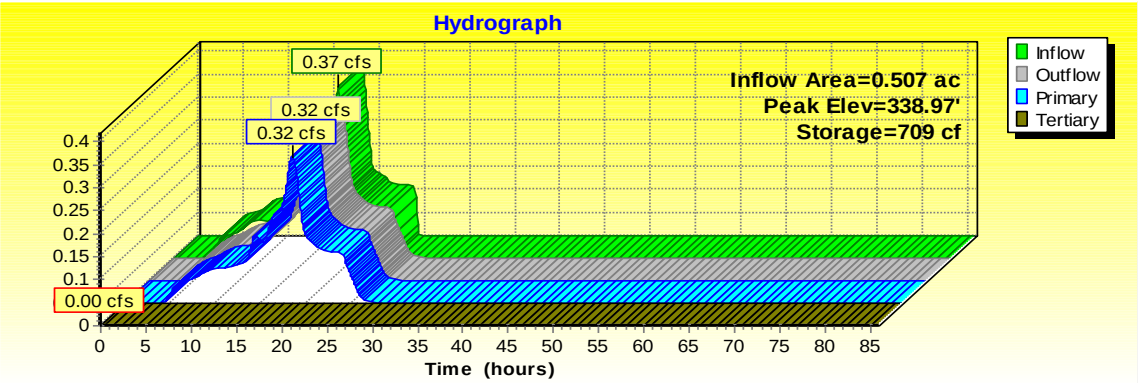
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

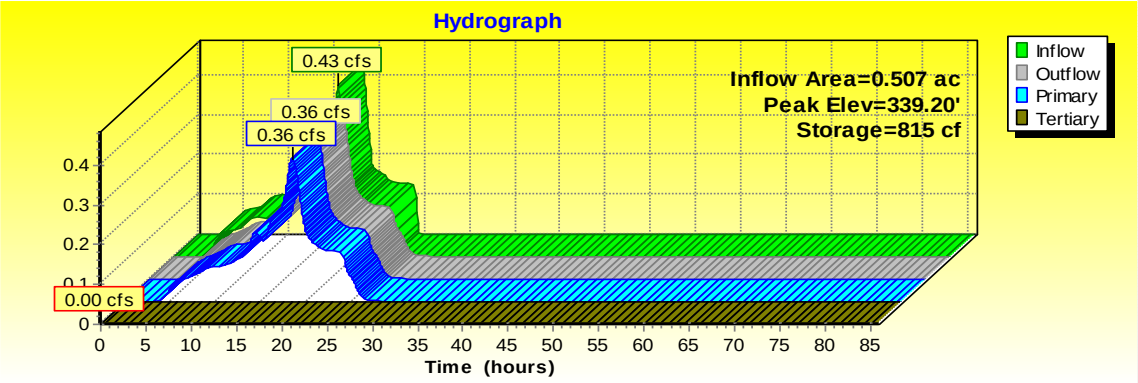
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 12 & 13 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

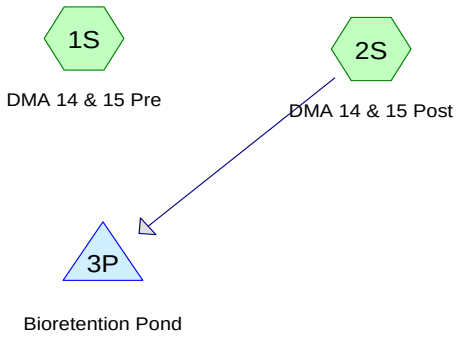
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 Event Summary



Events for Subcatchment 1S: DMA 14 & 15 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.034	0.47
2 year	2.90	0.19	0.085	1.18
5 year	3.84	0.30	0.138	1.91
10 year	4.62	0.39	0.186	2.56
25 year	5.72	0.51	0.256	3.53
50 year	6.59	0.61	0.313	4.32
100 year	**7.49**	**0.71**	**0.373**	**5.15**

Events for Subcatchment 2S: DMA 14 & 15 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.034	0.47
2 year	2.90	0.19	0.085	1.18
5 year	3.84	0.30	0.138	1.91
10 year	4.62	0.39	0.186	2.56
25 year	5.72	0.51	0.256	3.53
50 year	6.59	0.61	0.313	4.32
100 year	**7.49**	**0.71**	**0.373**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	337.52	76
2 year	0.19	0.18	0.18	0.00	337.65	139
5 year	0.30	0.27	0.27	0.00	337.83	231
10 year	0.39	0.34	0.34	0.00	338.03	330
25 year	0.51	0.47	0.47	0.00	338.32	481
50 year	0.61	0.58	0.58	0.00	338.45	545
100 year	**0.71**	**0.68**	**0.68**	0.00	**338.57**	**604**

DMA 14 & 15 Pre-Development

Summary for Subcatchment 1S: DMA 14 & 15 Pre

Runoff = 0.71 cfs @ 18.14 hrs, Volume= 0.373 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
37,854	80	>75% Grass cover, Good, HSG D
37,854		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 14 & 15 Post-Development

Summary for Subcatchment 2S: DMA 14 & 15 Post

Runoff = 0.71 cfs @ 18.14 hrs, Volume= 0.373 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,550	98	Roofs
*	28,304	74	>75% Grass cover, Good, HSG C
	37,854	80	Weighted Average
	28,304		74.77% Pervious Area
	9,550		25.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 14 & 15 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.869 ac, 25.23% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.71 cfs @ 18.14 hrs, Volume= 0.373 af
Outflow = 0.68 cfs @ 18.27 hrs, Volume= 0.373 af, Atten= 4%, Lag= 8.0 min
Primary = 0.68 cfs @ 18.27 hrs, Volume= 0.373 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.05 hrs
Peak Elev= 338.57' @ 18.27 hrs Surf.Area= 1,260 sf Storage= 604 cf

Plug-Flow detention time= 14.5 min calculated for 0.373 af (100% of inflow)
Center-of-Mass det. time= 14.6 min (983.6 - 969.0)

Volume	Invert	Avail.Storage	Storage Description
#1	337.37'	2,802 cf	**DMA 14 Bio-swale (Prismatic)** Listed below (Recalc)
#2	337.37'	4,939 cf	**DMA 15 Bio-swale (Prismatic)** Listed below (Recalc)
		7,742 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	460	0.0	0	0
337.38	460	40.0	2	2
339.37	460	40.0	366	368
339.38	460	40.0	2	370
341.37	460	10.0	92	461
341.38	460	10.0	0	462
341.87	826	100.0	315	777
342.37	1,210	100.0	509	1,286
342.87	1,612	100.0	706	1,991
343.37	1,632	100.0	811	2,802

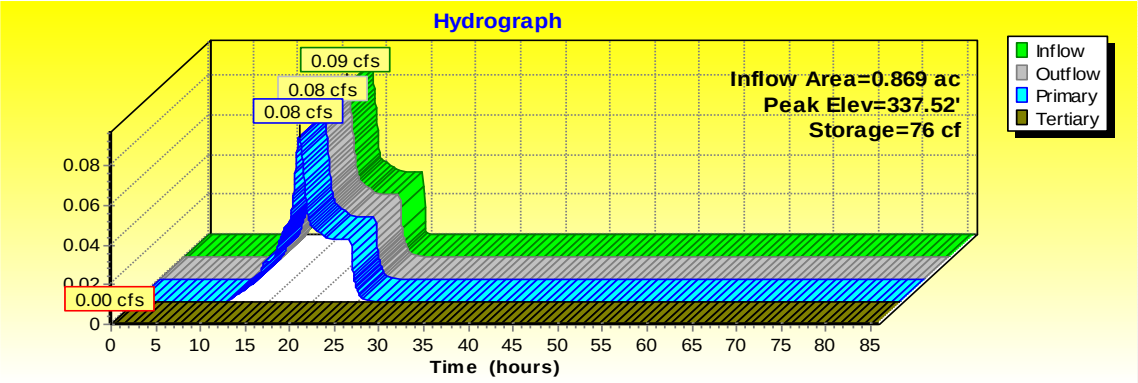
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.37	800	0.0	0	0
337.38	800	40.0	3	3
339.37	800	40.0	637	640
339.38	800	40.0	3	643
341.37	800	10.0	159	802
341.38	800	10.0	1	803
341.87	1,421	100.0	544	1,347
342.37	2,060	100.0	870	2,218
342.87	2,717	100.0	1,194	3,412
343.37	3,392	100.0	1,527	4,939

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.37'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.87'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.37'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.20'	**4.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.68 cfs @ 18.27 hrs HW=338.57' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.49 cfs @ 4.99 fps)
- **3=Orifice** (Orifice Controls 0.19 cfs @ 2.16 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.37' (Free Discharge)

DMA 14 & 15 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

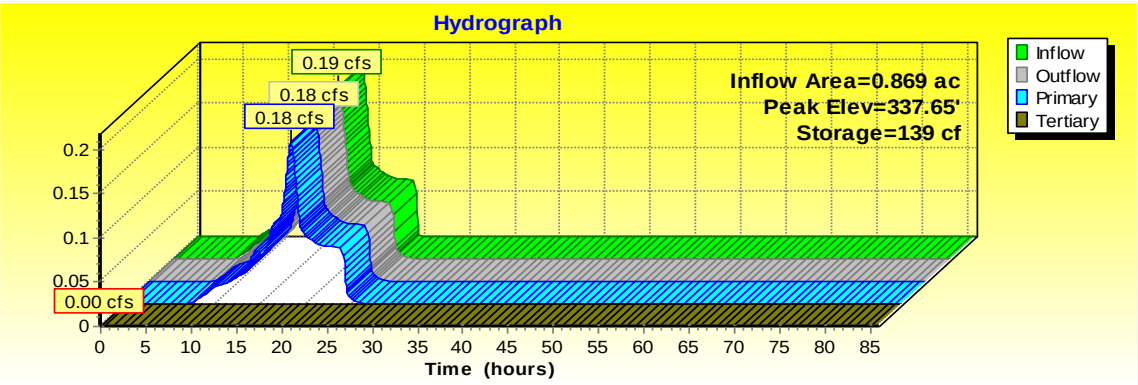
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

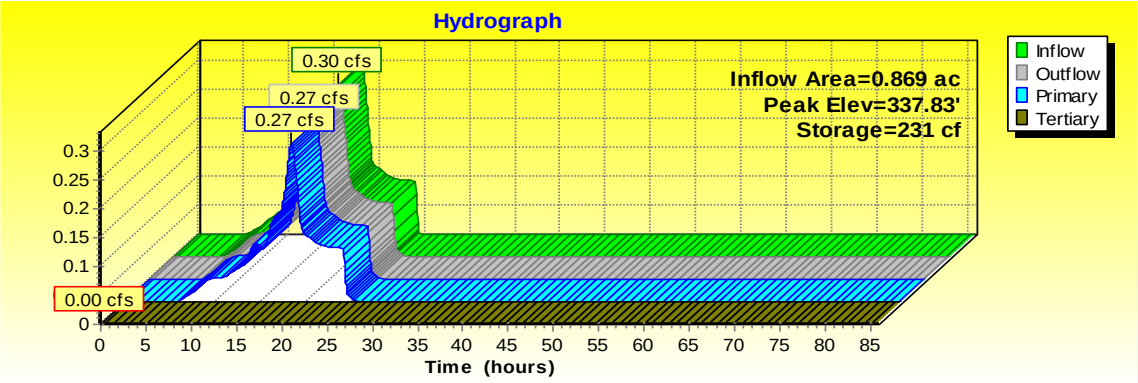
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

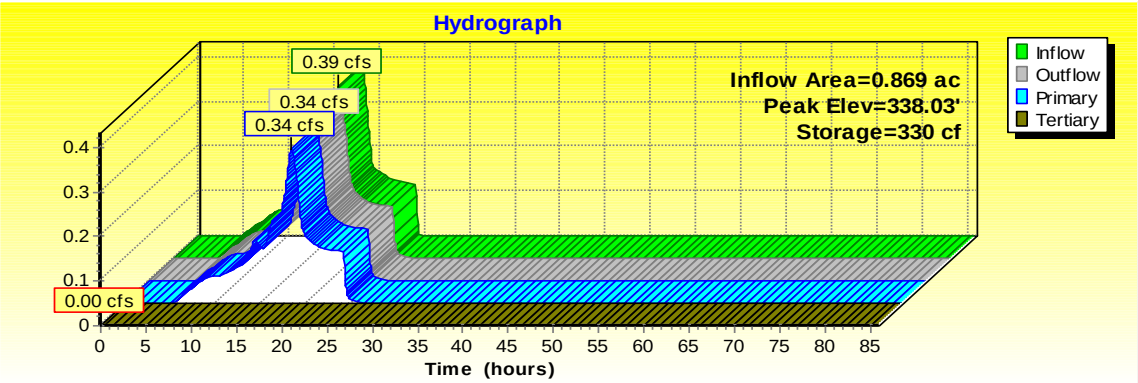
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

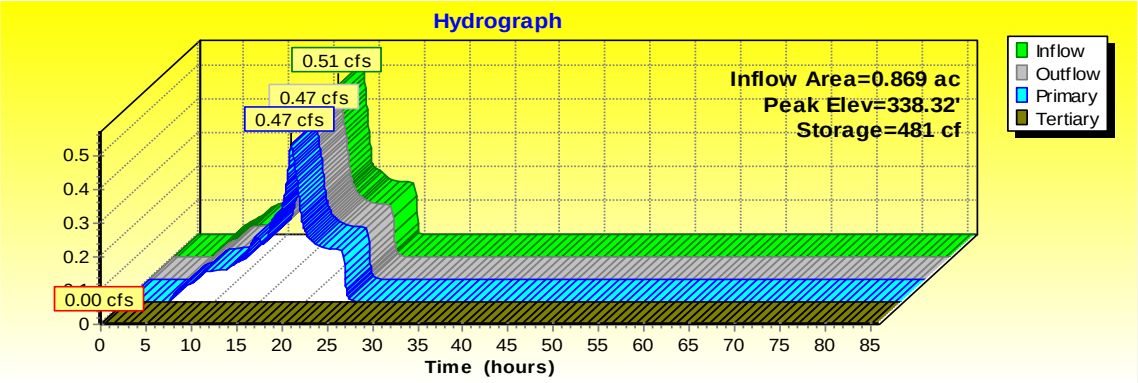
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

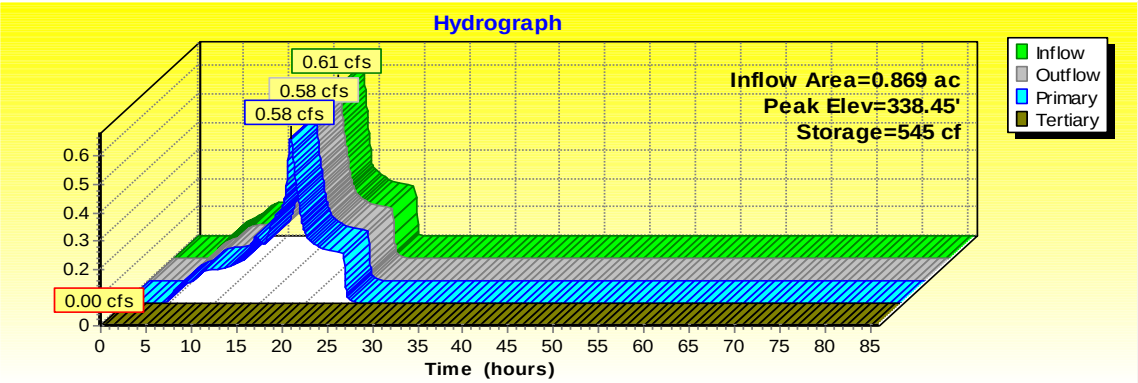
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

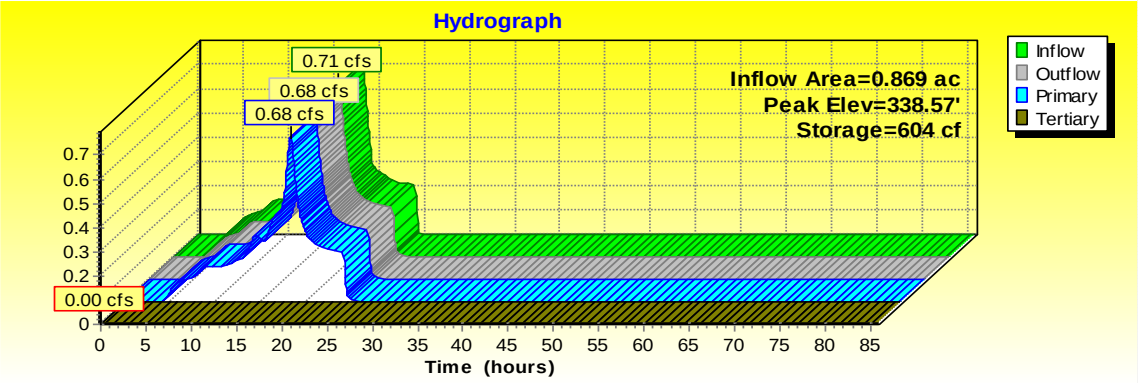
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 14 & 15 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

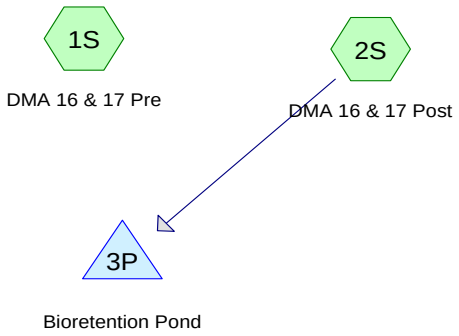
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 Event Summary



Events for Subcatchment 1S: DMA 16 & 17 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.08	0.034	0.47
2 year	2.90	0.19	0.084	1.18
5 year	3.84	0.28	0.136	1.91
10 year	4.62	0.37	0.183	2.56
25 year	5.72	0.49	0.252	3.53
50 year	6.59	0.58	0.308	4.32
100 year	**7.49**	**0.68**	**0.367**	**5.15**

Events for Subcatchment 2S: DMA 16 & 17 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.08	0.034	0.47
2 year	2.90	0.19	0.084	1.18
5 year	3.84	0.28	0.136	1.91
10 year	4.62	0.37	0.183	2.56
25 year	5.72	0.49	0.252	3.53
50 year	6.59	0.58	0.308	4.32
100 year	**7.49**	**0.68**	**0.367**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.08	0.07	0.07	**0.00**	337.08	107
2 year	0.19	0.15	0.15	0.00	337.46	301
5 year	0.28	0.21	0.21	0.00	337.99	572
10 year	0.37	0.33	0.33	0.00	338.27	716
25 year	0.49	0.43	0.43	0.00	338.60	886
50 year	0.58	0.51	0.51	0.00	338.95	1,038
100 year	**0.68**	**0.64**	**0.64**	0.00	**339.65**	**1,127**

DMA 16 & 17 Pre-Development

Summary for Subcatchment 1S: DMA 16 & 17 Pre

Runoff = 0.68 cfs @ 18.27 hrs, Volume= 0.367 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
37,287	80	>75% Grass cover, Good, HSG D
37,287		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 16 & 17 Post-Development

Summary for Subcatchment 2S: DMA 16 & 17 Post

Runoff = 0.68 cfs @ 18.27 hrs, Volume= 0.367 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	9,205	98	Roofs
*	28,082	74	>75% Grass cover, Good, HSG C
	37,287	80	Weighted Average
	28,082		75.31% Pervious Area
	9,205		24.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 16 & 17 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.856 ac, 24.69% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.68 cfs @ 18.27 hrs, Volume= 0.367 af
Outflow = 0.64 cfs @ 18.48 hrs, Volume= 0.367 af, Atten= 6%, Lag= 12.7 min
Primary = 0.64 cfs @ 18.48 hrs, Volume= 0.367 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 339.65' @ 18.48 hrs Surf.Area= 1,280 sf Storage= 1,127 cf

Plug-Flow detention time= 38.4 min calculated for 0.367 af (100% of inflow)
Center-of-Mass det. time= 36.5 min (1,014.8 - 978.3)

Volume	Invert	Avail.Storage	Storage Description
#1	336.87'	3,736 cf	**DMA 17 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.87'	4,220 cf	**DMA 16 Bio-swale (Prismatic)** Listed below (Recalc)
		7,956 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.87	600	0.0	0	0
336.88	600	40.0	2	2
338.87	600	40.0	478	480
338.88	600	40.0	2	482
340.87	600	10.0	119	602
340.88	600	10.0	1	602
341.37	1,071	100.0	409	1,012
341.88	1,560	100.0	671	1,683
342.37	2,067	100.0	889	2,571
342.87	2,592	100.0	1,165	3,736

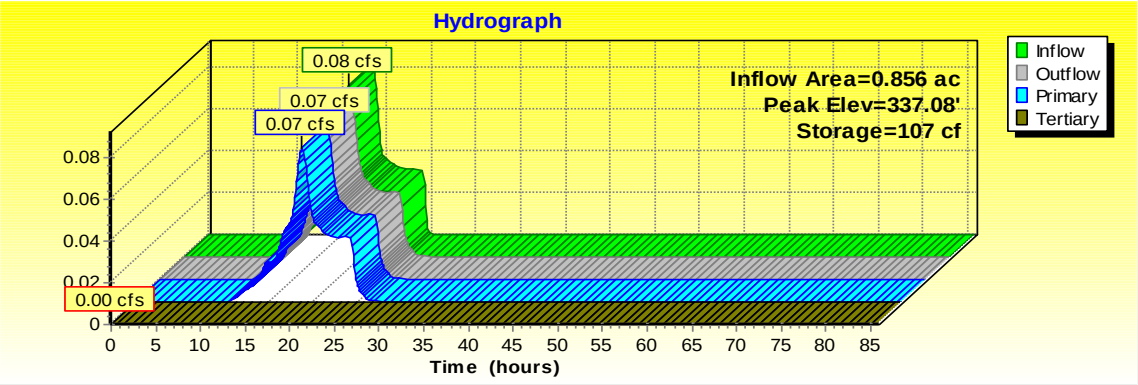
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.87	680	0.0	0	0
336.88	680	40.0	3	3
338.87	680	40.0	541	544
338.88	680	40.0	3	547
340.87	680	10.0	135	682
340.88	680	10.0	1	683
341.37	1,211	100.0	463	1,146
341.87	1,760	100.0	743	1,889
342.37	2,327	100.0	1,022	2,911
342.87	2,912	100.0	1,310	4,220

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.87'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.37'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.87'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.00'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.64 cfs @ 18.48 hrs HW=339.64' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.34 cfs @ 7.89 fps)
- **3=Orifice** (Orifice Controls 0.29 cfs @ 5.93 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.87' (Free Discharge)

DMA 16 & 17 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

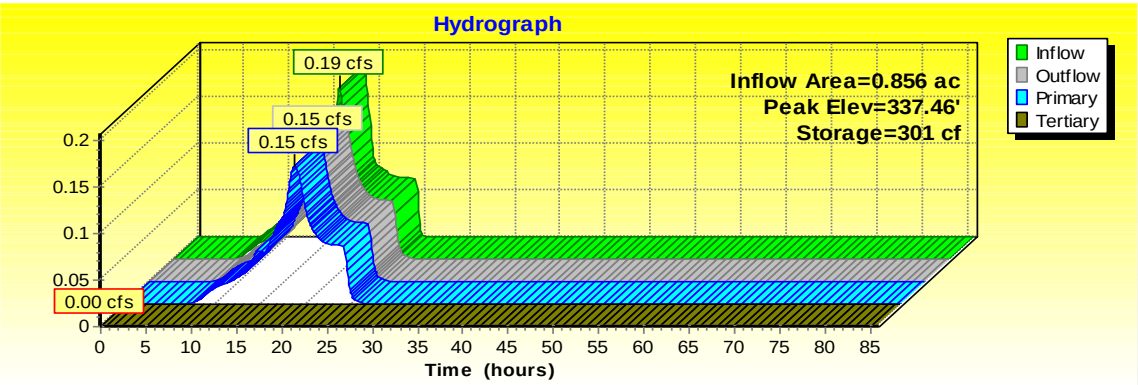
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

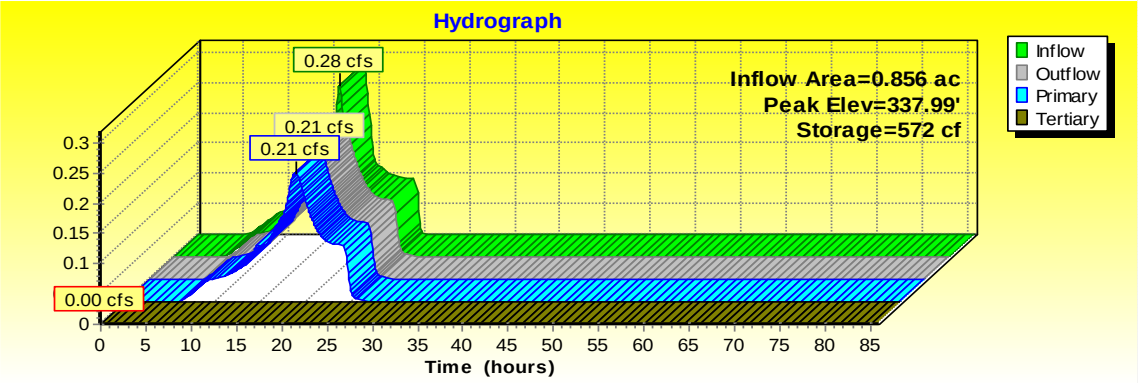
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

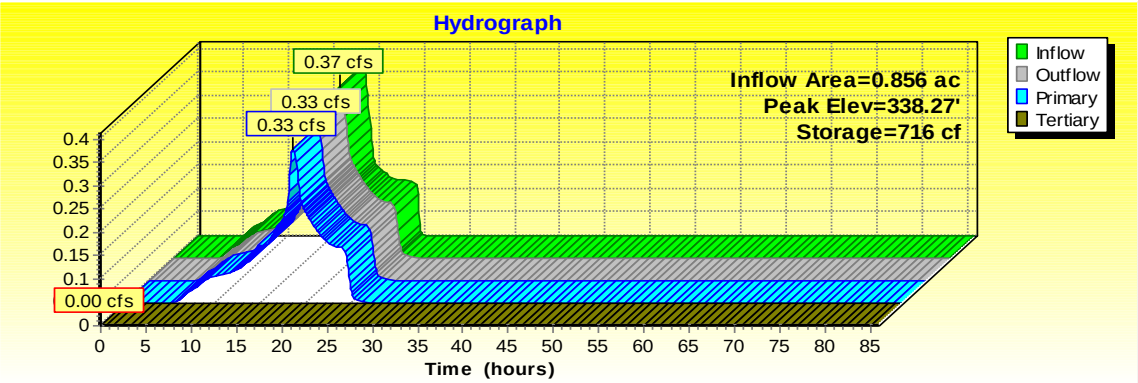
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

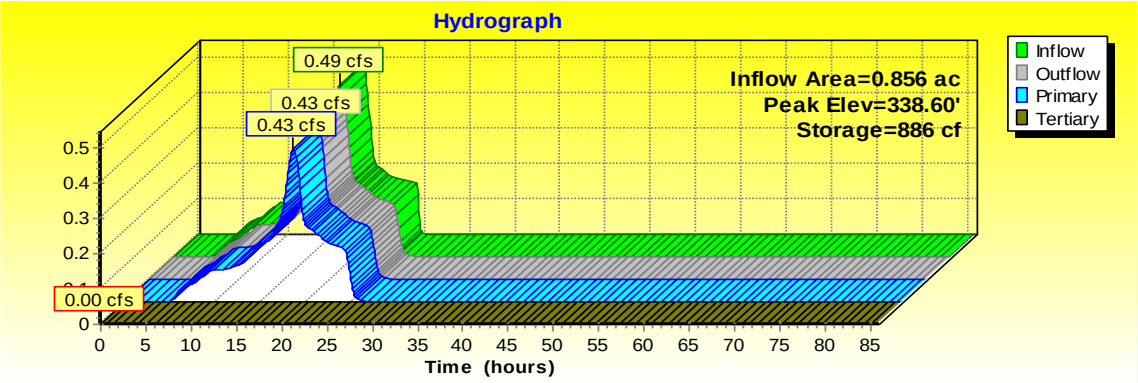
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

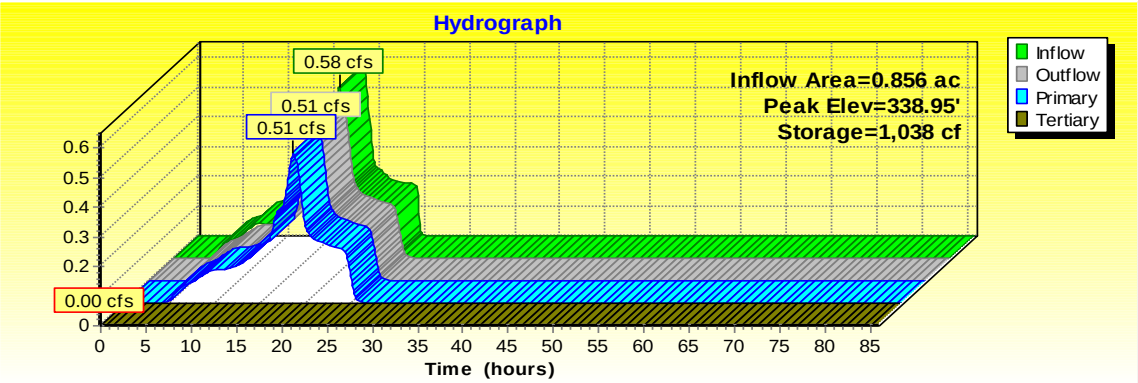
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

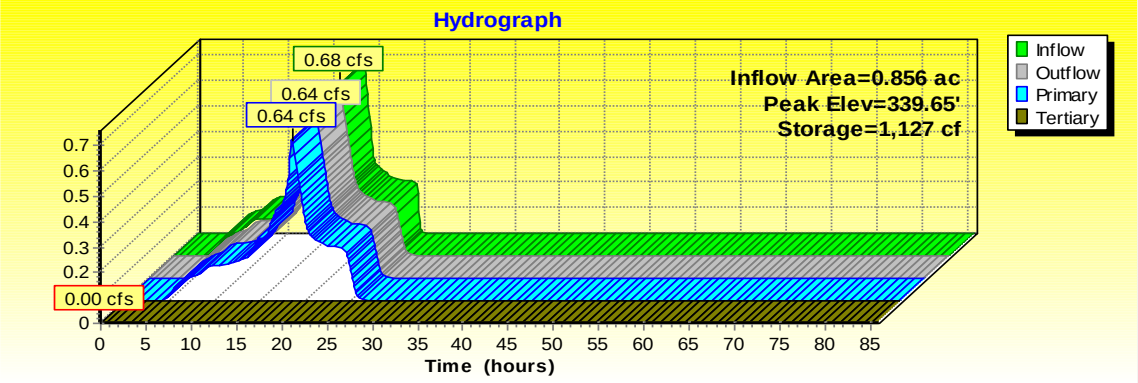
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 16 & 17 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

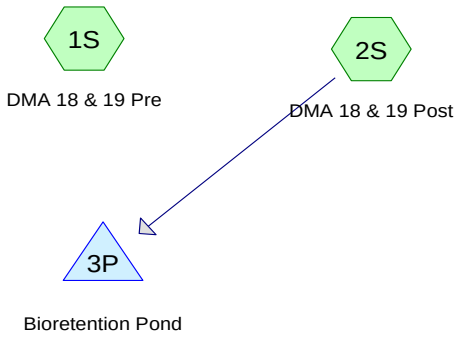
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 Event Summary



Events for Subcatchment 1S: DMA 18 & 19 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.14	0.058	0.47
2 year	2.90	0.32	0.144	1.18
5 year	3.84	0.49	0.234	1.91
10 year	4.62	0.63	0.314	2.56
25 year	5.72	0.84	0.432	3.53
50 year	6.59	1.00	0.529	4.32
100 year	**7.49**	**1.16**	**0.631**	**5.15**

Events for Subcatchment 2S: DMA 18 & 19 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.18	0.078	0.64
2 year	2.90	0.37	0.176	1.43
5 year	3.84	0.54	0.273	2.23
10 year	4.62	0.69	0.358	2.92
25 year	5.72	0.89	0.482	3.94
50 year	6.59	1.05	0.582	4.75
100 year	**7.49**	**1.22**	**0.687**	**5.61**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.18	0.14	0.14	**0.00**	336.45	376
2 year	0.37	0.26	0.26	0.00	336.91	972
5 year	0.54	0.35	0.35	0.00	337.48	1,719
10 year	0.69	0.42	0.42	0.00	338.05	2,457
25 year	0.89	0.57	0.57	0.00	338.97	3,588
50 year	1.05	0.75	0.75	0.00	339.50	4,245
100 year	**1.22**	**0.93**	**0.93**	0.00	**340.05**	**4,914**

DMA 18 & 19 Pre-Development

Summary for Subcatchment 1S: DMA 18 & 19 Pre

Runoff = 1.16 cfs @ 18.27 hrs, Volume= 0.631 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
64,033	80	>75% Grass cover, Good, HSG D
64,033		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 18 & 19 Post-Development

Summary for Subcatchment 2S: DMA 18 & 19 Post

Runoff = 1.22 cfs @ 18.27 hrs, Volume= 0.687 af, Depth= 5.61"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	27,929	98	Roofs
*	36,104	74	>75% Grass cover, Good, HSG C
	64,033	84	Weighted Average
	36,104		56.38% Pervious Area
	27,929		43.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 18 & 19 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.470 ac, 43.62% Impervious, Inflow Depth = 5.61" for 100 year event
Inflow = 1.22 cfs @ 18.27 hrs, Volume= 0.687 af
Outflow = 0.93 cfs @ 18.77 hrs, Volume= 0.687 af, Atten= 23%, Lag= 30.0 min
Primary = 0.93 cfs @ 18.77 hrs, Volume= 0.687 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.05' @ 18.77 hrs Surf.Area= 3,250 sf Storage= 4,914 cf

Plug-Flow detention time= 86.4 min calculated for 0.686 af (100% of inflow)
Center-of-Mass det. time= 86.9 min (1,043.9 - 957.0)

Volume	Invert	Avail.Storage	Storage Description
#1	336.16'	9,940 cf	**DMA 19 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.16'	7,350 cf	**DMA 18 Bio-swale (Prismatic)** Listed below (Recalc)
		17,289 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.16	2,250	0.0	0	0
336.17	2,250	40.0	9	9
338.16	2,250	40.0	1,791	1,800
338.17	2,250	40.0	9	1,809
340.16	2,250	10.0	448	2,257
340.17	2,250	10.0	2	2,259
340.66	3,036	100.0	1,295	3,554
341.16	3,840	100.0	1,719	5,273
341.66	4,662	100.0	2,126	7,399
342.16	5,502	100.0	2,541	9,940

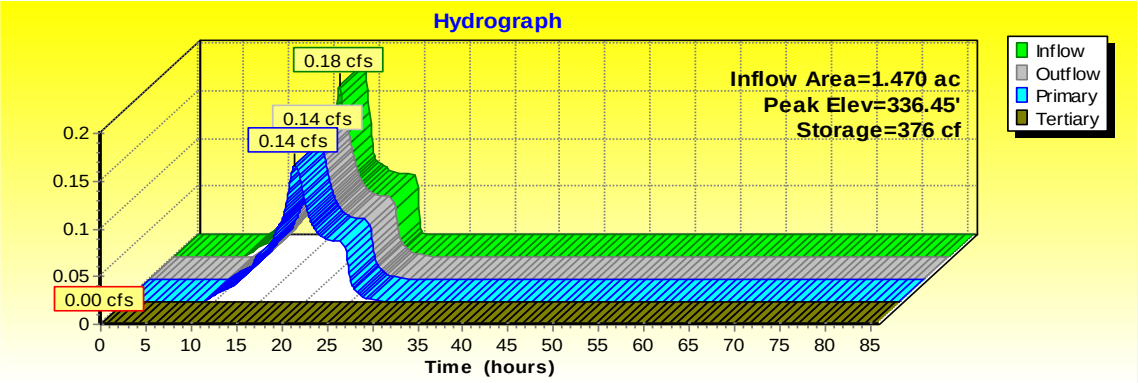
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.16	1,000	0.0	0	0
336.17	1,000	40.0	4	4
338.16	1,000	40.0	796	800
338.17	1,000	40.0	4	804
340.17	1,000	100.0	2,000	2,804
340.66	1,624	100.0	643	3,447
341.16	2,266	100.0	973	4,419
341.66	2,926	100.0	1,298	5,717
342.16	3,604	100.0	1,633	7,350

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.16'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.66'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.16'	**2.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.80'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.92 cfs @ 18.77 hrs HW=340.05' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.61 cfs @ 9.39 fps)
- **3=Orifice** (Orifice Controls 0.25 cfs @ 5.10 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.63 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.16' (Free Discharge)

DMA 18 & 19 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

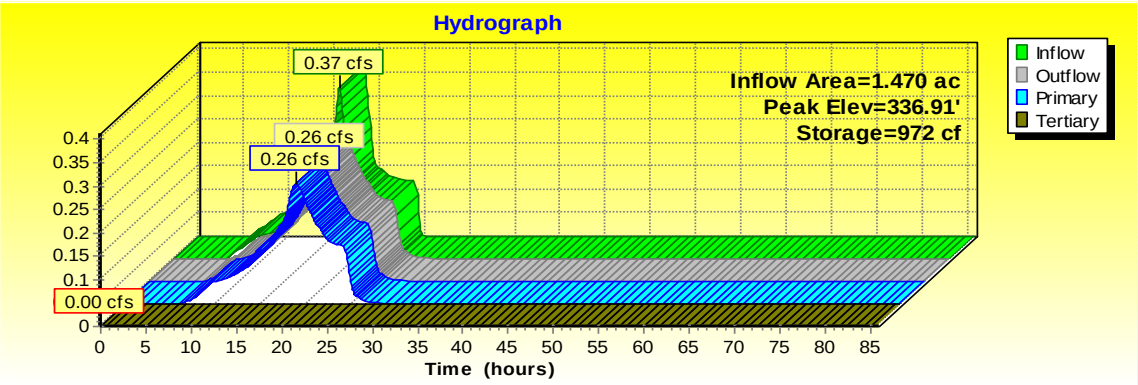
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

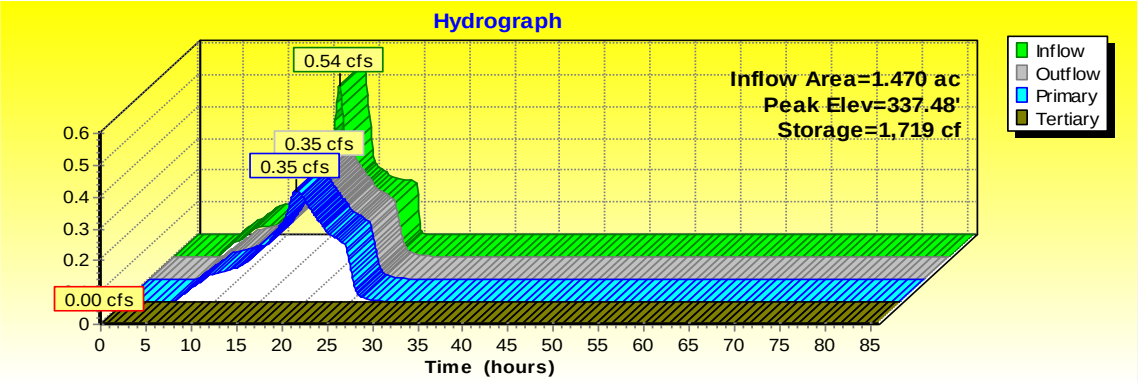
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

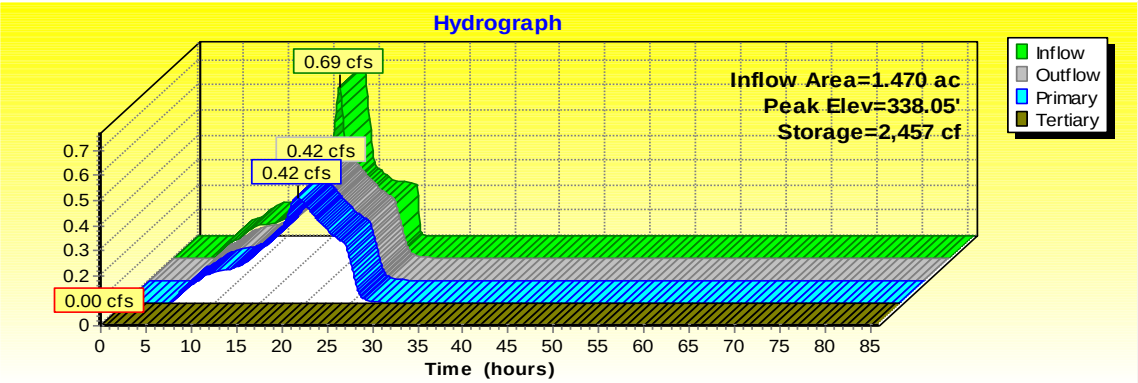
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

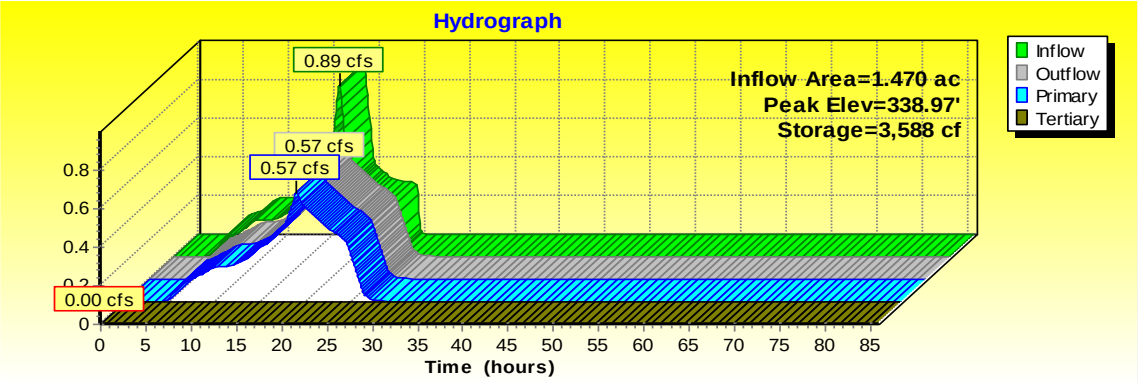
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

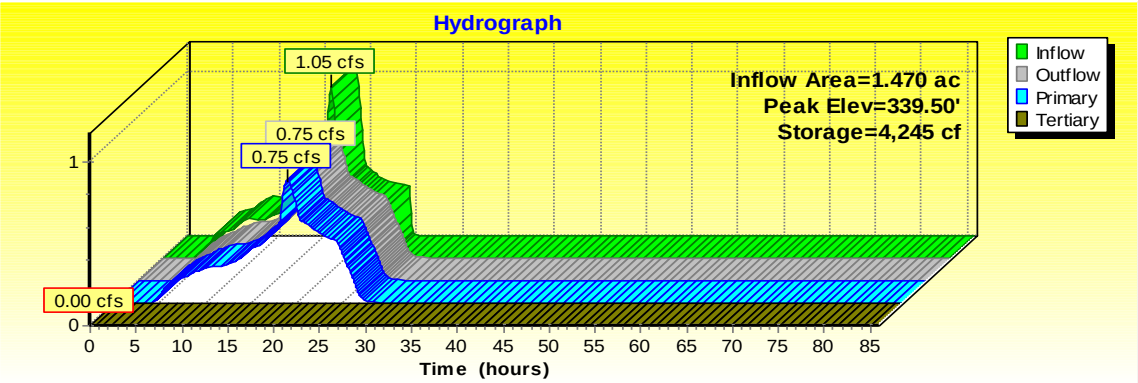
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

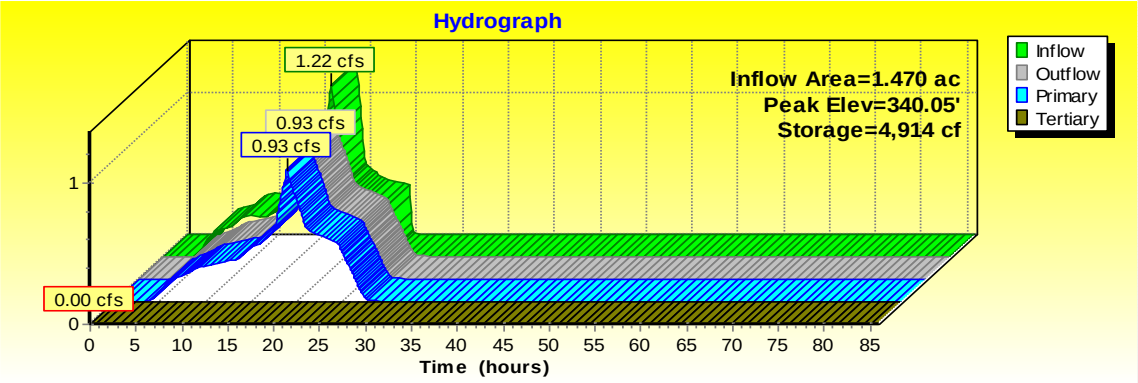
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 18 & 19 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

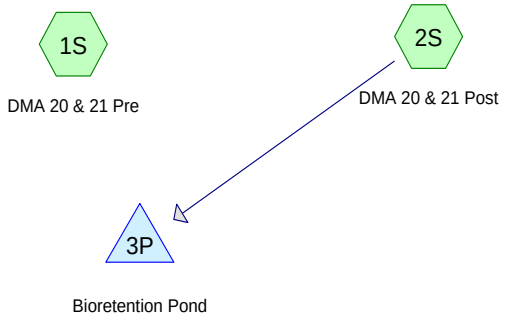
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 Event Summary



Events for Subcatchment 1S: DMA 20 & 21 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.043	0.47
2 year	2.90	0.24	0.107	1.18
5 year	3.84	0.37	0.173	1.91
10 year	4.62	0.48	0.233	2.56
25 year	5.72	0.64	0.320	3.53
50 year	6.59	0.76	0.392	4.32
100 year	**7.49**	**0.89**	**0.467**	**5.15**

Events for Subcatchment 2S: DMA 20 & 21 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.046	0.51
2 year	2.90	0.25	0.112	1.24
5 year	3.84	0.38	0.180	1.99
10 year	4.62	0.49	0.241	2.65
25 year	5.72	0.64	0.329	3.63
50 year	6.59	0.76	0.402	4.43
100 year	**7.49**	**0.89**	**0.478**	**5.26**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.11	0.11	0.11	**0.00**	336.31	123
2 year	0.25	0.23	0.23	0.00	336.49	245
5 year	0.38	0.33	0.33	0.00	336.74	421
10 year	0.49	0.41	0.41	0.00	337.01	607
25 year	0.64	0.52	0.52	0.00	337.47	924
50 year	0.76	0.60	0.60	0.00	337.89	1,213
100 year	**0.89**	**0.80**	**0.80**	0.00	**338.45**	**1,434**

DMA 20 & 21 Pre-Development

Summary for Subcatchment 1S: DMA 20 & 21 Pre

Runoff = 0.89 cfs @ 18.14 hrs, Volume= 0.467 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
47,437	80	>75% Grass cover, Good, HSG D
47,437		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 20 & 21 Post-Development

Summary for Subcatchment 2S: DMA 20 & 21 Post

Runoff = 0.89 cfs @ 18.21 hrs, Volume= 0.478 af, Depth= 5.26"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
14,748	98	Roofs, HSG C
32,689	74	>75% Grass cover, Good, HSG C
47,437	81	Weighted Average
32,689		68.91% Pervious Area
14,748		31.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 20 & 21 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.089 ac, 31.09% Impervious, Inflow Depth = 5.26" for 100 year event
Inflow = 0.89 cfs @ 18.21 hrs, Volume= 0.478 af
Outflow = 0.80 cfs @ 18.45 hrs, Volume= 0.478 af, Atten= 10%, Lag= 14.6 min
Primary = 0.80 cfs @ 18.45 hrs, Volume= 0.478 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 338.45' @ 18.45 hrs Surf.Area= 1,725 sf Storage= 1,434 cf

Plug-Flow detention time= 23.8 min calculated for 0.478 af (100% of inflow)
Center-of-Mass det. time= 23.6 min (992.1 - 968.5)

Volume	Invert	Avail.Storage	Storage Description
#1	336.13'	4,881 cf	**DMA 21 Bio-swale (Prismatic)** Listed below (Recalc)
#2	336.13'	4,749 cf	**DMA 20 Bio-swale (Prismatic)** Listed below (Recalc)
		9,630 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.13	875	0.0	0	0
336.14	875	40.0	3	3
338.13	875	40.0	697	700
338.14	875	10.0	1	701
340.13	875	10.0	174	875
340.14	875	100.0	9	884
340.63	1,424	100.0	563	1,447
341.13	1,991	100.0	854	2,301
341.63	2,576	100.0	1,142	3,443
342.13	3,179	100.0	1,439	4,881

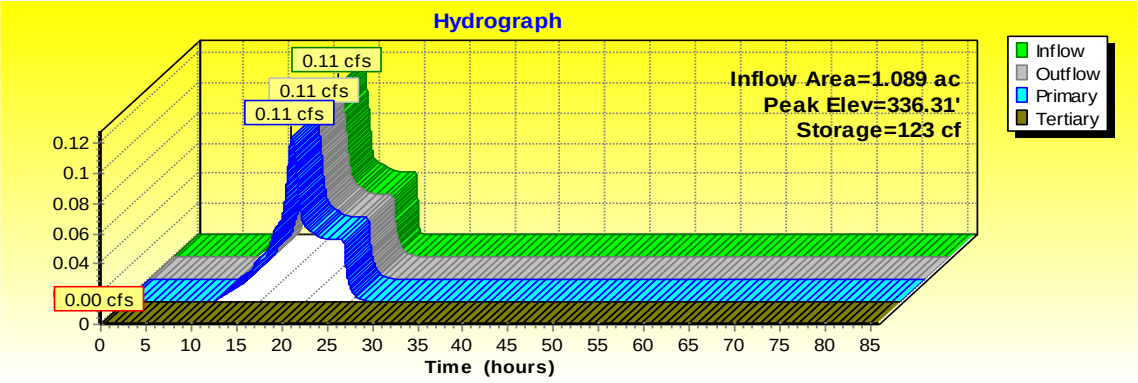
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.13	850	0.0	0	0
336.14	850	40.0	3	3
338.13	850	40.0	677	680
338.14	850	10.0	1	681
340.13	850	10.0	169	850
340.63	1,384	100.0	559	1,409
341.13	1,936	100.0	830	2,239
341.63	2,506	100.0	1,111	3,349
342.13	3,094	100.0	1,400	4,749

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.13'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.13'	**24.0" W x 24.0" H Vert. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.13'	**3.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.13'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.80 cfs @ 18.45 hrs HW=338.45' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.70 cfs @ 7.13 fps)
- **3=Orifice** (Orifice Controls 0.10 cfs @ 2.32 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.13' (Free Discharge)

DMA 20 & 21 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

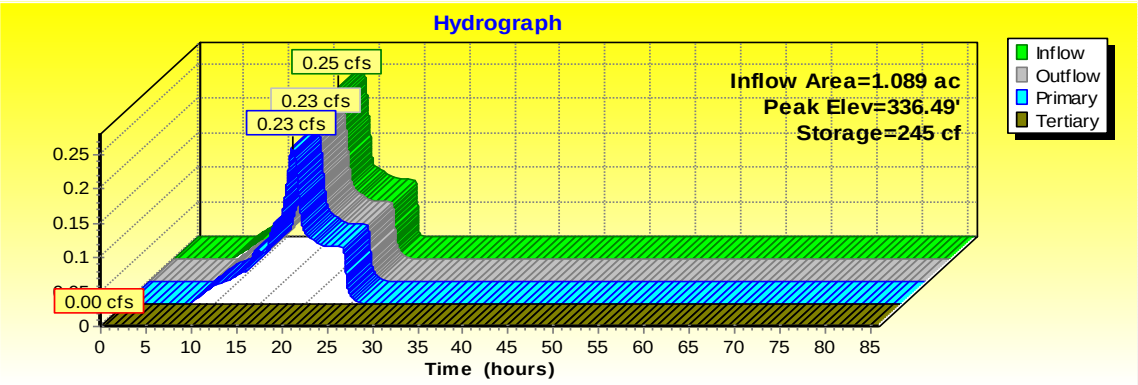
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

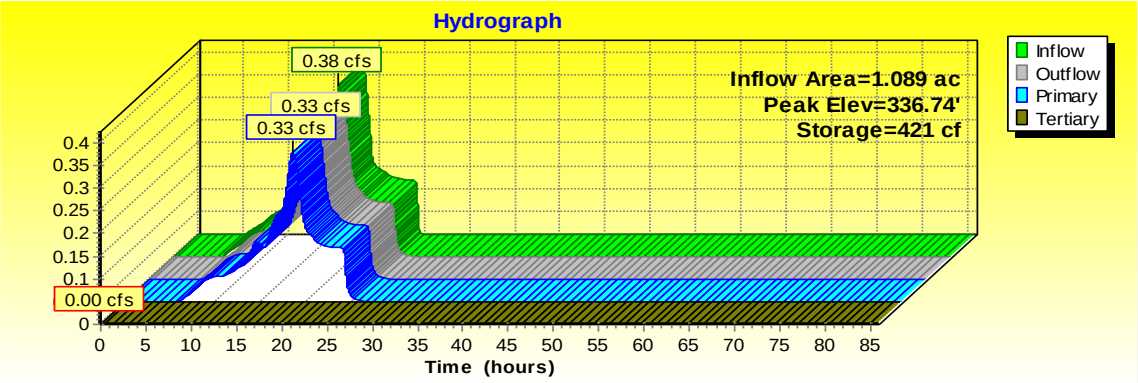
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

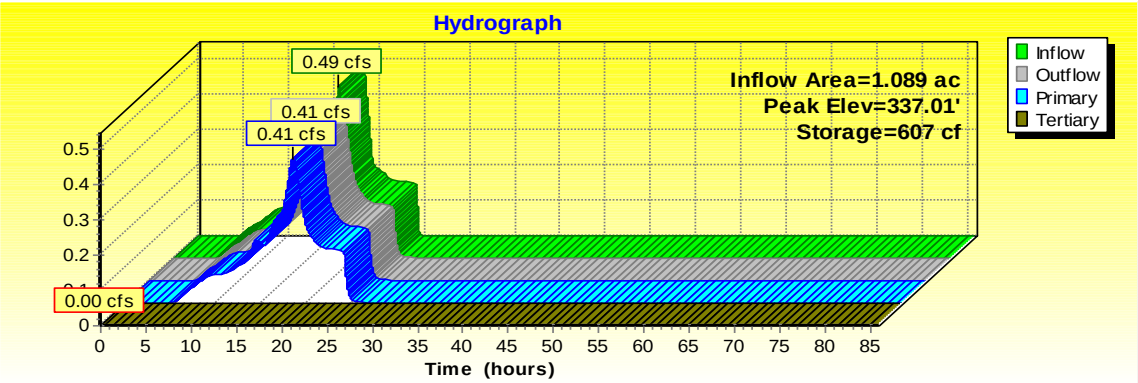
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

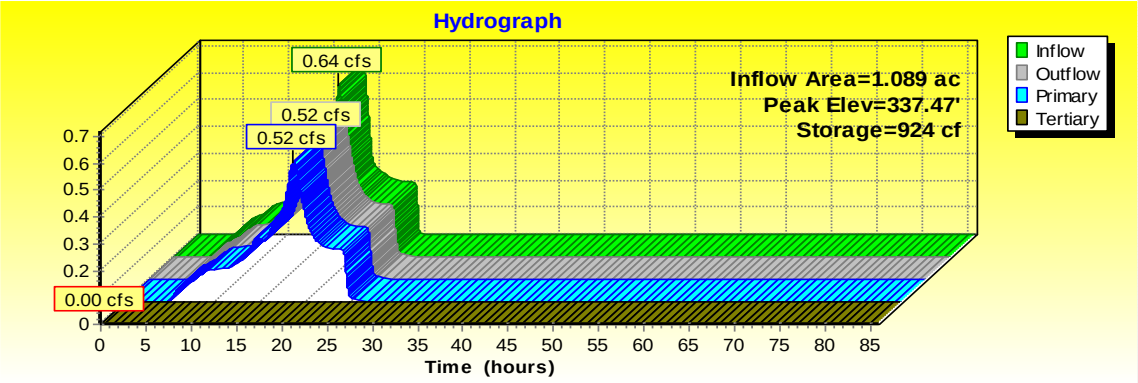
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

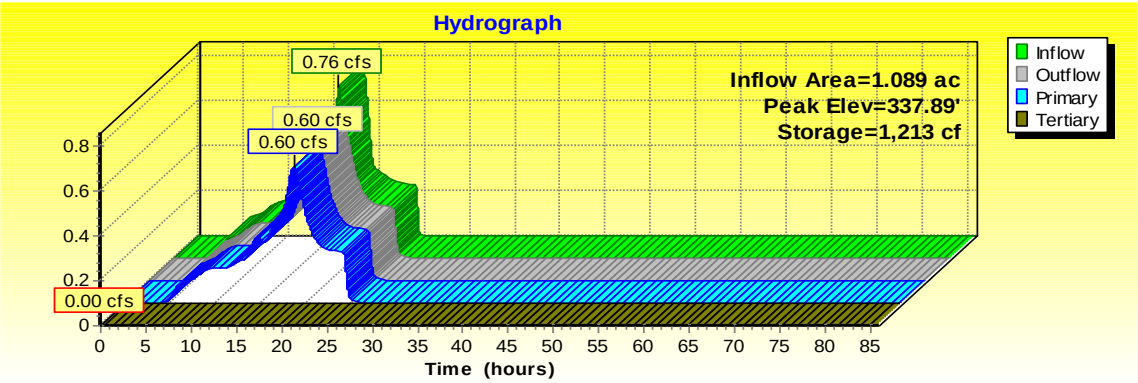
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

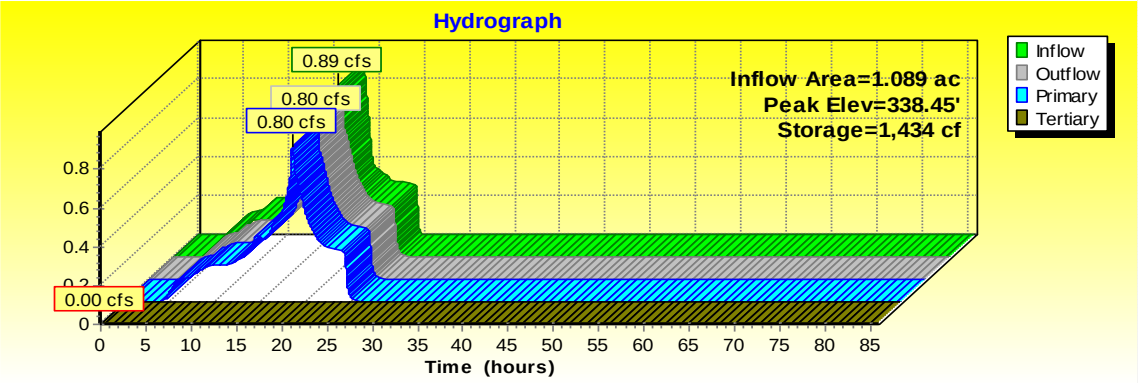
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 20 & 21 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

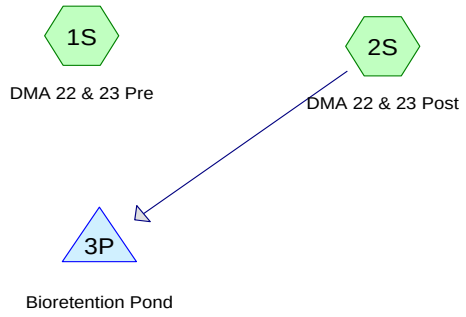
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 Event Summary



Events for Subcatchment 1S: DMA 22 & 23 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.038	0.47
1 year	2.21	0.14	0.056	0.69
2 year	2.90	0.22	0.094	1.18
5 year	3.84	0.33	0.153	1.91
10 year	4.62	0.43	0.206	2.56
25 year	5.72	0.57	0.283	3.53
50 year	6.59	0.68	0.346	4.32
100 year	**7.49**	**0.79**	**0.413**	**5.15**

Events for Subcatchment 2S: DMA 22 & 23 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.044	0.55
1 year	2.21	0.15	0.063	0.79
2 year	2.90	0.23	0.104	1.30
5 year	3.84	0.34	0.166	2.07
10 year	4.62	0.44	0.220	2.74
25 year	5.72	0.58	0.299	3.73
50 year	6.59	0.68	0.364	4.53
100 year	**7.49**	**0.79**	**0.432**	**5.38**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.11	0.10	0.10	**0.00**	337.83	116
1 year	0.15	0.13	0.13	0.00	337.91	165
2 year	0.23	0.19	0.19	0.00	338.11	293
5 year	0.34	0.27	0.27	0.00	338.49	536
10 year	0.44	0.36	0.36	0.00	338.83	754
25 year	0.58	0.47	0.47	0.00	339.28	1,045
50 year	0.68	0.55	0.55	0.00	339.75	1,297
100 year	**0.79**	**0.79**	**0.79**	0.00	**340.10**	**1,352**

DMA 22 & 23 Pre-Development

Summary for Subcatchment 1S: DMA 22 & 23 Pre

Runoff = 0.79 cfs @ 18.14 hrs, Volume= 0.413 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
41,948	80	>75% Grass cover, Good, HSG D
41,948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 22 & 23 Post-Development

Summary for Subcatchment 2S: DMA 22 & 23 Post

Runoff = 0.79 cfs @ 18.21 hrs, Volume= 0.432 af, Depth= 5.38"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
13,132	98	Roofs, HSG C
28,816	74	>75% Grass cover, Good, HSG C
41,948	82	Weighted Average
28,816		68.69% Pervious Area
13,132		31.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 22 & 23 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.963 ac, 31.31% Impervious, Inflow Depth = 5.38" for 100 year event
Inflow = 0.79 cfs @ 18.21 hrs, Volume= 0.432 af
Outflow = 0.79 cfs @ 18.23 hrs, Volume= 0.432 af, Atten= 0%, Lag= 1.3 min
Primary = 0.79 cfs @ 18.23 hrs, Volume= 0.432 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.10' @ 18.23 hrs Surf.Area= 1,600 sf Storage= 1,352 cf

Plug-Flow detention time= 31.4 min calculated for 0.432 af (100% of inflow)
Center-of-Mass det. time= 31.2 min (994.5 - 963.2)

Volume	Invert	Avail.Storage	Storage Description
#1	337.65'	3,958 cf	**DMA 22 bio-swale (Prismatic)** Listed below (Recalc)
#2	337.65'	4,223 cf	**DMA 23 bio-swale (Prismatic)** Listed below (Recalc)
		8,182 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.65	600	0.0	0	0
337.66	600	40.0	2	2
339.65	600	40.0	478	480
339.66	600	10.0	1	481
340.65	600	10.0	59	540
340.66	600	100.0	6	546
341.15	1,224	100.0	447	993
341.65	1,716	100.0	735	1,728
342.15	2,226	100.0	986	2,713
342.65	2,754	100.0	1,245	3,958

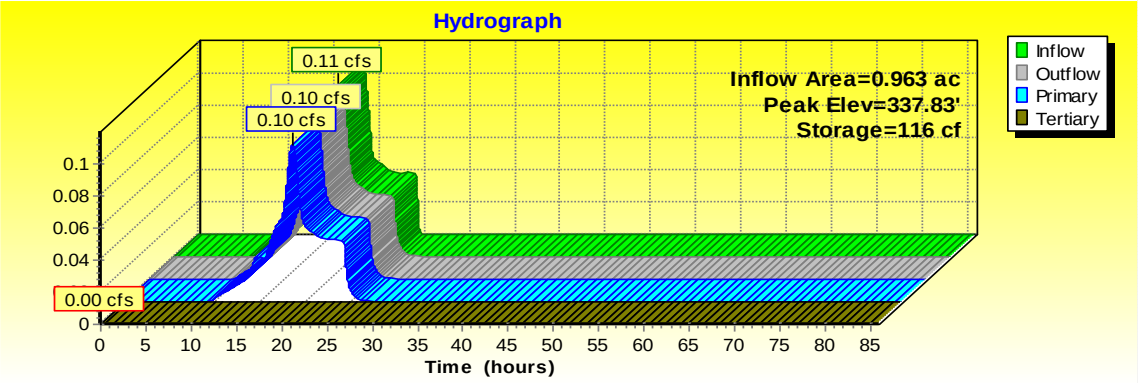
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.65	1,000	0.0	0	0
337.66	1,000	40.0	4	4
339.65	1,000	40.0	796	800
341.65	1,000	10.0	200	1,000
341.66	1,000	10.0	1	1,001
342.15	1,624	100.0	643	1,644
342.65	2,884	100.0	1,127	2,771
343.15	2,926	100.0	1,453	4,223

Device	Routing	Invert	Outlet Devices
#0	Tertiary	343.15'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	342.15'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.65'	**2.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	338.65'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.79 cfs @ 18.23 hrs HW=340.10' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.48 cfs @ 7.40 fps)
- **3=Orifice** (Orifice Controls 0.12 cfs @ 5.63 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.91 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.65' (Free Discharge)

DMA 22 & 23 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

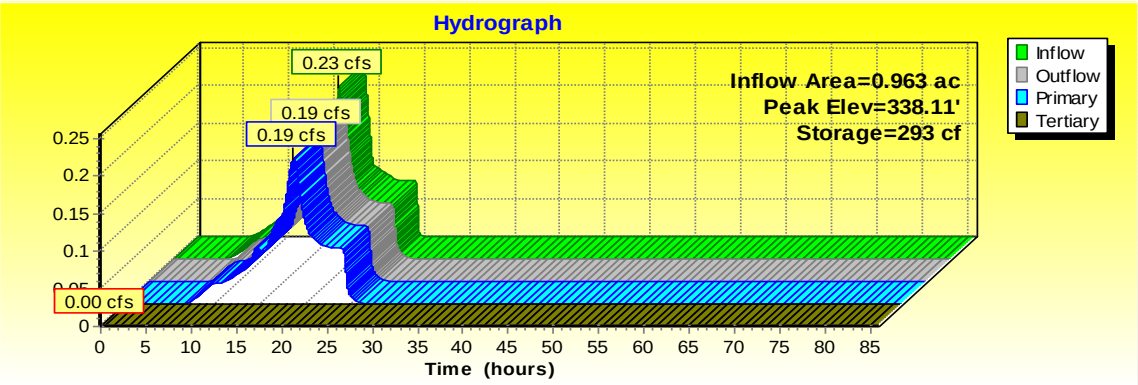
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

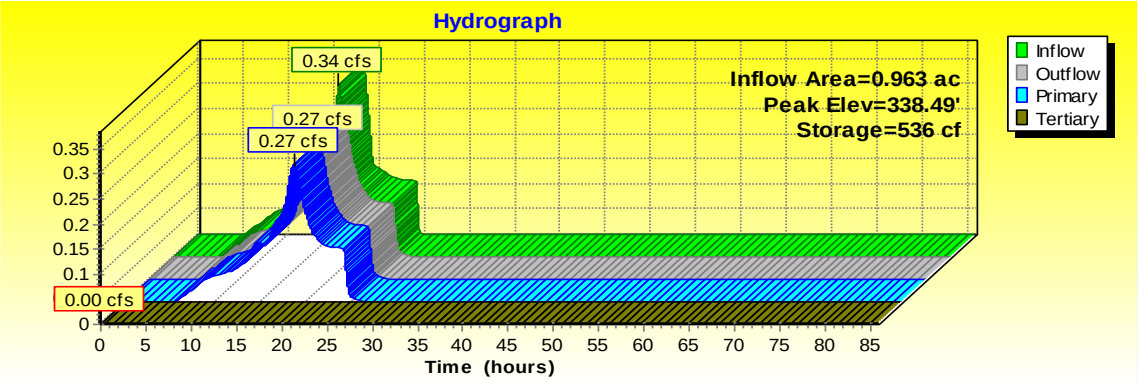
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

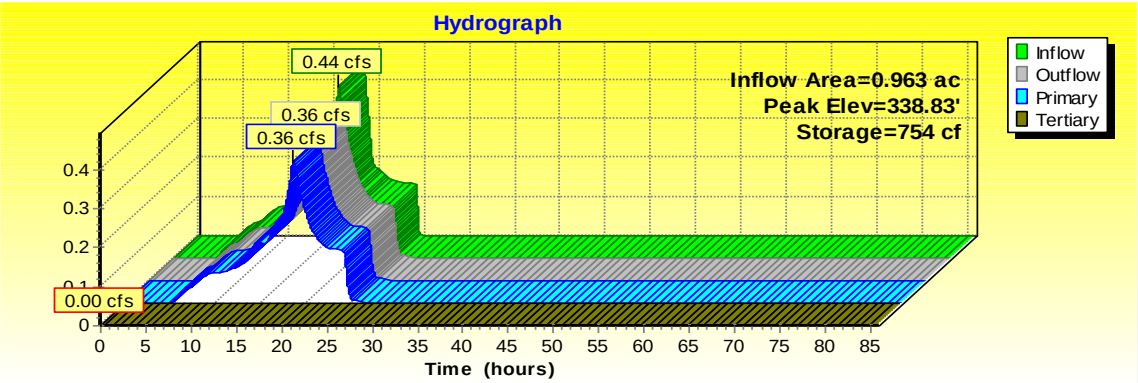
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

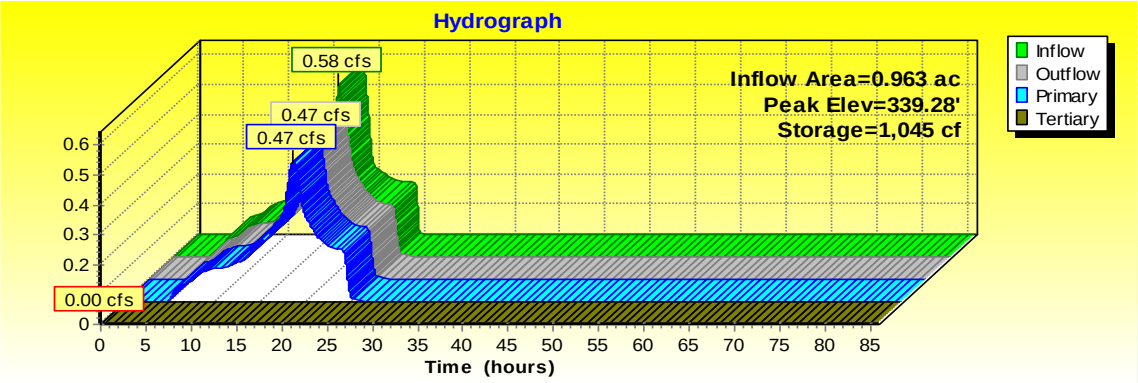
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

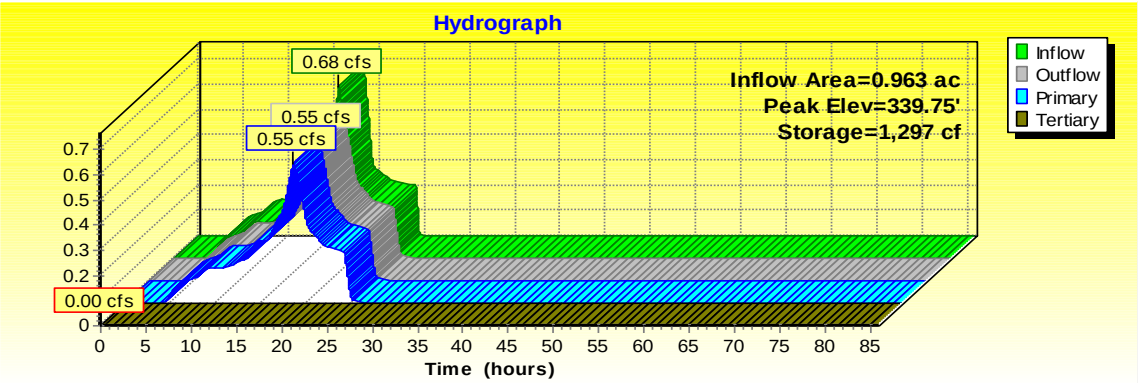
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

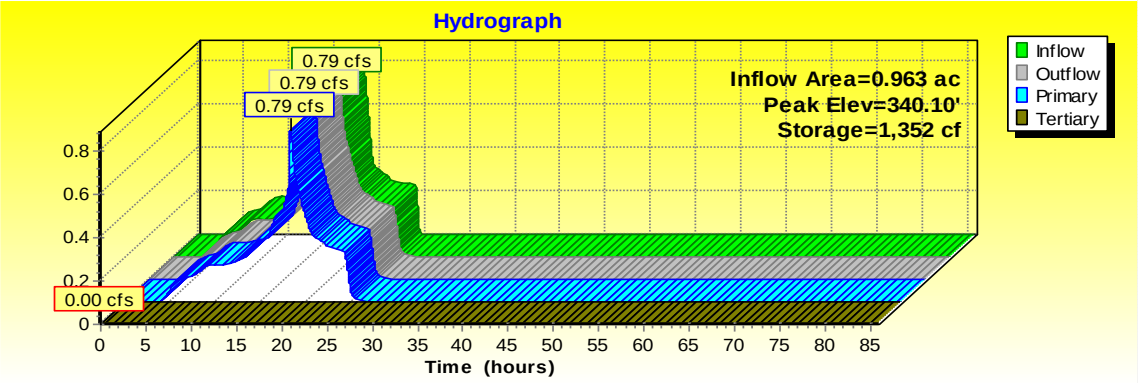
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 22 & 23 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

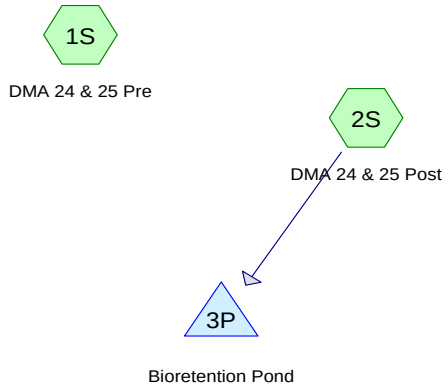
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 Event Summary



Events for Subcatchment 1S: DMA 24 & 25 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.038	0.47
2 year	2.90	0.21	0.094	1.18
5 year	3.84	0.33	0.152	1.91
10 year	4.62	0.42	0.204	2.56
25 year	5.72	0.56	0.281	3.53
50 year	6.59	0.67	0.344	4.32
100 year	**7.49**	**0.78**	**0.410**	**5.15**

Events for Subcatchment 2S: DMA 24 & 25 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.09	0.035	0.44
2 year	2.90	0.20	0.089	1.12
5 year	3.84	0.31	0.146	1.83
10 year	4.62	0.41	0.197	2.48
25 year	5.72	0.54	0.273	3.43
50 year	6.59	0.65	0.335	4.21
100 year	**7.49**	**0.76**	**0.401**	**5.03**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.09	0.08	0.08	**0.00**	336.46	102
2 year	0.20	0.16	0.16	0.00	336.92	309
5 year	0.31	0.23	0.23	0.00	337.56	603
10 year	0.41	0.29	0.29	0.00	338.24	911
25 year	0.54	0.35	0.35	0.00	339.03	1,479
50 year	0.65	0.38	0.38	0.00	339.65	2,031
100 year	**0.76**	**0.59**	**0.59**	0.00	**340.10**	**2,481**

DMA 24 & 25 Pre-Development

Summary for Subcatchment 1S: DMA 24 & 25 Pre

Runoff = 0.78 cfs @ 18.14 hrs, Volume= 0.410 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
41,600	80	>75% Grass cover, Good, HSG D
41,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 24 & 25 Post-Development

Summary for Subcatchment 2S: DMA 24 & 25 Post

Runoff = 0.76 cfs @ 18.21 hrs, Volume= 0.401 af, Depth= 5.03"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
8,309	98	Roofs, HSG C
33,291	74	>75% Grass cover, Good, HSG C
41,600	79	Weighted Average
33,291		80.03% Pervious Area
8,309		19.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 24 & 25 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.955 ac, 19.97% Impervious, Inflow Depth = 5.03" for 100 year event
Inflow = 0.76 cfs @ 18.21 hrs, Volume= 0.401 af
Outflow = 0.59 cfs @ 18.65 hrs, Volume= 0.401 af, Atten= 22%, Lag= 26.6 min
Primary = 0.59 cfs @ 18.65 hrs, Volume= 0.401 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.10' @ 18.65 hrs Surf.Area= 560 sf Storage= 2,481 cf

Plug-Flow detention time= 58.1 min calculated for 0.401 af (100% of inflow)
Center-of-Mass det. time= 57.9 min (1,036.7 - 978.8)

Volume	Invert	Avail.Storage	Storage Description
#1	336.24'	3,188 cf	**DMA 24 bio-swale (Prismatic)** Listed below (Recalc)
#2	336.24'	4,756 cf	**DMA 25 Bio-swale (Prismatic)** Listed below (Recalc) -Impervious
		7,944 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.24	560	0.0	0	0
336.25	560	40.0	2	2
338.24	560	40.0	446	448
338.25	560	10.0	1	449
340.24	560	10.0	111	560
340.25	560	10.0	1	561
341.74	1,001	100.0	1,163	1,724
342.24	1,460	100.0	615	2,339
342.74	1,937	100.0	849	3,188

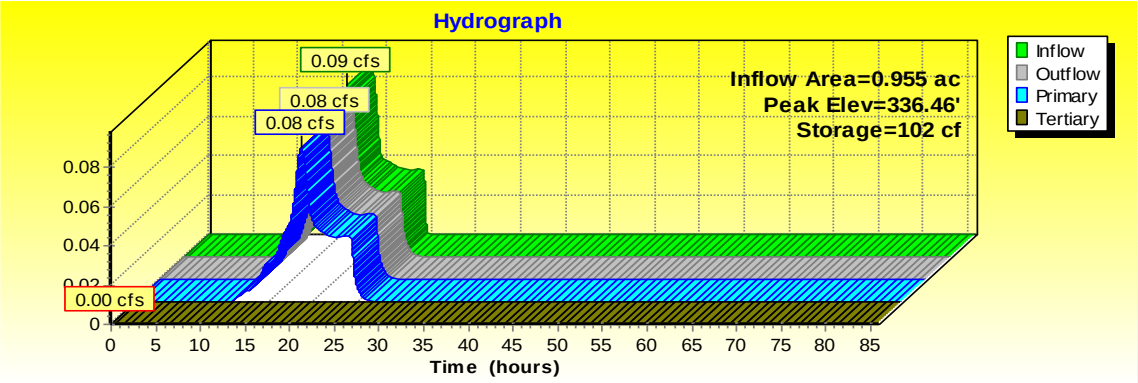
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.24	580	0.0	0	0
336.25	580	40.0	2	2
338.24	580	40.0	462	464
338.25	580	40.0	2	466
340.24	1,036	100.0	1,608	2,074
340.74	1,510	100.0	637	2,711
341.24	2,002	100.0	878	3,589
341.74	2,669	100.0	1,168	4,756

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.74'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	340.74'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.24'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.59 cfs @ 18.65 hrs HW=340.10' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.41 cfs @ 9.35 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.91 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.24' (Free Discharge)

DMA 24 & 25 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

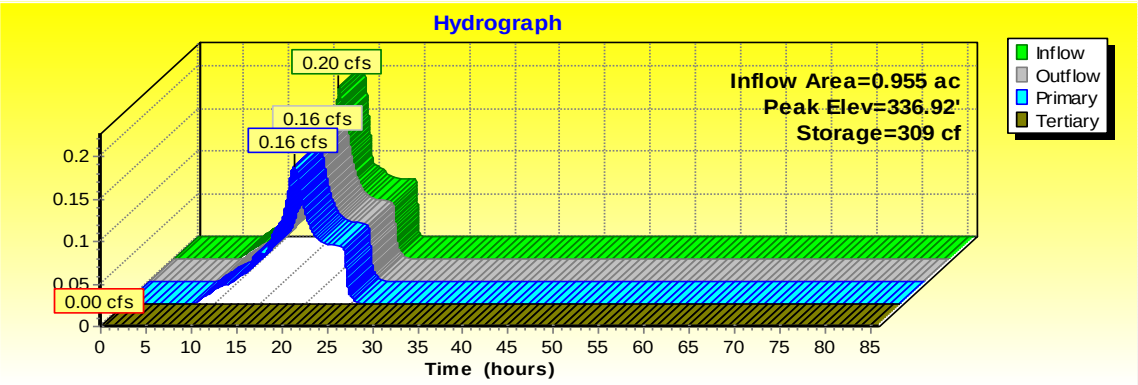
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

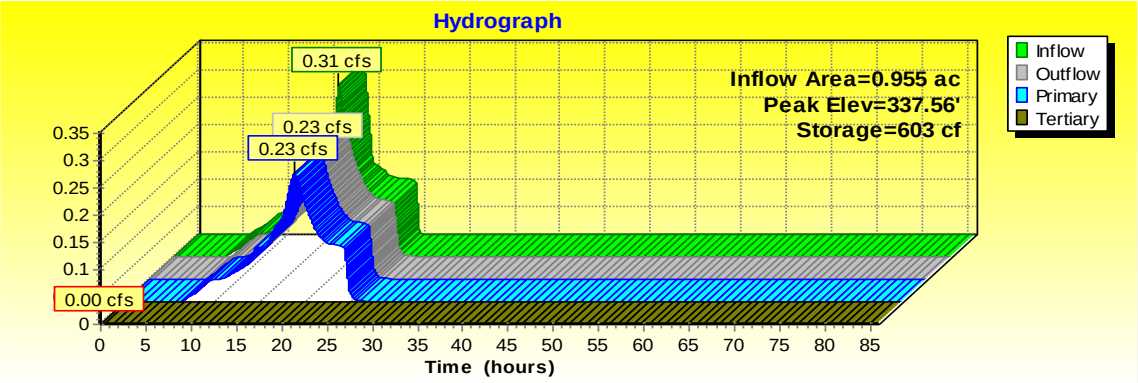
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

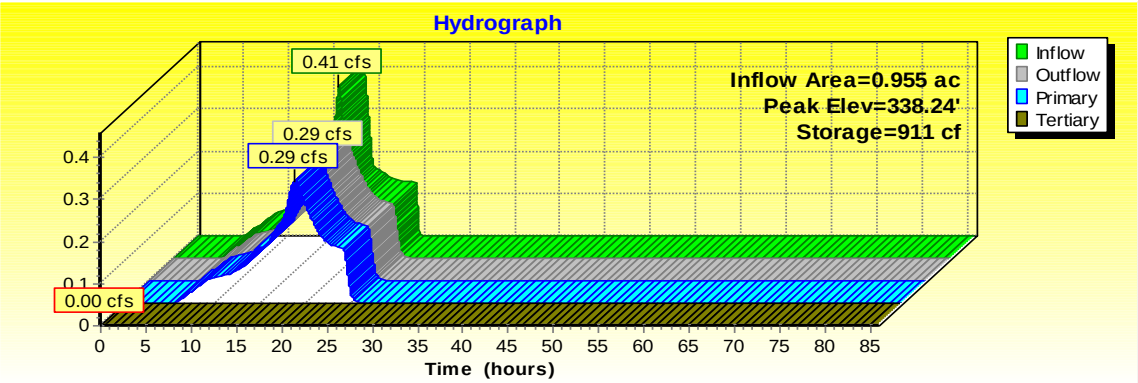
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

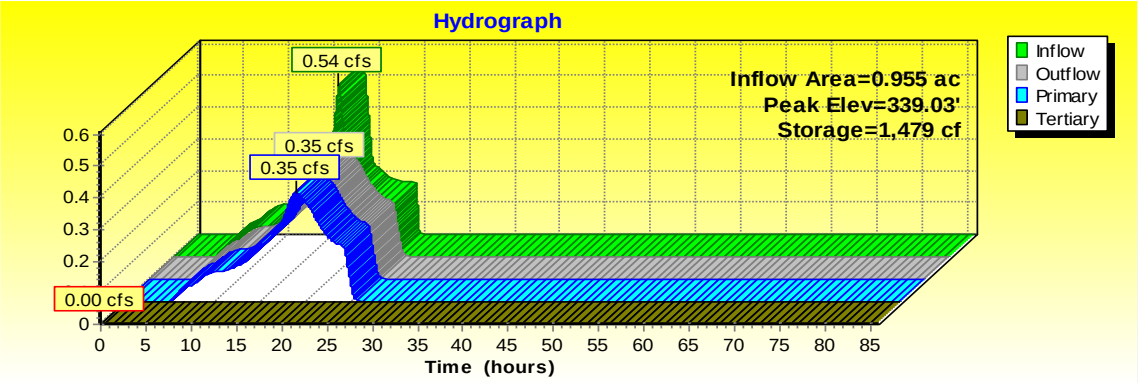
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

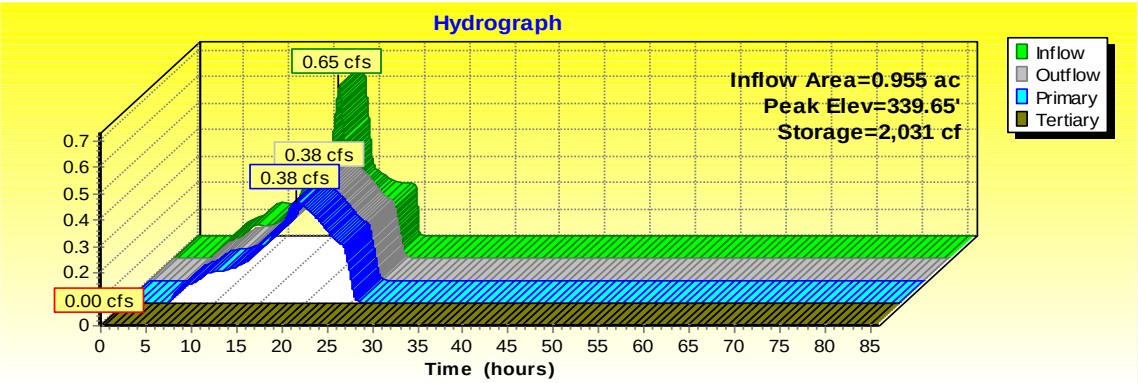
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

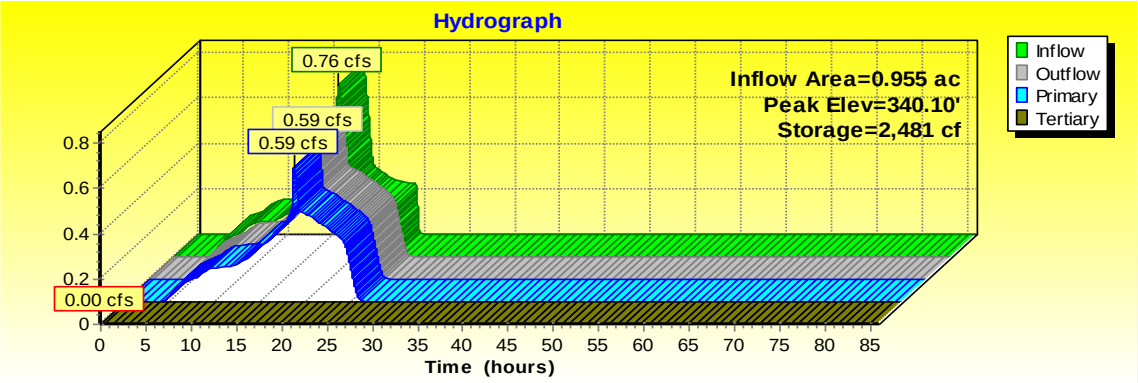
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 24 & 25 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

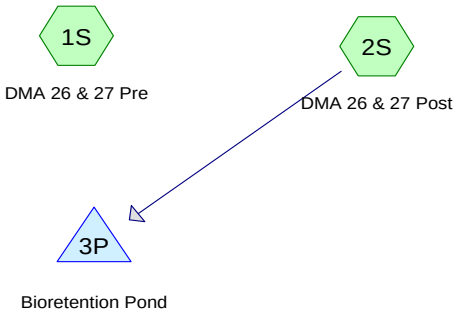
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 Event Summary



Events for Subcatchment 1S: DMA 26 & 27 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.039	0.47
2 year	2.90	0.22	0.098	1.18
5 year	3.84	0.34	0.159	1.91
10 year	4.62	0.44	0.213	2.56
25 year	5.72	0.59	0.294	3.53
50 year	6.59	0.70	0.359	4.32
100 year	**7.49**	**0.82**	**0.428**	**5.15**

Events for Subcatchment 2S: DMA 26 & 27 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.10	0.039	0.47
2 year	2.90	0.22	0.098	1.18
5 year	3.84	0.34	0.159	1.91
10 year	4.62	0.44	0.213	2.56
25 year	5.72	0.58	0.294	3.53
50 year	6.59	0.69	0.359	4.32
100 year	**7.49**	**0.80**	**0.428**	**5.15**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.10	0.08	0.08	**0.00**	337.49	136
2 year	0.22	0.17	0.17	0.00	337.97	400
5 year	0.34	0.24	0.24	0.00	338.62	764
10 year	0.44	0.33	0.33	0.00	339.36	1,121
25 year	0.58	0.57	0.57	0.00	340.03	1,221
50 year	0.69	0.69	0.69	0.00	340.08	1,230
100 year	**0.80**	**0.80**	**0.80**	0.00	**340.12**	**1,236**

DMA 26 & 27 Pre-Development

Summary for Subcatchment 1S: DMA 26 & 27 Pre

Runoff = 0.82 cfs @ 18.14 hrs, Volume= 0.428 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
43,472	80	>75% Grass cover, Good, HSG D
43,472		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 26 & 27 Post-Development

Summary for Subcatchment 2S: DMA 26 & 27 Post

Runoff = 0.80 cfs @ 18.21 hrs, Volume= 0.428 af, Depth= 5.15"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
11,470	98	Roofs, HSG C
32,002	74	>75% Grass cover, Good, HSG C
43,472	80	Weighted Average
32,002		73.62% Pervious Area
11,470		26.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

DMA 26 & 27 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.998 ac, 26.38% Impervious, Inflow Depth = 5.15" for 100 year event
Inflow = 0.80 cfs @ 18.21 hrs, Volume= 0.428 af
Outflow = 0.80 cfs @ 18.22 hrs, Volume= 0.428 af, Atten= 0%, Lag= 0.4 min
Primary = 0.80 cfs @ 18.22 hrs, Volume= 0.428 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.12' @ 18.22 hrs Surf.Area= 1,625 sf Storage= 1,236 cf

Plug-Flow detention time= 45.7 min calculated for 0.428 af (100% of inflow)
Center-of-Mass det. time= 45.5 min (1,019.2 - 973.7)

Volume	Invert	Avail.Storage	Storage Description
#1	337.24'	4,044 cf	**DMA 26 Bio-swale (Prismatic)** Listed below (Recalc)
#2	337.24'	3,643 cf	**DMA 27 Bio-swale (Prismatic)** Listed below (Recalc)
		7,687 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.24	720	0.0	0	0
337.25	720	40.0	3	3
339.24	720	40.0	573	576
339.25	720	10.0	1	577
341.24	1,281	10.0	199	776
341.75	1,860	100.0	801	1,577
342.24	2,457	100.0	1,058	2,634
342.75	3,072	100.0	1,410	4,044

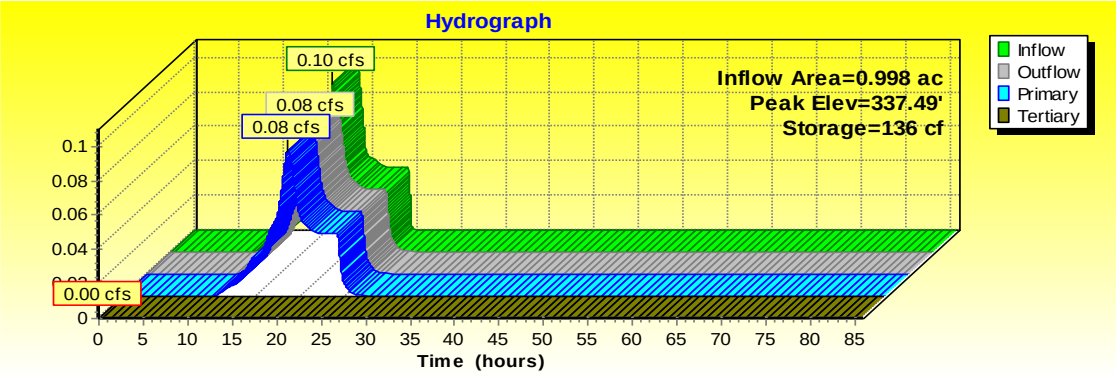
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.24	660	0.0	0	0
337.25	660	40.0	3	3
339.24	660	40.0	525	528
339.25	660	10.0	1	529
341.24	660	10.0	131	660
341.25	1,176	100.0	9	669
341.74	1,710	100.0	707	1,376
342.24	2,262	100.0	993	2,369
342.74	2,832	100.0	1,274	3,643

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.75'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.74'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	337.24'	**2.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	339.24'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.80 cfs @ 18.22 hrs HW=340.12' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.35 cfs @ 8.05 fps)
- **3=Orifice** (Orifice Controls 0.21 cfs @ 4.18 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.24 cfs @ 1.01 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.24' (Free Discharge)

DMA 26 & 27 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

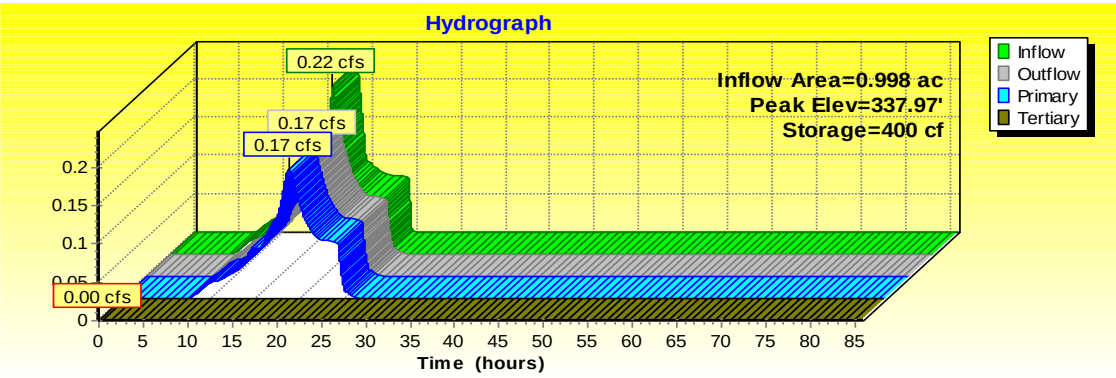
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

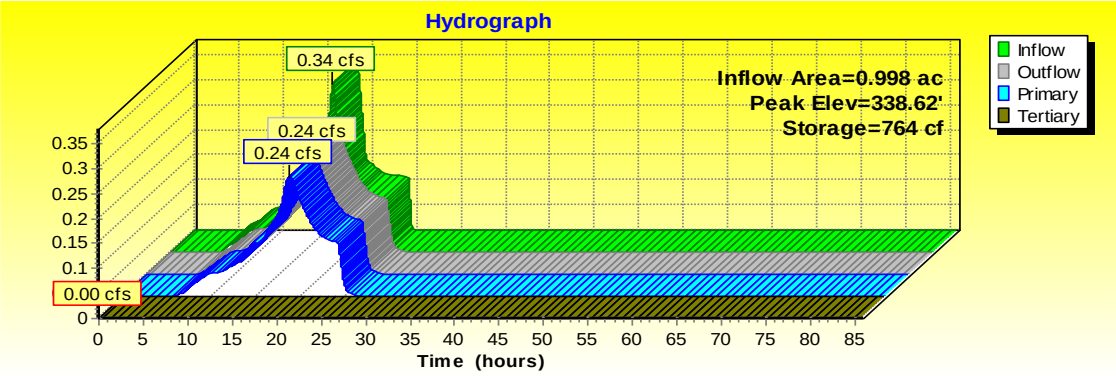
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

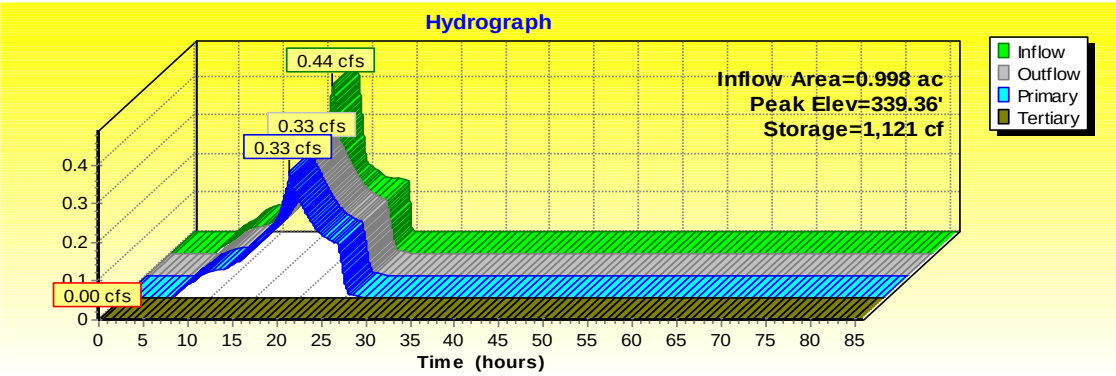
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

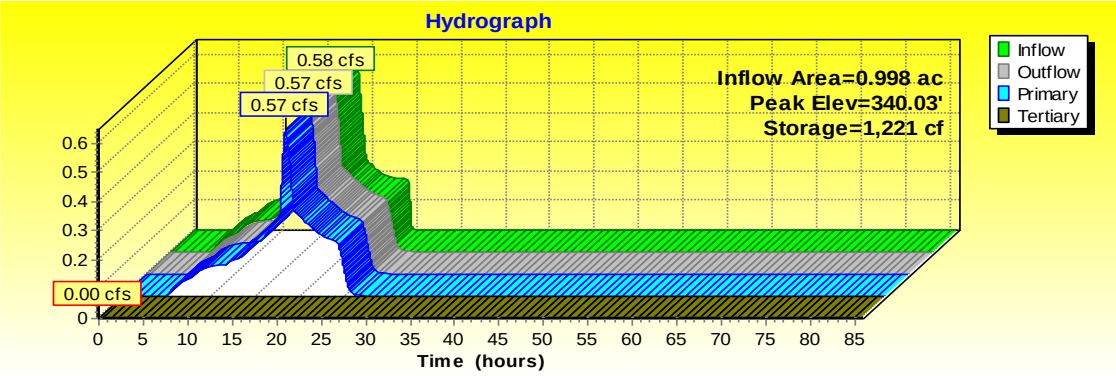
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

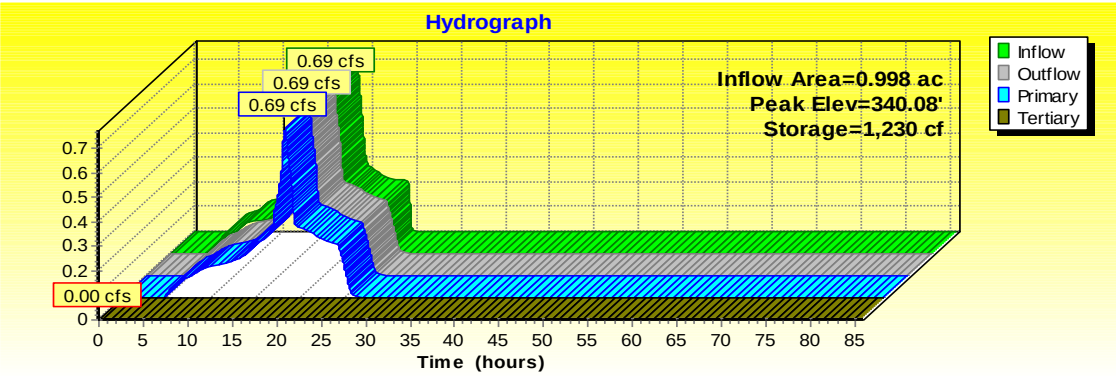
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

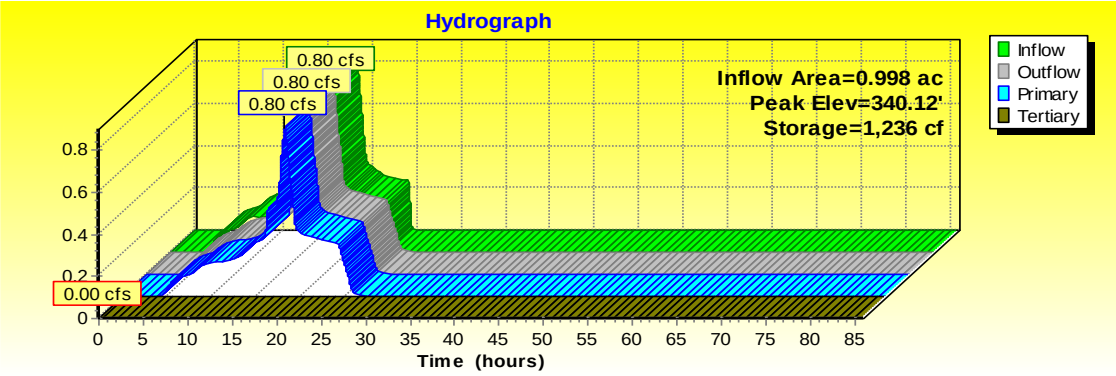
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 26 & 27 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

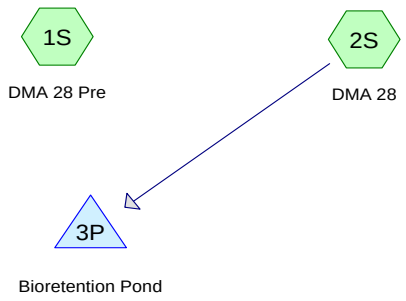
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 Event Summary



Events for Subcatchment 1S: DMA 28 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.11	0.043	0.47
1 year	2.21	0.15	0.062	0.69
2 year	2.90	0.24	0.106	1.18
5 year	3.84	0.37	0.172	1.91
10 year	4.62	0.48	0.230	2.56
25 year	5.72	0.63	0.317	3.53
50 year	6.59	0.76	0.388	4.32
100 year	**7.49**	**0.88**	**0.462**	**5.15**

Events for Subcatchment 2S: DMA 28

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.18	0.081	0.90
1 year	2.21	0.23	0.108	1.20
2 year	2.90	0.32	0.163	1.81
5 year	3.84	0.46	0.240	2.67
10 year	4.62	0.56	0.306	3.41
25 year	5.72	0.72	0.401	4.46
50 year	6.59	0.84	0.477	5.31
100 year	**7.49**	**0.96**	**0.556**	**6.19**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.18	0.09	0.09	**0.00**	336.51	885
1 year	0.23	0.14	0.14	0.00	336.73	1,143
2 year	0.32	0.20	0.20	0.00	337.15	1,623
5 year	0.46	0.27	0.27	0.00	337.91	2,331
10 year	0.56	0.39	0.39	0.00	339.57	2,804
25 year	0.72	0.41	0.41	0.00	340.00	3,644
50 year	0.84	0.63	0.63	0.00	340.11	4,037
100 year	**0.96**	**0.85**	**0.85**	0.00	**340.17**	**4,264**

DMA 28 Pre-Development

Summary for Subcatchment 1S: DMA 28 Pre

Runoff = 0.88 cfs @ 18.14 hrs, Volume= 0.462 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
46,939	80	>75% Grass cover, Good, HSG D
46,939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 28 Post-Development

Summary for Subcatchment 2S: DMA 28

Runoff = 0.96 cfs @ 18.14 hrs, Volume= 0.556 af, Depth= 6.19"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
29,159	98	Roofs, HSG C
17,780	74	>75% Grass cover, Good, HSG C
46,939	89	Weighted Average
17,780		37.88% Pervious Area
29,159		62.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 28 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 1.078 ac, 62.12% Impervious, Inflow Depth = 6.19" for 100 year event
Inflow = 0.96 cfs @ 18.14 hrs, Volume= 0.556 af
Outflow = 0.85 cfs @ 18.39 hrs, Volume= 0.556 af, Atten= 12%, Lag= 14.8 min
Primary = 0.85 cfs @ 18.39 hrs, Volume= 0.556 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.01 hrs
Peak Elev= 340.17' @ 18.39 hrs Surf.Area= 3,643 sf Storage= 4,264 cf

Plug-Flow detention time= 129.1 min calculated for 0.555 af (100% of inflow)
Center-of-Mass det. time= 129.4 min (1,048.0 - 918.7)

Volume	Invert	Avail.Storage	Storage Description
#1	335.73'	12,159 cf	**DMA 28 Bio-swale (Prismatic)** Listed below (Recalc)

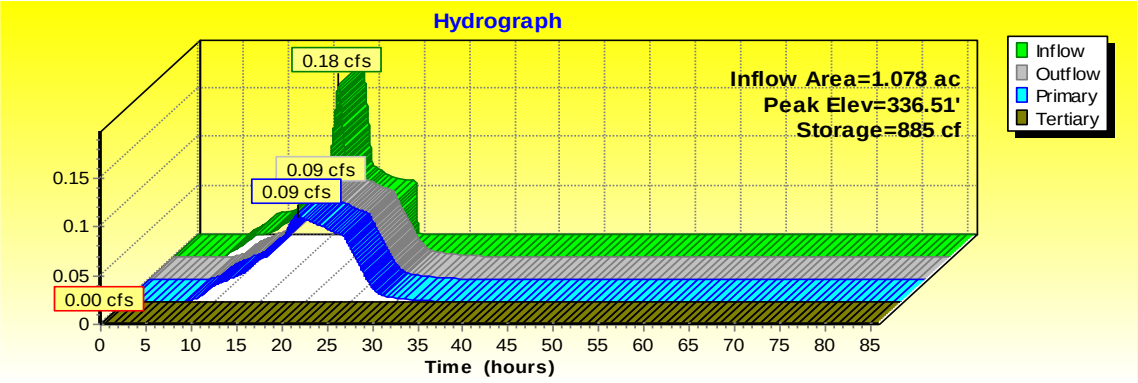
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
335.73	2,850	0.0	0	0
335.74	2,850	40.0	11	11
337.73	2,850	40.0	2,269	2,280
337.74	2,850	10.0	3	2,283
339.73	2,850	10.0	567	2,850
339.74	2,850	10.0	3	2,853
340.23	3,744	100.0	1,616	4,468
340.73	4,656	100.0	2,100	6,568
341.23	5,586	100.0	2,561	9,129
341.73	6,534	100.0	3,030	12,159

Device	Routing	Invert	Outlet Devices
#0	Tertiary	341.73'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	335.73'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.50'	**2.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Primary	340.23'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.85 cfs @ 18.39 hrs HW=340.17' (Free Discharge)
- **1=Orifice** (Orifice Controls 0.22 cfs @ 10.06 fps)
- **2=Orifice** (Orifice Controls 0.20 cfs @ 9.12 fps)
- **3=Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.43 cfs @ 1.22 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=335.73' (Free Discharge)

DMA 28 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

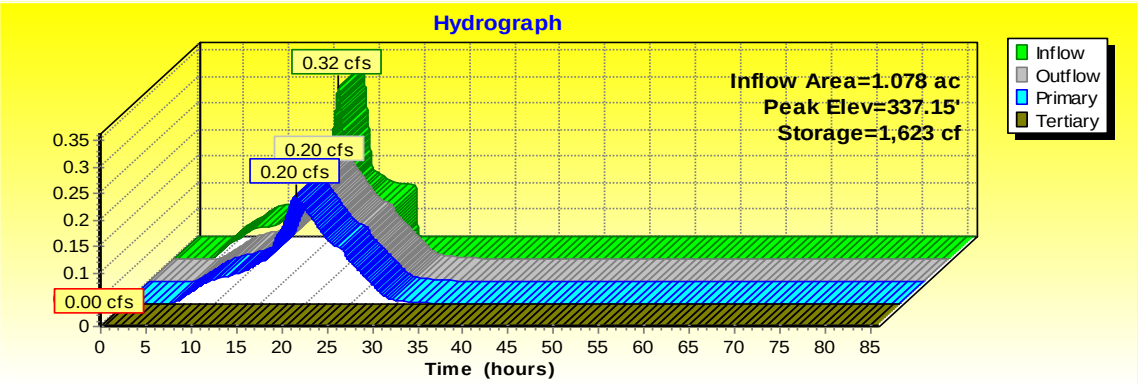
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

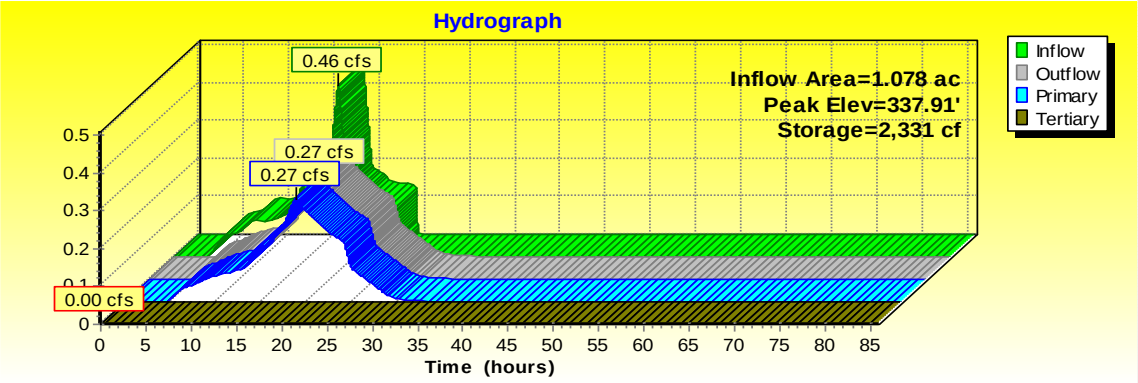
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

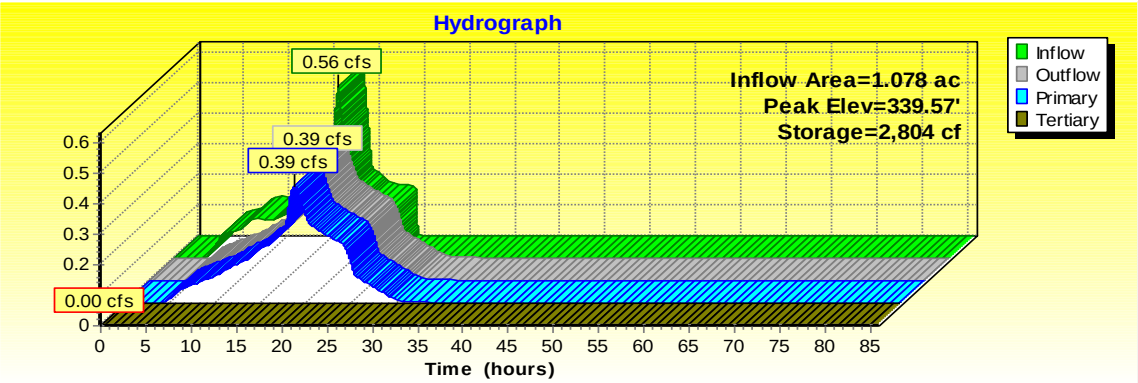
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

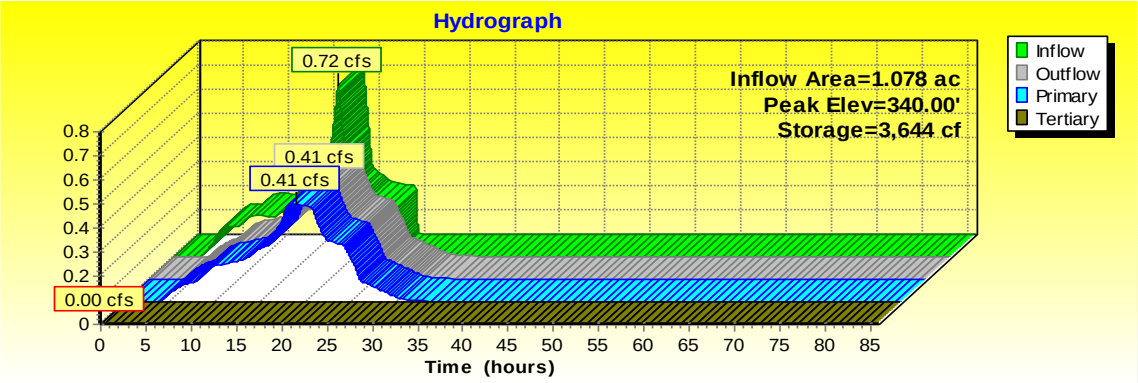
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

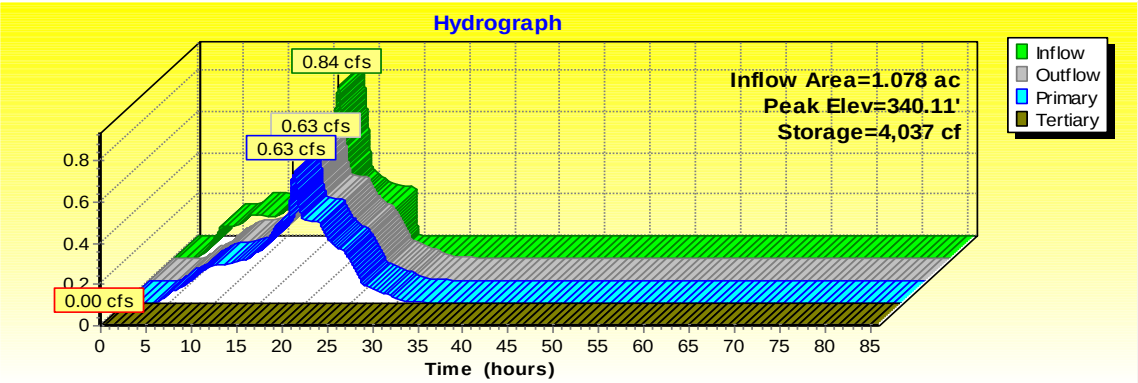
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

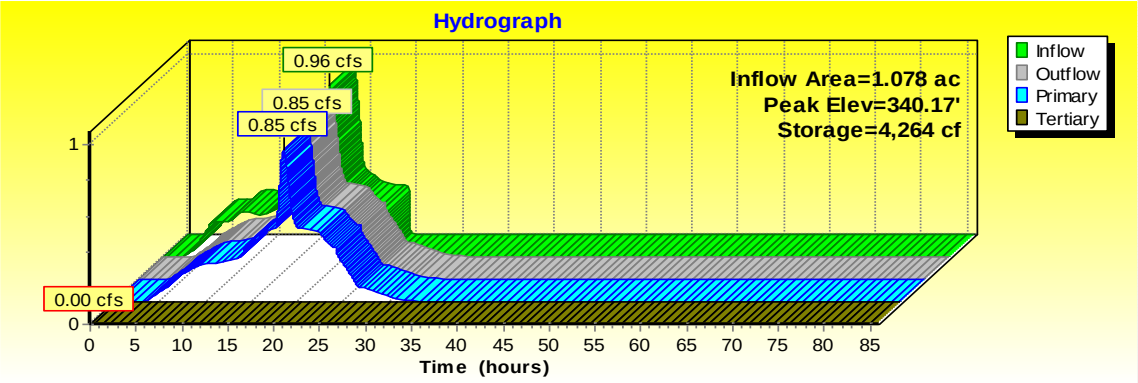
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 28 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

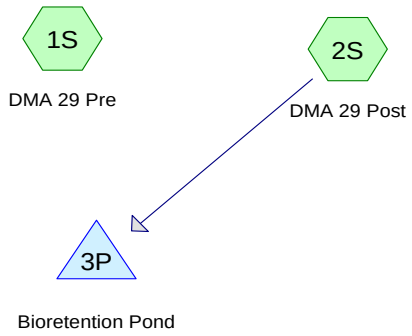
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 Event Summary



Events for Subcatchment 1S: DMA 29 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.03	0.011	0.47
2 year	2.90	0.06	0.026	1.18
5 year	3.84	0.09	0.043	1.91
10 year	4.62	0.12	0.057	2.56
25 year	5.72	0.15	0.079	3.53
50 year	6.59	0.18	0.096	4.32
100 year	**7.49**	**0.21**	**0.115**	**5.15**

Events for Subcatchment 2S: DMA 29 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.019	0.85
2 year	2.90	0.08	0.039	1.73
5 year	3.84	0.11	0.058	2.58
10 year	4.62	0.13	0.074	3.31
25 year	5.72	0.17	0.097	4.36
50 year	6.59	0.20	0.116	5.20
100 year	**7.49**	**0.23**	**0.136**	**6.07**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.04	0.03	0.03	**0.00**	337.06	111
2 year	0.08	0.05	0.05	0.00	337.54	274
5 year	0.11	0.08	0.08	0.00	337.84	377
10 year	0.13	0.10	0.10	0.00	338.09	463
25 year	0.17	0.12	0.12	0.00	338.50	600
50 year	0.20	0.15	0.15	0.00	339.10	714
100 year	**0.23**	**0.20**	**0.20**	0.00	**340.03**	**793**

DMA 29 Pre-Development

Summary for Subcatchment 1S: DMA 29 Pre

Runoff = 0.21 cfs @ 18.27 hrs, Volume= 0.115 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
11,674	80	>75% Grass cover, Good, HSG D
11,674		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 29 Post-Development

Summary for Subcatchment 2S: DMA 29 Post

Runoff = 0.23 cfs @ 18.27 hrs, Volume= 0.136 af, Depth= 6.07"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	7,045	98	Roofs
*	4,629	74	>75% Grass cover, Good, HSG C
	11,674	88	Weighted Average
	4,629		39.65% Pervious Area
	7,045		60.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 29 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.268 ac, 60.35% Impervious, Inflow Depth = 6.07" for 100 year event
Inflow = 0.23 cfs @ 18.27 hrs, Volume= 0.136 af
Outflow = 0.20 cfs @ 18.62 hrs, Volume= 0.136 af, Atten= 13%, Lag= 21.3 min
Primary = 0.20 cfs @ 18.62 hrs, Volume= 0.136 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 340.03' @ 18.64 hrs Surf.Area= 850 sf Storage= 793 cf

Plug-Flow detention time= 80.7 min calculated for 0.136 af (100% of inflow)
Center-of-Mass det. time= 78.9 min (1,012.9 - 934.0)

Volume	Invert	Avail.Storage	Storage Description
#1	336.73'	4,249 cf	**DMA 29 Bioswale (Prismatic)** Listed below (Recalc)

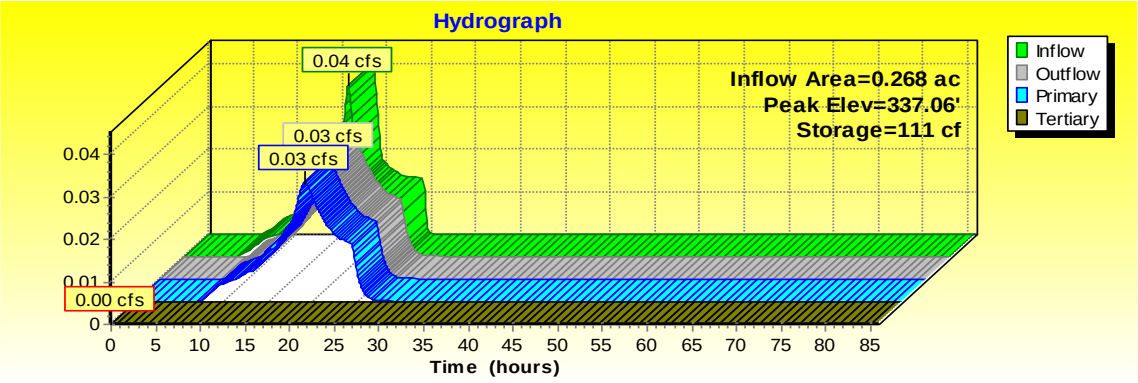
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.73	850	0.0	0	0
336.74	850	40.0	3	3
338.73	850	40.0	677	680
338.74	850	40.0	3	683
340.73	850	10.0	169	853
340.74	850	10.0	1	853
341.23	1,384	10.0	55	908
341.73	1,936	100.0	830	1,738
342.23	2,506	100.0	1,111	2,849
342.73	3,094	100.0	1,400	4,249

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.73'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.23'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.73'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.50'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.19 cfs @ 18.62 hrs HW=340.02' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.09 cfs @ 8.68 fps)
- **3=Orifice** (Orifice Controls 0.08 cfs @ 7.58 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.40 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.73' (Free Discharge)

DMA 29 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

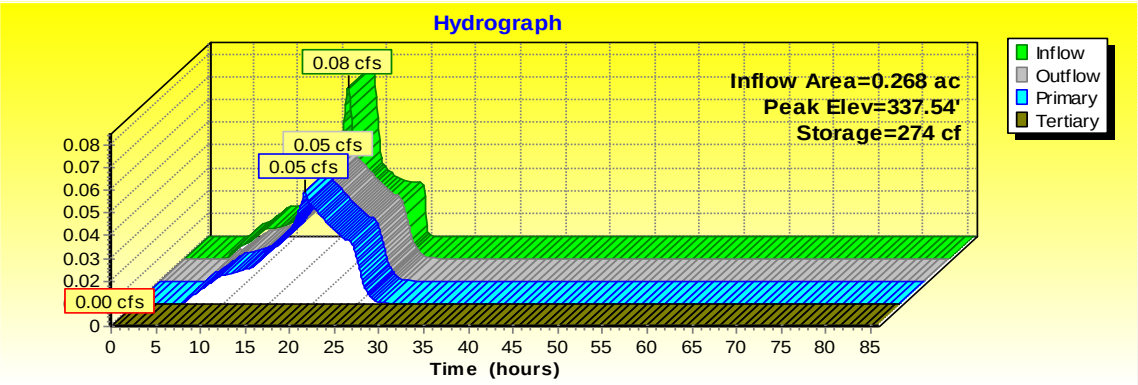
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

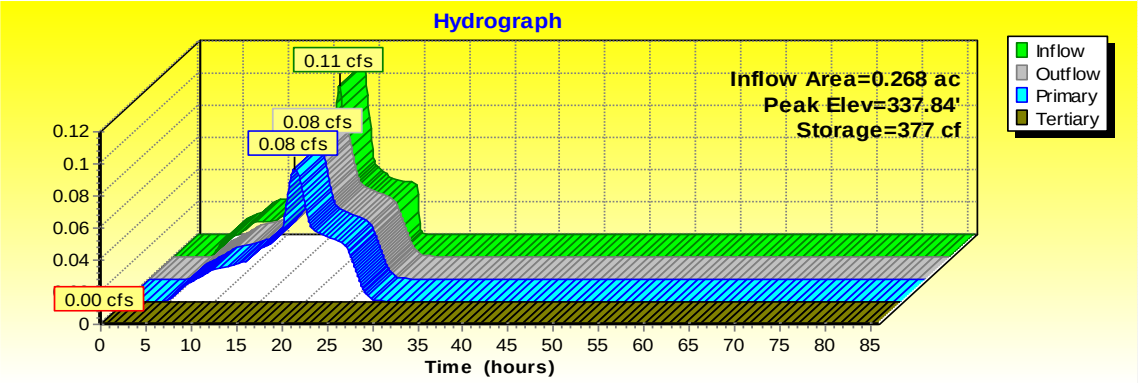
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

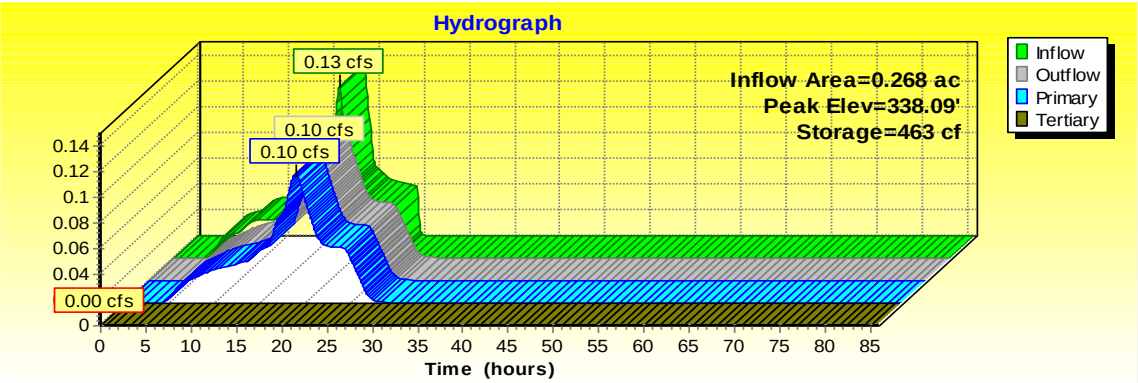
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

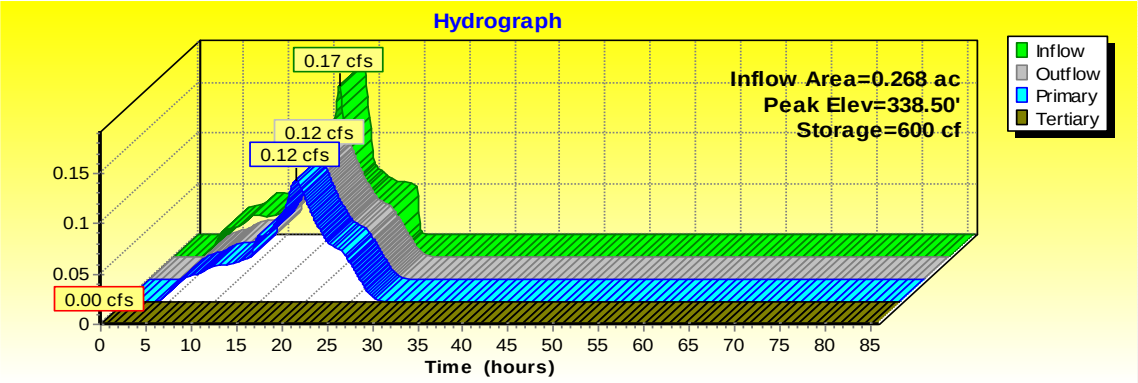
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

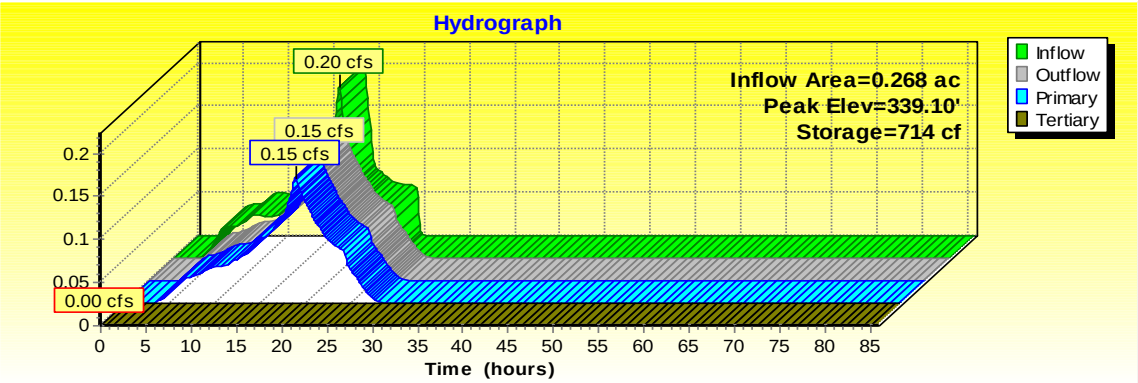
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

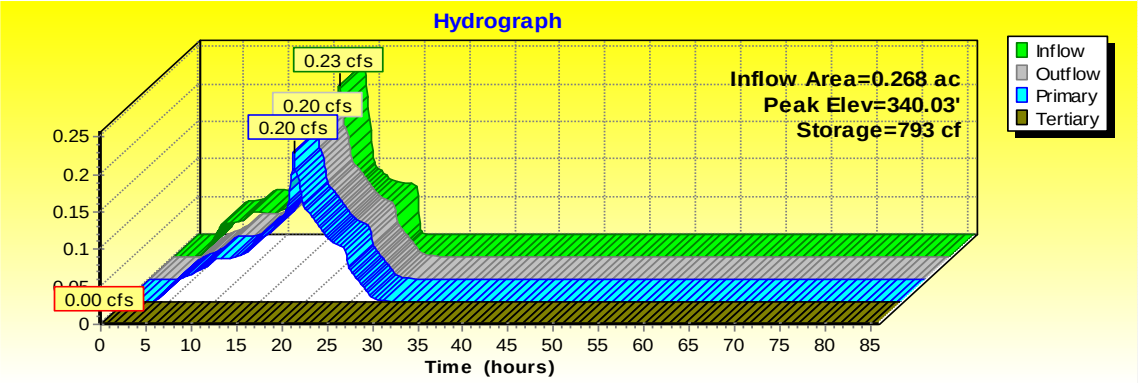
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 29 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

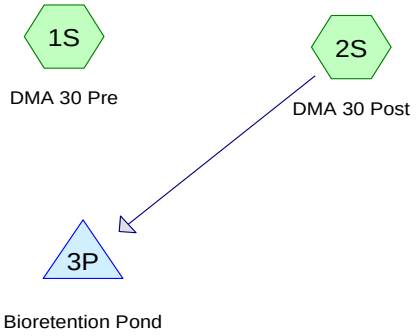
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 Event Summary



Events for Subcatchment 1S: DMA 30 Pre

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.03	0.012	0.47
2 year	2.90	0.06	0.029	1.18
5 year	3.84	0.10	0.047	1.91
10 year	4.62	0.13	0.063	2.56
25 year	5.72	0.17	0.087	3.53
50 year	6.59	0.20	0.106	4.32
100 year	**7.49**	**0.23**	**0.127**	**5.15**

Events for Subcatchment 2S: DMA 30 Post

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	0.04	0.021	0.85
2 year	2.90	0.08	0.043	1.73
5 year	3.84	0.12	0.064	2.58
10 year	4.62	0.15	0.081	3.31
25 year	5.72	0.19	0.107	4.36
50 year	6.59	0.22	0.128	5.20
100 year	**7.49**	**0.25**	**0.149**	**6.07**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	0.05	0.03	0.03	**0.00**	336.97	98
2 year	0.09	0.06	0.06	0.00	337.32	231
5 year	0.12	0.10	0.10	0.00	337.63	351
10 year	0.15	0.12	0.12	0.00	337.82	423
25 year	0.19	0.15	0.15	0.00	338.10	527
50 year	0.23	0.17	0.17	0.00	338.34	621
100 year	**0.26**	**0.19**	**0.19**	0.00	**338.63**	**728**

DMA 30 Pre-Development

Summary for Subcatchment 1S: DMA 30 Pre

Runoff = 0.23 cfs @ 18.27 hrs, Volume= 0.127 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
12,866	80	>75% Grass cover, Good, HSG D
12,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 30 Post-Development

Summary for Subcatchment 2S: DMA 30 Post

Runoff = 0.25 cfs @ 18.27 hrs, Volume= 0.149 af, Depth= 6.07"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

	Area (sf)	CN	Description
*	7,600	98	Roofs
*	5,266	74	>75% Grass cover, Good, HSG C
	12,866	88	Weighted Average
	5,266		40.93% Pervious Area
	7,600		59.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

DMA 30 Post-Development Routed Through Storm Water Control

Summary for Pond 3P: Bioretention Pond

Inflow Area = 0.295 ac, 59.07% Impervious, Inflow Depth = 6.07" for 100 year event
Inflow = 0.26 cfs @ 18.13 hrs, Volume= 0.149 af
Outflow = 0.19 cfs @ 18.64 hrs, Volume= 0.149 af, Atten= 27%, Lag= 30.4 min
Primary = 0.19 cfs @ 18.64 hrs, Volume= 0.149 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-86.00 hrs, dt= 0.10 hrs
Peak Elev= 338.63' @ 18.64 hrs Surf.Area= 950 sf Storage= 728 cf

Plug-Flow detention time= 62.2 min calculated for 0.149 af (100% of inflow)
Center-of-Mass det. time= 61.0 min (985.7 - 924.8)

Volume	Invert	Avail.Storage	Storage Description
#1	336.71'	4,213 cf	**DMA 29 Bioswale (Prismatic)** Listed below (Recalc)

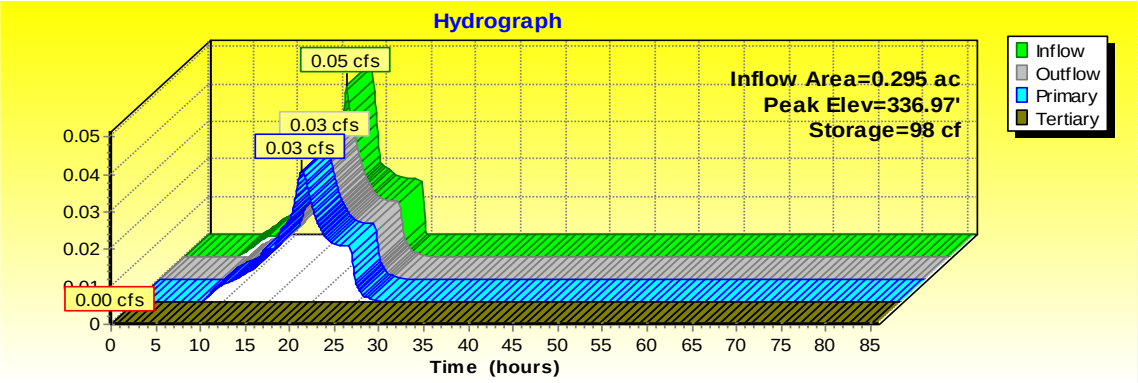
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
336.71	950	0.0	0	0
336.72	950	40.0	4	4
338.71	950	40.0	756	760
338.72	950	40.0	4	764
340.71	950	10.0	189	953
340.72	950	10.0	1	954
341.22	1,274	100.0	556	1,510
341.72	1,616	100.0	723	2,232
342.22	1,976	100.0	898	3,130
342.72	2,354	100.0	1,083	4,213

Device	Routing	Invert	Outlet Devices
#0	Tertiary	342.72'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	341.21'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	336.73'	**1.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	337.50'	**1.0" Vert. Orifice X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	340.00'	**2.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.19 cfs @ 18.64 hrs HW=338.62' (Free Discharge)
- **1=Grate** (Controls 0.00 cfs)
- **2=Orifice** (Orifice Controls 0.11 cfs @ 6.55 fps)
- **3=Orifice** (Orifice Controls 0.08 cfs @ 5.01 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=336.71' (Free Discharge)

DMA 30 95th% Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

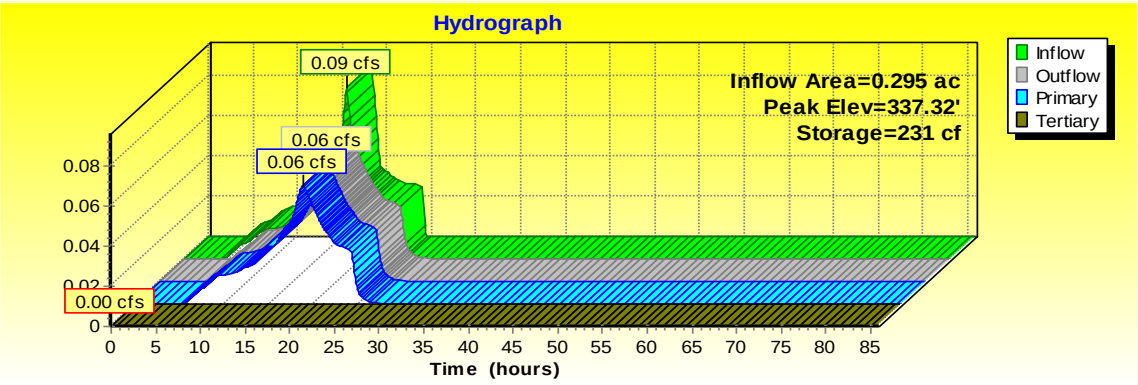
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

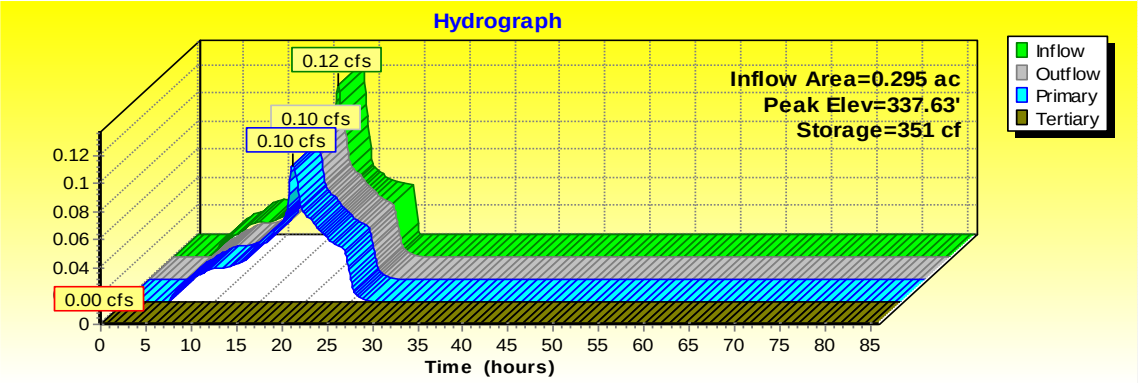
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

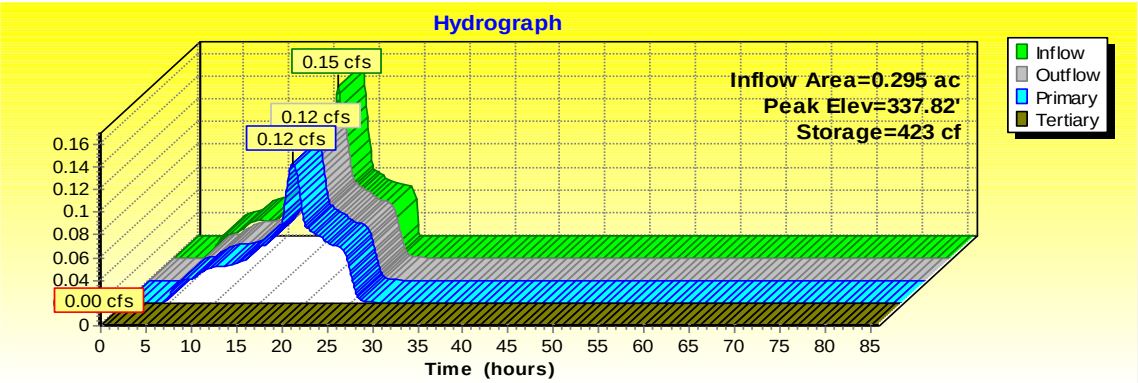
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

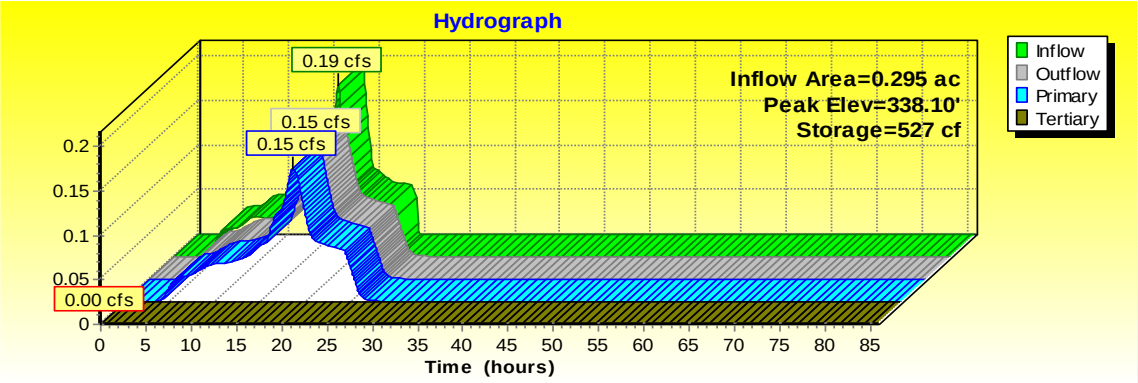
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

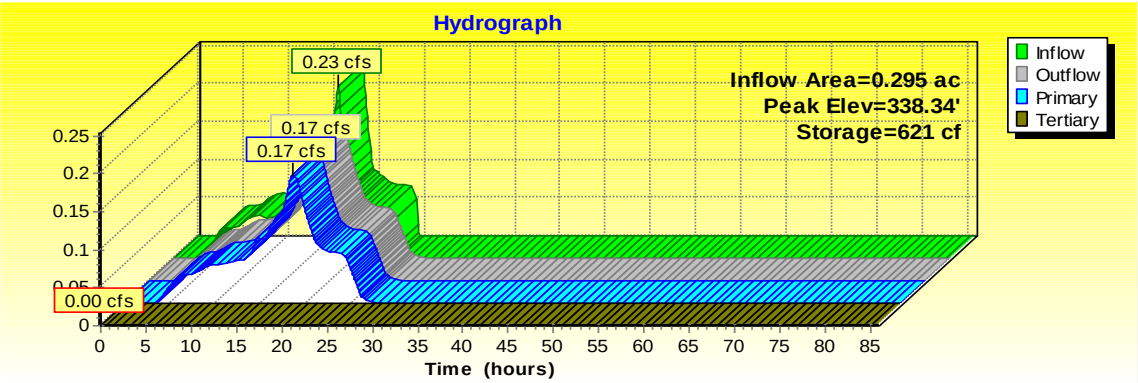
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

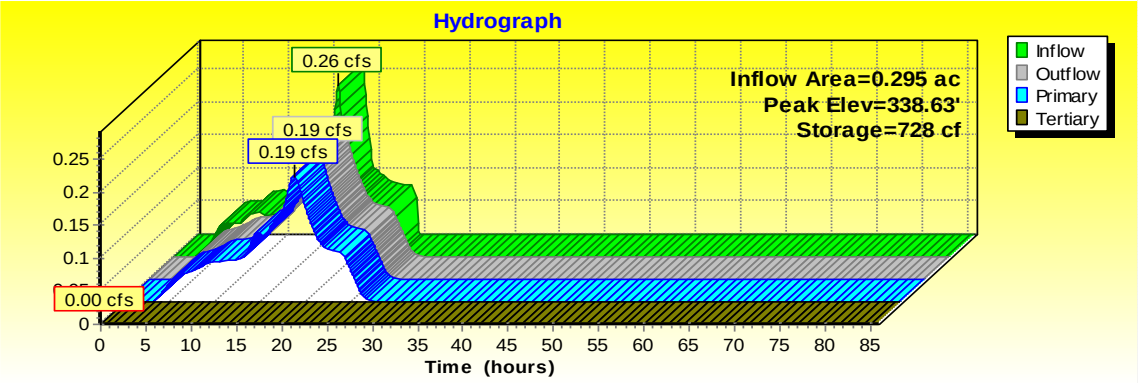
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

DMA 30 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via Water Quality Control Outlet

Tertiary = flow out via over the back bio-pond (occurs when water surface elevation exceeds top of bank)

MH engineering Co.
16075 Vineyard Blvd., Morgan Hill, CA 95037 - (408) 779-7381

Project: Black Rock-Quail Vineyard
Project No.: 25268.2
Date: 5/22/2023

DMA No. 1 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.83	0.00	0.00	**0.00**
2.00	0.00	0	335.83	0.00	0.00	0.00
4.00	0.00	0	335.83	0.00	0.00	0.00
6.00	0.00	0	335.83	0.00	0.00	0.00
8.00	0.01	18	335.85	0.00	0.00	0.00
10.00	0.02	52	335.88	0.01	0.01	0.00
12.00	0.02	75	335.91	0.02	0.02	0.00
14.00	0.04	120	335.96	0.03	0.03	0.00
16.00	0.06	195	336.03	0.04	0.04	0.00
18.00	**0.13**	**410**	**336.26**	**0.07**	**0.07**	0.00
20.00	**0.06**	**528**	**336.38**	**0.08**	**0.08**	0.00
22.00	0.05	399	336.25	0.06	0.06	0.00
24.00	0.05	312	336.16	0.06	0.06	0.00
26.00	0.00	71	335.90	0.02	0.02	0.00
28.00	0.00	16	335.85	0.00	0.00	0.00
30.00	0.00	9	335.84	0.00	0.00	0.00
32.00	0.00	6	335.84	0.00	0.00	0.00
34.00	0.00	4	335.83	0.00	0.00	0.00
36.00	0.00	3	335.83	0.00	0.00	0.00
38.00	0.00	2	335.83	0.00	0.00	0.00
40.00	0.00	1	335.83	0.00	0.00	0.00
42.00	0.00	1	335.83	0.00	0.00	0.00
44.00	0.00	1	335.83	0.00	0.00	0.00
46.00	0.00	0	335.83	0.00	0.00	0.00
48.00	0.00	0	335.83	0.00	0.00	0.00
50.00	0.00	0	335.83	0.00	0.00	0.00
52.00	0.00	0	335.83	0.00	0.00	0.00
54.00	0.00	0	335.83	0.00	0.00	0.00
56.00	0.00	0	335.83	0.00	0.00	0.00
58.00	0.00	0	335.83	0.00	0.00	0.00
60.00	0.00	0	335.83	0.00	0.00	0.00
62.00	0.00	0	335.83	0.00	0.00	0.00
64.00	0.00	0	335.83	0.00	0.00	0.00
66.00	0.00	0	335.83	0.00	0.00	0.00
68.00	0.00	0	335.83	0.00	0.00	0.00
70.00	0.00	0	335.83	0.00	0.00	0.00
72.00	0.00	0	335.83	0.00	0.00	0.00
74.00	0.00	0	335.83	0.00	0.00	0.00
76.00	0.00	0	335.83	0.00	0.00	0.00
78.00	0.00	0	335.83	0.00	0.00	0.00
80.00	0.00	0	335.83	0.00	0.00	0.00
82.00	0.00	0	335.83	0.00	0.00	0.00
84.00	0.00	0	335.83	0.00	0.00	0.00
86.00	0.00	0	335.83	0.00	0.00	0.00
88.00	0.00	0	335.83	0.00	0.00	0.00
90.00	0.00	0	335.83	0.00	0.00	0.00
92.00	0.00	0	335.83	0.00	0.00	0.00
94.00	0.00	0	335.83	0.00	0.00	0.00
96.00	0.00	0	335.83	0.00	0.00	0.00

##

DMA No. 1 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.83	0.00	0.00	**0.00**
2.00	0.00	0	335.83	0.00	0.00	0.00
4.00	0.06	82	335.92	0.02	0.02	0.00
6.00	0.16	584	336.44	0.08	0.08	0.00
8.00	0.19	1,092	336.97	0.11	0.11	0.00
10.00	0.21	1,711	337.62	0.14	0.14	0.00
12.00	0.23	2,110	338.68	0.18	0.18	0.00
14.00	0.35	2,395	339.83	0.29	0.29	0.00
16.00	0.43	2,596	339.92	0.35	0.35	0.00
18.00	**0.79**	**3,119**	**340.14**	**0.68**	**0.68**	0.00
20.00	**0.31**	**2,667**	**339.95**	**0.38**	**0.38**	0.00
22.00	0.26	2,373	339.78	0.28	0.28	0.00
24.00	0.24	2,305	339.50	0.25	0.25	0.00
26.00	0.00	1,356	337.25	0.12	0.12	0.00
28.00	0.00	618	336.48	0.08	0.08	0.00
30.00	0.00	179	336.02	0.04	0.04	0.00
32.00	0.00	31	335.86	0.01	0.01	0.00
34.00	0.00	11	335.84	0.00	0.00	0.00
36.00	0.00	7	335.84	0.00	0.00	0.00
38.00	0.00	5	335.84	0.00	0.00	0.00
40.00	0.00	3	335.83	0.00	0.00	0.00
42.00	0.00	2	335.83	0.00	0.00	0.00
44.00	0.00	2	335.83	0.00	0.00	0.00
46.00	0.00	1	335.83	0.00	0.00	0.00
48.00	0.00	1	335.83	0.00	0.00	0.00
50.00	0.00	0	335.83	0.00	0.00	0.00
52.00	0.00	0	335.83	0.00	0.00	0.00
54.00	0.00	0	335.83	0.00	0.00	0.00
56.00	0.00	0	335.83	0.00	0.00	0.00
58.00	0.00	0	335.83	0.00	0.00	0.00
60.00	0.00	0	335.83	0.00	0.00	0.00
62.00	0.00	0	335.83	0.00	0.00	0.00
64.00	0.00	0	335.83	0.00	0.00	0.00
66.00	0.00	0	335.83	0.00	0.00	0.00
68.00	0.00	0	335.83	0.00	0.00	0.00
70.00	0.00	0	335.83	0.00	0.00	0.00
72.00	0.00	0	335.83	0.00	0.00	0.00
74.00	0.00	0	335.83	0.00	0.00	0.00
76.00	0.00	0	335.83	0.00	0.00	0.00
78.00	0.00	0	335.83	0.00	0.00	0.00
80.00	0.00	0	335.83	0.00	0.00	0.00
82.00	0.00	0	335.83	0.00	0.00	0.00
84.00	0.00	0	335.83	0.00	0.00	0.00
86.00	0.00	0	335.83	0.00	0.00	0.00
88.00	0.00	0	335.83	0.00	0.00	0.00
90.00	0.00	0	335.83	0.00	0.00	0.00
92.00	0.00	0	335.83	0.00	0.00	0.00
94.00	0.00	0	335.83	0.00	0.00	0.00
96.00	0.00	0	335.83	0.00	0.00	0.00

DMA No. 2 & 3 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.52	0.00	0.00	**0.00**
2.00	0.00	0	336.52	0.00	0.00	0.00
4.00	0.00	0	336.52	0.00	0.00	0.00
6.00	0.00	0	336.52	0.00	0.00	0.00
8.00	0.00	0	336.52	0.00	0.00	0.00
10.00	0.00	2	336.52	0.00	0.00	0.00
12.00	0.01	17	336.55	0.01	0.01	0.00
14.00	0.02	36	336.58	0.02	0.02	0.00
16.00	0.04	49	336.61	0.03	0.03	0.00
18.00	**0.09**	**84**	**336.67**	**0.08**	**0.08**	0.00
20.00	**0.04**	**59**	**336.62**	**0.04**	**0.04**	0.00
22.00	0.04	53	336.62	0.04	0.04	0.00
24.00	0.04	53	336.61	0.04	0.04	0.00
26.00	0.00	6	336.53	0.00	0.00	0.00
28.00	0.00	3	336.53	0.00	0.00	0.00
30.00	0.00	2	336.52	0.00	0.00	0.00
32.00	0.00	1	336.52	0.00	0.00	0.00
34.00	0.00	1	336.52	0.00	0.00	0.00
36.00	0.00	0	336.52	0.00	0.00	0.00
38.00	0.00	0	336.52	0.00	0.00	0.00
40.00	0.00	0	336.52	0.00	0.00	0.00
42.00	0.00	0	336.52	0.00	0.00	0.00
44.00	0.00	0	336.52	0.00	0.00	0.00
46.00	0.00	0	336.52	0.00	0.00	0.00
48.00	0.00	0	336.52	0.00	0.00	0.00
50.00	0.00	0	336.52	0.00	0.00	0.00
52.00	0.00	0	336.52	0.00	0.00	0.00
54.00	0.00	0	336.52	0.00	0.00	0.00
56.00	0.00	0	336.52	0.00	0.00	0.00
58.00	0.00	0	336.52	0.00	0.00	0.00
60.00	0.00	0	336.52	0.00	0.00	0.00
62.00	0.00	0	336.52	0.00	0.00	0.00
64.00	0.00	0	336.52	0.00	0.00	0.00
66.00	0.00	0	336.52	0.00	0.00	0.00
68.00	0.00	0	336.52	0.00	0.00	0.00
70.00	0.00	0	336.52	0.00	0.00	0.00
72.00	0.00	0	336.52	0.00	0.00	0.00
74.00	0.00	0	336.52	0.00	0.00	0.00
76.00	0.00	0	336.52	0.00	0.00	0.00
78.00	0.00	0	336.52	0.00	0.00	0.00
80.00	0.00	0	336.52	0.00	0.00	0.00
82.00	0.00	0	336.52	0.00	0.00	0.00
84.00	0.00	0	336.52	0.00	0.00	0.00
86.00	0.00	0	336.52	0.00	0.00	0.00
88.00	0.00	0	336.52	0.00	0.00	0.00
90.00	0.00	0	336.52	0.00	0.00	0.00
92.00	0.00	0	336.52	0.00	0.00	0.00
94.00	0.00	0	336.52	0.00	0.00	0.00
96.00	0.00	0	336.52	0.00	0.00	0.00
98.00	0.00	0	336.52	0.00	0.00	0.00
100.00	0.00	0	336.52	0.00	0.00	0.00

DMA No. 2 & 3 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.52	0.00	0.00	**0.00**
2.00	0.00	0	336.52	0.00	0.00	0.00
4.00	0.01	2	336.52	0.00	0.00	0.00
6.00	0.10	94	336.69	0.10	0.10	0.00
8.00	0.15	122	336.74	0.14	0.14	0.00
10.00	0.17	149	336.79	0.18	0.18	0.00
12.00	0.20	166	336.82	0.20	0.20	0.00
14.00	0.33	273	337.01	0.28	0.28	0.00
16.00	0.41	378	337.19	0.35	0.35	0.00
18.00	**0.78**	**860**	**338.06**	**0.67**	**0.67**	0.00
20.00	**0.32**	**421**	**337.27**	**0.37**	**0.37**	0.00
22.00	0.26	250	336.97	0.27	0.27	0.00
24.00	0.25	228	336.93	0.25	0.25	0.00
26.00	0.00	8	336.53	0.00	0.00	0.00
28.00	0.00	4	336.53	0.00	0.00	0.00
30.00	0.00	2	336.52	0.00	0.00	0.00
32.00	0.00	1	336.52	0.00	0.00	0.00
34.00	0.00	1	336.52	0.00	0.00	0.00
36.00	0.00	0	336.52	0.00	0.00	0.00
38.00	0.00	0	336.52	0.00	0.00	0.00
40.00	0.00	0	336.52	0.00	0.00	0.00
42.00	0.00	0	336.52	0.00	0.00	0.00
44.00	0.00	0	336.52	0.00	0.00	0.00
46.00	0.00	0	336.52	0.00	0.00	0.00
48.00	0.00	0	336.52	0.00	0.00	0.00
50.00	0.00	0	336.52	0.00	0.00	0.00
52.00	0.00	0	336.52	0.00	0.00	0.00
54.00	0.00	0	336.52	0.00	0.00	0.00
56.00	0.00	0	336.52	0.00	0.00	0.00
58.00	0.00	0	336.52	0.00	0.00	0.00
60.00	0.00	0	336.52	0.00	0.00	0.00
62.00	0.00	0	336.52	0.00	0.00	0.00
64.00	0.00	0	336.52	0.00	0.00	0.00
66.00	0.00	0	336.52	0.00	0.00	0.00
68.00	0.00	0	336.52	0.00	0.00	0.00
70.00	0.00	0	336.52	0.00	0.00	0.00
72.00	0.00	0	336.52	0.00	0.00	0.00
74.00	0.00	0	336.52	0.00	0.00	0.00
76.00	0.00	0	336.52	0.00	0.00	0.00
78.00	0.00	0	336.52	0.00	0.00	0.00
80.00	0.00	0	336.52	0.00	0.00	0.00
82.00	0.00	0	336.52	0.00	0.00	0.00
84.00	0.00	0	336.52	0.00	0.00	0.00
86.00	0.00	0	336.52	0.00	0.00	0.00
88.00	0.00	0	336.52	0.00	0.00	0.00
90.00	0.00	0	336.52	0.00	0.00	0.00
92.00	0.00	0	336.52	0.00	0.00	0.00
94.00	0.00	0	336.52	0.00	0.00	0.00
96.00	0.00	0	336.52	0.00	0.00	0.00
98.00	0.00	0	336.52	0.00	0.00	0.00
100.00	0.00	0	336.52	0.00	0.00	0.00

DMA No. 4 & 5 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.67	0.00	0.00	**0.00**
5.00	0.00	0	336.67	0.00	0.00	0.00
10.00	0.00	2	336.67	0.00	0.00	0.00
15.00	**0.02**	**45**	**336.75**	**0.02**	**0.02**	0.00
20.00	**0.04**	**70**	**336.80**	**0.04**	**0.04**	0.00
25.00	0.00	21	336.71	0.01	0.01	0.00
30.00	0.00	3	336.67	0.00	0.00	0.00
35.00	0.00	1	336.67	0.00	0.00	0.00
40.00	0.00	0	336.67	0.00	0.00	0.00
45.00	0.00	0	336.67	0.00	0.00	0.00
50.00	0.00	0	336.67	0.00	0.00	0.00
55.00	0.00	0	336.67	0.00	0.00	0.00
60.00	0.00	0	336.67	0.00	0.00	0.00
65.00	0.00	0	336.67	0.00	0.00	0.00
70.00	0.00	0	336.67	0.00	0.00	0.00
75.00	0.00	0	336.67	0.00	0.00	0.00
80.00	0.00	0	336.67	0.00	0.00	0.00
85.00	0.00	0	336.67	0.00	0.00	0.00
90.00	0.00	0	336.67	0.00	0.00	0.00
95.00	0.00	0	336.67	0.00	0.00	0.00
100.00	0.00	0	336.67	0.00	0.00	0.00
105.00	0.00	0	336.67	0.00	0.00	0.00
110.00	0.00	0	336.67	0.00	0.00	0.00
115.00	0.00	0	336.67	0.00	0.00	0.00
120.00	0.00	0	336.67	0.00	0.00	0.00
125.00	0.00	0	336.67	0.00	0.00	0.00

DMA No. 4 & 5 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.67	0.00	0.00	**0.00**
5.00	0.06	63	336.78	0.04	0.04	0.00
10.00	0.16	337	337.28	0.15	0.15	0.00
15.00	**0.27**	**835**	**338.18**	**0.25**	**0.25**	0.00
20.00	**0.28**	**1,116**	**338.76**	**0.30**	**0.30**	0.00
25.00	0.00	252	337.13	0.13	0.13	0.00
30.00	0.00	4	336.68	0.00	0.00	0.00
35.00	0.00	1	336.67	0.00	0.00	0.00
40.00	0.00	0	336.67	0.00	0.00	0.00
45.00	0.00	0	336.67	0.00	0.00	0.00
50.00	0.00	0	336.67	0.00	0.00	0.00
55.00	0.00	0	336.67	0.00	0.00	0.00
60.00	0.00	0	336.67	0.00	0.00	0.00
65.00	0.00	0	336.67	0.00	0.00	0.00
70.00	0.00	0	336.67	0.00	0.00	0.00
75.00	0.00	0	336.67	0.00	0.00	0.00
80.00	0.00	0	336.67	0.00	0.00	0.00
85.00	0.00	0	336.67	0.00	0.00	0.00
90.00	0.00	0	336.67	0.00	0.00	0.00
95.00	0.00	0	336.67	0.00	0.00	0.00
100.00	0.00	0	336.67	0.00	0.00	0.00
105.00	0.00	0	336.67	0.00	0.00	0.00
110.00	0.00	0	336.67	0.00	0.00	0.00
115.00	0.00	0	336.67	0.00	0.00	0.00
120.00	0.00	0	336.67	0.00	0.00	0.00
125.00	0.00	0	336.67	0.00	0.00	0.00

DMA No. 6 & 7 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.00	0	336.10	0.00	0.00	0.00
6.00	0.00	0	336.10	0.00	0.00	0.00
8.00	0.00	0	336.10	0.00	0.00	0.00
10.00	0.00	1	336.10	0.00	0.00	0.00
12.00	0.01	14	336.13	0.01	0.01	0.00
14.00	0.02	28	336.16	0.01	0.01	0.00
16.00	0.03	40	336.18	0.03	0.03	0.00
18.00	**0.08**	**68**	**336.23**	**0.07**	**0.07**	0.00
20.00	**0.04**	**49**	**336.20**	**0.04**	**0.04**	0.00
22.00	0.03	45	336.19	0.03	0.03	0.00
24.00	0.03	45	336.19	0.03	0.03	0.00
26.00	0.00	6	336.11	0.00	0.00	0.00
28.00	0.00	3	336.11	0.00	0.00	0.00
30.00	0.00	2	336.10	0.00	0.00	0.00
32.00	0.00	1	336.10	0.00	0.00	0.00
34.00	0.00	0	336.10	0.00	0.00	0.00
36.00	0.00	0	336.10	0.00	0.00	0.00
38.00	0.00	0	336.10	0.00	0.00	0.00
40.00	0.00	0	336.10	0.00	0.00	0.00
42.00	0.00	0	336.10	0.00	0.00	0.00
44.00	0.00	0	336.10	0.00	0.00	0.00
46.00	0.00	0	336.10	0.00	0.00	0.00
48.00	0.00	0	336.10	0.00	0.00	0.00
50.00	0.00	0	336.10	0.00	0.00	0.00
52.00	0.00	0	336.10	0.00	0.00	0.00
54.00	0.00	0	336.10	0.00	0.00	0.00
56.00	0.00	0	336.10	0.00	0.00	0.00
58.00	0.00	0	336.10	0.00	0.00	0.00
60.00	0.00	0	336.10	0.00	0.00	0.00
62.00	0.00	0	336.10	0.00	0.00	0.00
64.00	0.00	0	336.10	0.00	0.00	0.00
66.00	0.00	0	336.10	0.00	0.00	0.00
68.00	0.00	0	336.10	0.00	0.00	0.00
70.00	0.00	0	336.10	0.00	0.00	0.00
72.00	0.00	0	336.10	0.00	0.00	0.00
74.00	0.00	0	336.10	0.00	0.00	0.00
76.00	0.00	0	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 6 & 7 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.00	1	336.10	0.00	0.00	0.00
6.00	0.09	78	336.25	0.08	0.08	0.00
8.00	0.13	99	336.29	0.12	0.12	0.00
10.00	0.15	118	336.33	0.15	0.15	0.00
12.00	0.17	128	336.35	0.17	0.17	0.00
14.00	0.27	201	336.49	0.24	0.24	0.00
16.00	0.34	271	336.63	0.30	0.30	0.00
18.00	**0.65**	**535**	**337.14**	**0.56**	**0.56**	0.00
20.00	**0.28**	**278**	**336.64**	**0.31**	**0.31**	0.00
22.00	0.23	187	336.47	0.23	0.23	0.00
24.00	0.22	173	336.44	0.22	0.22	0.00
26.00	0.00	7	336.11	0.00	0.00	0.00
28.00	0.00	3	336.11	0.00	0.00	0.00
30.00	0.00	2	336.10	0.00	0.00	0.00
32.00	0.00	1	336.10	0.00	0.00	0.00
34.00	0.00	0	336.10	0.00	0.00	0.00
36.00	0.00	0	336.10	0.00	0.00	0.00
38.00	0.00	0	336.10	0.00	0.00	0.00
40.00	0.00	0	336.10	0.00	0.00	0.00
42.00	0.00	0	336.10	0.00	0.00	0.00
44.00	0.00	0	336.10	0.00	0.00	0.00
46.00	0.00	0	336.10	0.00	0.00	0.00
48.00	0.00	0	336.10	0.00	0.00	0.00
50.00	0.00	0	336.10	0.00	0.00	0.00
52.00	0.00	0	336.10	0.00	0.00	0.00
54.00	0.00	0	336.10	0.00	0.00	0.00
56.00	0.00	0	336.10	0.00	0.00	0.00
58.00	0.00	0	336.10	0.00	0.00	0.00
60.00	0.00	0	336.10	0.00	0.00	0.00
62.00	0.00	0	336.10	0.00	0.00	0.00
64.00	0.00	0	336.10	0.00	0.00	0.00
66.00	0.00	0	336.10	0.00	0.00	0.00
68.00	0.00	0	336.10	0.00	0.00	0.00
70.00	0.00	0	336.10	0.00	0.00	0.00
72.00	0.00	0	336.10	0.00	0.00	0.00
74.00	0.00	0	336.10	0.00	0.00	0.00
76.00	0.00	0	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 8 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.00	0	336.10	0.00	0.00	0.00
6.00	0.00	0	336.10	0.00	0.00	0.00
8.00	0.00	3	336.10	0.00	0.00	0.00
10.00	0.01	45	336.15	0.00	0.00	0.00
12.00	0.02	82	336.19	0.01	0.01	0.00
14.00	0.04	124	336.24	0.02	0.02	0.00
16.00	0.05	185	336.31	0.04	0.04	0.00
18.00	**0.11**	**360**	**336.51**	**0.06**	**0.06**	0.00
20.00	**0.05**	**476**	**336.64**	**0.07**	**0.07**	0.00
22.00	0.05	359	336.51	0.06	0.06	0.00
24.00	0.04	286	336.42	0.05	0.05	0.00
26.00	0.00	87	336.20	0.01	0.01	0.00
28.00	0.00	36	336.14	0.00	0.00	0.00
30.00	0.00	19	336.12	0.00	0.00	0.00
32.00	0.00	12	336.11	0.00	0.00	0.00
34.00	0.00	9	336.11	0.00	0.00	0.00
36.00	0.00	8	336.11	0.00	0.00	0.00
38.00	0.00	7	336.11	0.00	0.00	0.00
40.00	0.00	6	336.11	0.00	0.00	0.00
42.00	0.00	5	336.11	0.00	0.00	0.00
44.00	0.00	4	336.10	0.00	0.00	0.00
46.00	0.00	4	336.10	0.00	0.00	0.00
48.00	0.00	3	336.10	0.00	0.00	0.00
50.00	0.00	3	336.10	0.00	0.00	0.00
52.00	0.00	2	336.10	0.00	0.00	0.00
54.00	0.00	2	336.10	0.00	0.00	0.00
56.00	0.00	2	336.10	0.00	0.00	0.00
58.00	0.00	2	336.10	0.00	0.00	0.00
60.00	0.00	1	336.10	0.00	0.00	0.00
62.00	0.00	1	336.10	0.00	0.00	0.00
64.00	0.00	1	336.10	0.00	0.00	0.00
66.00	0.00	1	336.10	0.00	0.00	0.00
68.00	0.00	1	336.10	0.00	0.00	0.00
70.00	0.00	1	336.10	0.00	0.00	0.00
72.00	0.00	1	336.10	0.00	0.00	0.00
74.00	0.00	0	336.10	0.00	0.00	0.00
76.00	0.00	0	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 8 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.10	0.00	0.00	**0.00**
2.00	0.00	0	336.10	0.00	0.00	0.00
4.00	0.04	47	336.15	0.01	0.01	0.00
6.00	0.14	470	336.63	0.07	0.07	0.00
8.00	0.18	924	337.15	0.11	0.11	0.00
10.00	0.20	1,113	337.36	0.20	0.20	0.00
12.00	0.22	1,127	337.38	0.21	0.21	0.00
14.00	0.34	1,306	337.58	0.26	0.26	0.00
16.00	0.41	1,578	337.88	0.33	0.33	0.00
18.00	**0.75**	**2,164**	**339.86**	**0.59**	**0.59**	0.00
20.00	**0.32**	**1,829**	**338.35**	**0.40**	**0.40**	0.00
22.00	0.26	1,441	337.73	0.30	0.30	0.00
24.00	0.25	1,284	337.55	0.26	0.26	0.00
26.00	0.00	557	336.73	0.08	0.08	0.00
28.00	0.00	160	336.28	0.03	0.03	0.00
30.00	0.00	50	336.16	0.01	0.01	0.00
32.00	0.00	24	336.13	0.00	0.00	0.00
34.00	0.00	14	336.12	0.00	0.00	0.00
36.00	0.00	10	336.11	0.00	0.00	0.00
38.00	0.00	8	336.11	0.00	0.00	0.00
40.00	0.00	7	336.11	0.00	0.00	0.00
42.00	0.00	6	336.11	0.00	0.00	0.00
44.00	0.00	5	336.11	0.00	0.00	0.00
46.00	0.00	5	336.11	0.00	0.00	0.00
48.00	0.00	4	336.10	0.00	0.00	0.00
50.00	0.00	3	336.10	0.00	0.00	0.00
52.00	0.00	3	336.10	0.00	0.00	0.00
54.00	0.00	3	336.10	0.00	0.00	0.00
56.00	0.00	2	336.10	0.00	0.00	0.00
58.00	0.00	2	336.10	0.00	0.00	0.00
60.00	0.00	2	336.10	0.00	0.00	0.00
62.00	0.00	1	336.10	0.00	0.00	0.00
64.00	0.00	1	336.10	0.00	0.00	0.00
66.00	0.00	1	336.10	0.00	0.00	0.00
68.00	0.00	1	336.10	0.00	0.00	0.00
70.00	0.00	1	336.10	0.00	0.00	0.00
72.00	0.00	1	336.10	0.00	0.00	0.00
74.00	0.00	1	336.10	0.00	0.00	0.00
76.00	0.00	1	336.10	0.00	0.00	0.00
78.00	0.00	0	336.10	0.00	0.00	0.00
80.00	0.00	0	336.10	0.00	0.00	0.00
82.00	0.00	0	336.10	0.00	0.00	0.00
84.00	0.00	0	336.10	0.00	0.00	0.00
86.00	0.00	0	336.10	0.00	0.00	0.00

DMA No. 9 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.25	0.00	0.00	**0.00**
2.00	0.00	0	337.25	0.00	0.00	0.00
4.00	0.00	0	337.25	0.00	0.00	0.00
6.00	0.00	0	337.25	0.00	0.00	0.00
8.00	0.00	0	337.25	0.00	0.00	0.00
10.00	0.00	1	337.25	0.00	0.00	0.00
12.00	0.01	18	337.29	0.00	0.00	0.00
14.00	0.02	38	337.33	0.01	0.01	0.00
16.00	0.03	55	337.37	0.03	0.03	0.00
18.00	**0.07**	**93**	**337.45**	**0.06**	**0.06**	0.00
20.00	**0.04**	**70**	**337.40**	**0.04**	**0.04**	0.00
22.00	0.03	63	337.38	0.03	0.03	0.00
24.00	0.03	62	337.38	0.03	0.03	0.00
26.00	0.00	12	337.27	0.00	0.00	0.00
28.00	0.00	5	337.26	0.00	0.00	0.00
30.00	0.00	4	337.26	0.00	0.00	0.00
32.00	0.00	3	337.26	0.00	0.00	0.00
34.00	0.00	2	337.25	0.00	0.00	0.00
36.00	0.00	1	337.25	0.00	0.00	0.00
38.00	0.00	1	337.25	0.00	0.00	0.00
40.00	0.00	1	337.25	0.00	0.00	0.00
42.00	0.00	0	337.25	0.00	0.00	0.00
44.00	0.00	0	337.25	0.00	0.00	0.00
46.00	0.00	0	337.25	0.00	0.00	0.00
48.00	0.00	0	337.25	0.00	0.00	0.00
50.00	0.00	0	337.25	0.00	0.00	0.00
52.00	0.00	0	337.25	0.00	0.00	0.00
54.00	0.00	0	337.25	0.00	0.00	0.00
56.00	0.00	0	337.25	0.00	0.00	0.00
58.00	0.00	0	337.25	0.00	0.00	0.00
60.00	0.00	0	337.25	0.00	0.00	0.00
62.00	0.00	0	337.25	0.00	0.00	0.00
64.00	0.00	0	337.25	0.00	0.00	0.00
66.00	0.00	0	337.25	0.00	0.00	0.00
68.00	0.00	0	337.25	0.00	0.00	0.00
70.00	0.00	0	337.25	0.00	0.00	0.00
72.00	0.00	0	337.25	0.00	0.00	0.00
74.00	0.00	0	337.25	0.00	0.00	0.00
76.00	0.00	0	337.25	0.00	0.00	0.00
78.00	0.00	0	337.25	0.00	0.00	0.00
80.00	0.00	0	337.25	0.00	0.00	0.00
82.00	0.00	0	337.25	0.00	0.00	0.00
84.00	0.00	0	337.25	0.00	0.00	0.00
86.00	0.00	0	337.25	0.00	0.00	0.00

DMA No. 9 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.25	0.00	0.00	**0.00**
2.00	0.00	0	337.25	0.00	0.00	0.00
4.00	0.00	1	337.25	0.00	0.00	0.00
6.00	0.09	111	337.48	0.08	0.08	0.00
8.00	0.13	165	337.60	0.11	0.11	0.00
10.00	0.15	249	337.77	0.15	0.15	0.00
12.00	0.17	277	337.83	0.16	0.16	0.00
14.00	0.27	417	338.13	0.24	0.24	0.00
16.00	0.34	462	338.22	0.32	0.32	0.00
18.00	**0.64**	**654**	**338.62**	**0.55**	**0.55**	0.00
20.00	**0.27**	**442**	**338.18**	**0.28**	**0.28**	0.00
22.00	0.22	406	338.10	0.23	0.23	0.00
24.00	0.21	396	338.08	0.22	0.22	0.00
26.00	0.00	22	337.30	0.01	0.01	0.00
28.00	0.00	6	337.26	0.00	0.00	0.00
30.00	0.00	4	337.26	0.00	0.00	0.00
32.00	0.00	3	337.26	0.00	0.00	0.00
34.00	0.00	2	337.25	0.00	0.00	0.00
36.00	0.00	1	337.25	0.00	0.00	0.00
38.00	0.00	1	337.25	0.00	0.00	0.00
40.00	0.00	1	337.25	0.00	0.00	0.00
42.00	0.00	1	337.25	0.00	0.00	0.00
44.00	0.00	0	337.25	0.00	0.00	0.00
46.00	0.00	0	337.25	0.00	0.00	0.00
48.00	0.00	0	337.25	0.00	0.00	0.00
50.00	0.00	0	337.25	0.00	0.00	0.00
52.00	0.00	0	337.25	0.00	0.00	0.00
54.00	0.00	0	337.25	0.00	0.00	0.00
56.00	0.00	0	337.25	0.00	0.00	0.00
58.00	0.00	0	337.25	0.00	0.00	0.00
60.00	0.00	0	337.25	0.00	0.00	0.00
62.00	0.00	0	337.25	0.00	0.00	0.00
64.00	0.00	0	337.25	0.00	0.00	0.00
66.00	0.00	0	337.25	0.00	0.00	0.00
68.00	0.00	0	337.25	0.00	0.00	0.00
70.00	0.00	0	337.25	0.00	0.00	0.00
72.00	0.00	0	337.25	0.00	0.00	0.00
74.00	0.00	0	337.25	0.00	0.00	0.00
76.00	0.00	0	337.25	0.00	0.00	0.00
78.00	0.00	0	337.25	0.00	0.00	0.00
80.00	0.00	0	337.25	0.00	0.00	0.00
82.00	0.00	0	337.25	0.00	0.00	0.00
84.00	0.00	0	337.25	0.00	0.00	0.00
86.00	0.00	0	337.25	0.00	0.00	0.00

DMA No. 10 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.36	0.00	0.00	**0.00**
2.00	0.00	0	336.36	0.00	0.00	0.00
4.00	0.00	0	336.36	0.00	0.00	0.00
6.00	0.00	0	336.36	0.00	0.00	0.00
8.00	0.00	6	336.38	0.00	0.00	0.00
10.00	0.01	15	336.40	0.01	0.01	0.00
12.00	0.01	20	336.41	0.01	0.01	0.00
14.00	0.02	31	336.44	0.01	0.01	0.00
16.00	0.02	44	336.47	0.02	0.02	0.00
18.00	**0.05**	**92**	**336.59**	**0.03**	**0.03**	0.00
20.00	**0.02**	**91**	**336.58**	**0.03**	**0.03**	0.00
22.00	0.02	50	336.48	0.02	0.02	0.00
24.00	0.02	44	336.47	0.02	0.02	0.00
26.00	0.00	5	336.37	0.00	0.00	0.00
28.00	0.00	3	336.37	0.00	0.00	0.00
30.00	0.00	1	336.36	0.00	0.00	0.00
32.00	0.00	1	336.36	0.00	0.00	0.00
34.00	0.00	0	336.36	0.00	0.00	0.00
36.00	0.00	0	336.36	0.00	0.00	0.00
38.00	0.00	0	336.36	0.00	0.00	0.00
40.00	0.00	0	336.36	0.00	0.00	0.00
42.00	0.00	0	336.36	0.00	0.00	0.00
44.00	0.00	0	336.36	0.00	0.00	0.00
46.00	0.00	0	336.36	0.00	0.00	0.00
48.00	0.00	0	336.36	0.00	0.00	0.00
50.00	0.00	0	336.36	0.00	0.00	0.00
52.00	0.00	0	336.36	0.00	0.00	0.00
54.00	0.00	0	336.36	0.00	0.00	0.00
56.00	0.00	0	336.36	0.00	0.00	0.00
58.00	0.00	0	336.36	0.00	0.00	0.00
60.00	0.00	0	336.36	0.00	0.00	0.00
62.00	0.00	0	336.36	0.00	0.00	0.00
64.00	0.00	0	336.36	0.00	0.00	0.00
66.00	0.00	0	336.36	0.00	0.00	0.00
68.00	0.00	0	336.36	0.00	0.00	0.00
70.00	0.00	0	336.36	0.00	0.00	0.00
72.00	0.00	0	336.36	0.00	0.00	0.00
74.00	0.00	0	336.36	0.00	0.00	0.00
76.00	0.00	0	336.36	0.00	0.00	0.00
78.00	0.00	0	336.36	0.00	0.00	0.00
80.00	0.00	0	336.36	0.00	0.00	0.00
82.00	0.00	0	336.36	0.00	0.00	0.00
84.00	0.00	0	336.36	0.00	0.00	0.00
86.00	0.00	0	336.36	0.00	0.00	0.00

DMA No. 10 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.36	0.00	0.00	**0.00**
2.00	0.00	0	336.36	0.00	0.00	0.00
4.00	0.02	25	336.42	0.01	0.01	0.00
6.00	0.06	157	336.74	0.05	0.05	0.00
8.00	0.08	255	336.99	0.06	0.06	0.00
10.00	0.08	383	337.30	0.07	0.07	0.00
12.00	0.09	439	337.44	0.08	0.08	0.00
14.00	0.14	584	337.79	0.09	0.09	0.00
16.00	0.17	720	338.12	0.14	0.14	0.00
18.00	**0.31**	**915**	**339.30**	**0.25**	**0.25**	0.00
20.00	**0.13**	**763**	**338.23**	**0.16**	**0.16**	0.00
22.00	0.11	661	337.98	0.11	0.11	0.00
24.00	0.10	645	337.94	0.10	0.10	0.00
26.00	0.00	191	336.83	0.05	0.05	0.00
28.00	0.00	12	336.39	0.00	0.00	0.00
30.00	0.00	3	336.37	0.00	0.00	0.00
32.00	0.00	2	336.36	0.00	0.00	0.00
34.00	0.00	1	336.36	0.00	0.00	0.00
36.00	0.00	0	336.36	0.00	0.00	0.00
38.00	0.00	0	336.36	0.00	0.00	0.00
40.00	0.00	0	336.36	0.00	0.00	0.00
42.00	0.00	0	336.36	0.00	0.00	0.00
44.00	0.00	0	336.36	0.00	0.00	0.00
46.00	0.00	0	336.36	0.00	0.00	0.00
48.00	0.00	0	336.36	0.00	0.00	0.00
50.00	0.00	0	336.36	0.00	0.00	0.00
52.00	0.00	0	336.36	0.00	0.00	0.00
54.00	0.00	0	336.36	0.00	0.00	0.00
56.00	0.00	0	336.36	0.00	0.00	0.00
58.00	0.00	0	336.36	0.00	0.00	0.00
60.00	0.00	0	336.36	0.00	0.00	0.00
62.00	0.00	0	336.36	0.00	0.00	0.00
64.00	0.00	0	336.36	0.00	0.00	0.00
66.00	0.00	0	336.36	0.00	0.00	0.00
68.00	0.00	0	336.36	0.00	0.00	0.00
70.00	0.00	0	336.36	0.00	0.00	0.00
72.00	0.00	0	336.36	0.00	0.00	0.00
74.00	0.00	0	336.36	0.00	0.00	0.00
76.00	0.00	0	336.36	0.00	0.00	0.00
78.00	0.00	0	336.36	0.00	0.00	0.00
80.00	0.00	0	336.36	0.00	0.00	0.00
82.00	0.00	0	336.36	0.00	0.00	0.00
84.00	0.00	0	336.36	0.00	0.00	0.00
86.00	0.00	0	336.36	0.00	0.00	0.00

DMA No. 11 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.18	0.00	0.00	**0.00**
2.00	0.00	0	337.18	0.00	0.00	0.00
4.00	0.00	0	337.18	0.00	0.00	0.00
6.00	0.00	0	337.18	0.00	0.00	0.00
8.00	0.00	11	337.21	0.00	0.00	0.00
10.00	0.01	24	337.24	0.01	0.01	0.00
12.00	0.01	32	337.26	0.01	0.01	0.00
14.00	0.02	50	337.30	0.01	0.01	0.00
16.00	0.03	76	337.36	0.02	0.02	0.00
18.00	**0.06**	**162**	**337.57**	**0.03**	**0.03**	0.00
20.00	**0.02**	**183**	**337.62**	**0.03**	**0.03**	0.00
22.00	0.02	125	337.48	0.03	0.03	0.00
24.00	0.02	94	337.40	0.02	0.02	0.00
26.00	0.00	15	337.22	0.00	0.00	0.00
28.00	0.00	5	337.19	0.00	0.00	0.00
30.00	0.00	3	337.19	0.00	0.00	0.00
32.00	0.00	2	337.18	0.00	0.00	0.00
34.00	0.00	1	337.18	0.00	0.00	0.00
36.00	0.00	1	337.18	0.00	0.00	0.00
38.00	0.00	1	337.18	0.00	0.00	0.00
40.00	0.00	0	337.18	0.00	0.00	0.00
42.00	0.00	0	337.18	0.00	0.00	0.00
44.00	0.00	0	337.18	0.00	0.00	0.00
46.00	0.00	0	337.18	0.00	0.00	0.00
48.00	0.00	0	337.18	0.00	0.00	0.00
50.00	0.00	0	337.18	0.00	0.00	0.00
52.00	0.00	0	337.18	0.00	0.00	0.00
54.00	0.00	0	337.18	0.00	0.00	0.00
56.00	0.00	0	337.18	0.00	0.00	0.00
58.00	0.00	0	337.18	0.00	0.00	0.00
60.00	0.00	0	337.18	0.00	0.00	0.00
62.00	0.00	0	337.18	0.00	0.00	0.00
64.00	0.00	0	337.18	0.00	0.00	0.00
66.00	0.00	0	337.18	0.00	0.00	0.00
68.00	0.00	0	337.18	0.00	0.00	0.00
70.00	0.00	0	337.18	0.00	0.00	0.00
72.00	0.00	0	337.18	0.00	0.00	0.00
74.00	0.00	0	337.18	0.00	0.00	0.00
76.00	0.00	0	337.18	0.00	0.00	0.00
78.00	0.00	0	337.18	0.00	0.00	0.00
80.00	0.00	0	337.18	0.00	0.00	0.00
82.00	0.00	0	337.18	0.00	0.00	0.00
84.00	0.00	0	337.18	0.00	0.00	0.00
86.00	0.00	0	337.18	0.00	0.00	0.00

DMA No. 11 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.18	0.00	0.00	**0.00**
2.00	0.00	0	337.18	0.00	0.00	0.00
4.00	0.03	44	337.29	0.01	0.01	0.00
6.00	0.07	248	337.77	0.04	0.04	0.00
8.00	0.08	428	338.20	0.05	0.05	0.00
10.00	0.08	640	338.70	0.06	0.06	0.00
12.00	0.09	777	339.03	0.07	0.07	0.00
14.00	0.15	957	340.26	0.14	0.14	0.00
16.00	0.18	980	340.49	0.16	0.16	0.00
18.00	**0.33**	**1,122**	**341.25**	**0.29**	**0.29**	0.00
20.00	**0.13**	**954**	**340.23**	**0.13**	**0.13**	0.00
22.00	0.10	940	340.10	0.10	0.10	0.00
24.00	0.10	937	340.08	0.10	0.10	0.00
26.00	0.00	490	338.35	0.06	0.06	0.00
28.00	0.00	174	337.59	0.03	0.03	0.00
30.00	0.00	29	337.25	0.01	0.01	0.00
32.00	0.00	6	337.19	0.00	0.00	0.00
34.00	0.00	3	337.19	0.00	0.00	0.00
36.00	0.00	2	337.19	0.00	0.00	0.00
38.00	0.00	1	337.18	0.00	0.00	0.00
40.00	0.00	1	337.18	0.00	0.00	0.00
42.00	0.00	1	337.18	0.00	0.00	0.00
44.00	0.00	0	337.18	0.00	0.00	0.00
46.00	0.00	0	337.18	0.00	0.00	0.00
48.00	0.00	0	337.18	0.00	0.00	0.00
50.00	0.00	0	337.18	0.00	0.00	0.00
52.00	0.00	0	337.18	0.00	0.00	0.00
54.00	0.00	0	337.18	0.00	0.00	0.00
56.00	0.00	0	337.18	0.00	0.00	0.00
58.00	0.00	0	337.18	0.00	0.00	0.00
60.00	0.00	0	337.18	0.00	0.00	0.00
62.00	0.00	0	337.18	0.00	0.00	0.00
64.00	0.00	0	337.18	0.00	0.00	0.00
66.00	0.00	0	337.18	0.00	0.00	0.00
68.00	0.00	0	337.18	0.00	0.00	0.00
70.00	0.00	0	337.18	0.00	0.00	0.00
72.00	0.00	0	337.18	0.00	0.00	0.00
74.00	0.00	0	337.18	0.00	0.00	0.00
76.00	0.00	0	337.18	0.00	0.00	0.00
78.00	0.00	0	337.18	0.00	0.00	0.00
80.00	0.00	0	337.18	0.00	0.00	0.00
82.00	0.00	0	337.18	0.00	0.00	0.00
84.00	0.00	0	337.18	0.00	0.00	0.00
86.00	0.00	0	337.18	0.00	0.00	0.00

DMA No. 12 & 13 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.00	0	337.37	0.00	0.00	0.00
7.50	0.00	0	337.37	0.00	0.00	0.00
10.00	0.00	15	337.40	0.00	0.00	0.00
12.50	0.01	31	337.44	0.01	0.01	0.00
15.00	0.02	48	337.48	0.02	0.02	0.00
17.50	**0.04**	**80**	**337.55**	**0.03**	**0.03**	0.00
20.00	**0.03**	**81**	**337.55**	**0.03**	**0.03**	0.00
22.50	0.02	59	337.50	0.02	0.02	0.00
25.00	0.00	24	337.42	0.01	0.01	0.00
27.50	0.00	6	337.38	0.00	0.00	0.00
30.00	0.00	4	337.38	0.00	0.00	0.00
32.50	0.00	3	337.38	0.00	0.00	0.00
35.00	0.00	2	337.37	0.00	0.00	0.00
37.50	0.00	1	337.37	0.00	0.00	0.00
40.00	0.00	1	337.37	0.00	0.00	0.00
42.50	0.00	1	337.37	0.00	0.00	0.00
45.00	0.00	0	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 12 & 13 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.05	81	337.55	0.03	0.03	0.00
7.50	0.08	209	337.84	0.07	0.07	0.00
10.00	0.10	359	338.18	0.09	0.09	0.00
12.50	0.12	406	338.29	0.11	0.11	0.00
15.00	0.15	453	338.39	0.16	0.16	0.00
17.50	**0.30**	**575**	**338.66**	**0.25**	**0.25**	0.00
20.00	**0.16**	**467**	**338.42**	**0.18**	**0.18**	0.00
22.50	0.13	425	338.33	0.13	0.13	0.00
25.00	0.00	179	337.77	0.06	0.06	0.00
27.50	0.00	13	337.40	0.00	0.00	0.00
30.00	0.00	5	337.38	0.00	0.00	0.00
32.50	0.00	3	337.38	0.00	0.00	0.00
35.00	0.00	2	337.37	0.00	0.00	0.00
37.50	0.00	2	337.37	0.00	0.00	0.00
40.00	0.00	1	337.37	0.00	0.00	0.00
42.50	0.00	1	337.37	0.00	0.00	0.00
45.00	0.00	1	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 14 & 15 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.00	0	337.37	0.00	0.00	0.00
7.50	0.00	0	337.37	0.00	0.00	0.00
10.00	0.00	2	337.37	0.00	0.00	0.00
12.50	0.01	17	337.40	0.01	0.01	0.00
15.00	0.02	34	337.44	0.02	0.02	0.00
17.50	**0.06**	**55**	**337.48**	**0.05**	**0.05**	0.00
20.00	**0.04**	**47**	**337.46**	**0.04**	**0.04**	0.00
22.50	0.03	43	337.45	0.03	0.03	0.00
25.00	0.00	11	337.39	0.00	0.00	0.00
27.50	0.00	3	337.38	0.00	0.00	0.00
30.00	0.00	1	337.37	0.00	0.00	0.00
32.50	0.00	1	337.37	0.00	0.00	0.00
35.00	0.00	0	337.37	0.00	0.00	0.00
37.50	0.00	0	337.37	0.00	0.00	0.00
40.00	0.00	0	337.37	0.00	0.00	0.00
42.50	0.00	0	337.37	0.00	0.00	0.00
45.00	0.00	0	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 14 & 15 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.37	0.00	0.00	**0.00**
2.50	0.00	0	337.37	0.00	0.00	0.00
5.00	0.06	52	337.47	0.04	0.04	0.00
7.50	0.11	88	337.54	0.10	0.10	0.00
10.00	0.14	112	337.59	0.15	0.15	0.00
12.50	0.18	132	337.63	0.17	0.17	0.00
15.00	0.24	215	337.80	0.26	0.26	0.00
17.50	**0.50**	**440**	**338.24**	**0.42**	**0.42**	0.00
20.00	**0.26**	**244**	**337.86**	**0.28**	**0.28**	0.00
22.50	0.21	167	337.70	0.21	0.21	0.00
25.00	0.00	17	337.40	0.01	0.01	0.00
27.50	0.00	3	337.38	0.00	0.00	0.00
30.00	0.00	2	337.37	0.00	0.00	0.00
32.50	0.00	1	337.37	0.00	0.00	0.00
35.00	0.00	0	337.37	0.00	0.00	0.00
37.50	0.00	0	337.37	0.00	0.00	0.00
40.00	0.00	0	337.37	0.00	0.00	0.00
42.50	0.00	0	337.37	0.00	0.00	0.00
45.00	0.00	0	337.37	0.00	0.00	0.00
47.50	0.00	0	337.37	0.00	0.00	0.00
50.00	0.00	0	337.37	0.00	0.00	0.00
52.50	0.00	0	337.37	0.00	0.00	0.00
55.00	0.00	0	337.37	0.00	0.00	0.00
57.50	0.00	0	337.37	0.00	0.00	0.00
60.00	0.00	0	337.37	0.00	0.00	0.00
62.50	0.00	0	337.37	0.00	0.00	0.00
65.00	0.00	0	337.37	0.00	0.00	0.00
67.50	0.00	0	337.37	0.00	0.00	0.00
70.00	0.00	0	337.37	0.00	0.00	0.00
72.50	0.00	0	337.37	0.00	0.00	0.00
75.00	0.00	0	337.37	0.00	0.00	0.00
77.50	0.00	0	337.37	0.00	0.00	0.00
80.00	0.00	0	337.37	0.00	0.00	0.00
82.50	0.00	0	337.37	0.00	0.00	0.00
85.00	0.00	0	337.37	0.00	0.00	0.00

DMA No. 16 & 17 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.87	0.00	0.00	**0.00**
2.00	0.00	0	336.87	0.00	0.00	0.00
4.00	0.00	0	336.87	0.00	0.00	0.00
6.00	0.00	0	336.87	0.00	0.00	0.00
8.00	0.00	0	336.87	0.00	0.00	0.00
10.00	0.00	1	336.87	0.00	0.00	0.00
12.00	0.01	15	336.90	0.00	0.00	0.00
14.00	0.02	32	336.93	0.01	0.01	0.00
16.00	0.03	45	336.96	0.03	0.03	0.00
18.00	**0.07**	**83**	**337.03**	**0.06**	**0.06**	0.00
20.00	**0.04**	**61**	**336.99**	**0.04**	**0.04**	0.00
22.00	0.03	53	336.97	0.03	0.03	0.00
24.00	0.03	52	336.97	0.03	0.03	0.00
26.00	0.00	7	336.88	0.00	0.00	0.00
28.00	0.00	4	336.88	0.00	0.00	0.00
30.00	0.00	2	336.87	0.00	0.00	0.00
32.00	0.00	1	336.87	0.00	0.00	0.00
34.00	0.00	1	336.87	0.00	0.00	0.00
36.00	0.00	0	336.87	0.00	0.00	0.00
38.00	0.00	0	336.87	0.00	0.00	0.00
40.00	0.00	0	336.87	0.00	0.00	0.00
42.00	0.00	0	336.87	0.00	0.00	0.00
44.00	0.00	0	336.87	0.00	0.00	0.00
46.00	0.00	0	336.87	0.00	0.00	0.00
48.00	0.00	0	336.87	0.00	0.00	0.00
50.00	0.00	0	336.87	0.00	0.00	0.00
52.00	0.00	0	336.87	0.00	0.00	0.00
54.00	0.00	0	336.87	0.00	0.00	0.00
56.00	0.00	0	336.87	0.00	0.00	0.00
58.00	0.00	0	336.87	0.00	0.00	0.00
60.00	0.00	0	336.87	0.00	0.00	0.00
62.00	0.00	0	336.87	0.00	0.00	0.00
64.00	0.00	0	336.87	0.00	0.00	0.00
66.00	0.00	0	336.87	0.00	0.00	0.00
68.00	0.00	0	336.87	0.00	0.00	0.00
70.00	0.00	0	336.87	0.00	0.00	0.00
72.00	0.00	0	336.87	0.00	0.00	0.00
74.00	0.00	0	336.87	0.00	0.00	0.00
76.00	0.00	0	336.87	0.00	0.00	0.00
78.00	0.00	0	336.87	0.00	0.00	0.00
80.00	0.00	0	336.87	0.00	0.00	0.00
82.00	0.00	0	336.87	0.00	0.00	0.00
84.00	0.00	0	336.87	0.00	0.00	0.00
86.00	0.00	0	336.87	0.00	0.00	0.00

DMA No. 16 & 17 100 vear event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.87	0.00	0.00	**0.00**
2.00	0.00	0	336.87	0.00	0.00	0.00
4.00	0.00	1	336.87	0.00	0.00	0.00
6.00	0.08	104	337.07	0.07	0.07	0.00
8.00	0.12	168	337.20	0.10	0.10	0.00
10.00	0.14	271	337.40	0.14	0.14	0.00
12.00	0.16	306	337.47	0.15	0.15	0.00
14.00	0.26	485	337.82	0.20	0.20	0.00
16.00	0.32	674	338.19	0.29	0.29	0.00
18.00	**0.61**	**976**	**338.78**	**0.47**	**0.47**	0.00
20.00	**0.26**	**681**	**338.20**	**0.30**	**0.30**	0.00
22.00	0.21	595	338.03	0.22	0.22	0.00
24.00	0.20	556	337.96	0.21	0.21	0.00
26.00	0.00	23	336.91	0.01	0.01	0.00
28.00	0.00	5	336.88	0.00	0.00	0.00
30.00	0.00	3	336.88	0.00	0.00	0.00
32.00	0.00	2	336.87	0.00	0.00	0.00
34.00	0.00	1	336.87	0.00	0.00	0.00
36.00	0.00	1	336.87	0.00	0.00	0.00
38.00	0.00	0	336.87	0.00	0.00	0.00
40.00	0.00	0	336.87	0.00	0.00	0.00
42.00	0.00	0	336.87	0.00	0.00	0.00
44.00	0.00	0	336.87	0.00	0.00	0.00
46.00	0.00	0	336.87	0.00	0.00	0.00
48.00	0.00	0	336.87	0.00	0.00	0.00
50.00	0.00	0	336.87	0.00	0.00	0.00
52.00	0.00	0	336.87	0.00	0.00	0.00
54.00	0.00	0	336.87	0.00	0.00	0.00
56.00	0.00	0	336.87	0.00	0.00	0.00
58.00	0.00	0	336.87	0.00	0.00	0.00
60.00	0.00	0	336.87	0.00	0.00	0.00
62.00	0.00	0	336.87	0.00	0.00	0.00
64.00	0.00	0	336.87	0.00	0.00	0.00
66.00	0.00	0	336.87	0.00	0.00	0.00
68.00	0.00	0	336.87	0.00	0.00	0.00
70.00	0.00	0	336.87	0.00	0.00	0.00
72.00	0.00	0	336.87	0.00	0.00	0.00
74.00	0.00	0	336.87	0.00	0.00	0.00
76.00	0.00	0	336.87	0.00	0.00	0.00
78.00	0.00	0	336.87	0.00	0.00	0.00
80.00	0.00	0	336.87	0.00	0.00	0.00
82.00	0.00	0	336.87	0.00	0.00	0.00
84.00	0.00	0	336.87	0.00	0.00	0.00
86.00	0.00	0	336.87	0.00	0.00	0.00

DMA No. 18 & 19 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.16	0.00	0.00	**0.00**
2.00	0.00	0	336.16	0.00	0.00	0.00
4.00	0.00	0	336.16	0.00	0.00	0.00
6.00	0.00	0	336.16	0.00	0.00	0.00
8.00	0.00	1	336.16	0.00	0.00	0.00
10.00	0.01	40	336.19	0.01	0.01	0.00
12.00	0.02	77	336.22	0.02	0.02	0.00
14.00	0.05	114	336.25	0.04	0.04	0.00
16.00	0.07	154	336.28	0.06	0.06	0.00
18.00	**0.16**	**276**	**336.37**	**0.11**	**0.11**	0.00
20.00	**0.08**	**240**	**336.34**	**0.10**	**0.10**	0.00
22.00	0.06	172	336.29	0.07	0.07	0.00
24.00	0.06	164	336.29	0.06	0.06	0.00
26.00	0.00	37	336.19	0.01	0.01	0.00
28.00	0.00	15	336.17	0.00	0.00	0.00
30.00	0.00	11	336.17	0.00	0.00	0.00
32.00	0.00	8	336.17	0.00	0.00	0.00
34.00	0.00	6	336.16	0.00	0.00	0.00
36.00	0.00	4	336.16	0.00	0.00	0.00
38.00	0.00	3	336.16	0.00	0.00	0.00
40.00	0.00	2	336.16	0.00	0.00	0.00
42.00	0.00	2	336.16	0.00	0.00	0.00
44.00	0.00	1	336.16	0.00	0.00	0.00
46.00	0.00	1	336.16	0.00	0.00	0.00
48.00	0.00	1	336.16	0.00	0.00	0.00
50.00	0.00	1	336.16	0.00	0.00	0.00
52.00	0.00	0	336.16	0.00	0.00	0.00
54.00	0.00	0	336.16	0.00	0.00	0.00
56.00	0.00	0	336.16	0.00	0.00	0.00
58.00	0.00	0	336.16	0.00	0.00	0.00
60.00	0.00	0	336.16	0.00	0.00	0.00
62.00	0.00	0	336.16	0.00	0.00	0.00
64.00	0.00	0	336.16	0.00	0.00	0.00
66.00	0.00	0	336.16	0.00	0.00	0.00
68.00	0.00	0	336.16	0.00	0.00	0.00
70.00	0.00	0	336.16	0.00	0.00	0.00
72.00	0.00	0	336.16	0.00	0.00	0.00
74.00	0.00	0	336.16	0.00	0.00	0.00
76.00	0.00	0	336.16	0.00	0.00	0.00
78.00	0.00	0	336.16	0.00	0.00	0.00
80.00	0.00	0	336.16	0.00	0.00	0.00
82.00	0.00	0	336.16	0.00	0.00	0.00
84.00	0.00	0	336.16	0.00	0.00	0.00
86.00	0.00	0	336.16	0.00	0.00	0.00

DMA No. 18 & 19 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.16	0.00	0.00	**0.00**
2.00	0.00	0	336.16	0.00	0.00	0.00
4.00	0.04	44	336.19	0.01	0.01	0.00
6.00	0.19	400	336.47	0.15	0.15	0.00
8.00	0.25	642	336.65	0.20	0.20	0.00
10.00	0.28	991	336.92	0.26	0.26	0.00
12.00	0.31	1,130	337.03	0.28	0.28	0.00
14.00	0.48	1,578	337.37	0.33	0.33	0.00
16.00	0.59	2,393	338.00	0.42	0.42	0.00
18.00	**1.10**	**4,078**	**339.37**	**0.71**	**0.71**	0.00
20.00	**0.46**	**3,967**	**339.28**	**0.69**	**0.69**	0.00
22.00	0.38	3,062	338.54	0.48	0.48	0.00
24.00	0.36	2,484	338.07	0.43	0.43	0.00
26.00	0.00	569	336.60	0.19	0.19	0.00
28.00	0.00	55	336.20	0.01	0.01	0.00
30.00	0.00	18	336.17	0.00	0.00	0.00
32.00	0.00	12	336.17	0.00	0.00	0.00
34.00	0.00	9	336.17	0.00	0.00	0.00
36.00	0.00	6	336.16	0.00	0.00	0.00
38.00	0.00	5	336.16	0.00	0.00	0.00
40.00	0.00	3	336.16	0.00	0.00	0.00
42.00	0.00	3	336.16	0.00	0.00	0.00
44.00	0.00	2	336.16	0.00	0.00	0.00
46.00	0.00	1	336.16	0.00	0.00	0.00
48.00	0.00	1	336.16	0.00	0.00	0.00
50.00	0.00	1	336.16	0.00	0.00	0.00
52.00	0.00	1	336.16	0.00	0.00	0.00
54.00	0.00	0	336.16	0.00	0.00	0.00
56.00	0.00	0	336.16	0.00	0.00	0.00
58.00	0.00	0	336.16	0.00	0.00	0.00
60.00	0.00	0	336.16	0.00	0.00	0.00
62.00	0.00	0	336.16	0.00	0.00	0.00
64.00	0.00	0	336.16	0.00	0.00	0.00
66.00	0.00	0	336.16	0.00	0.00	0.00
68.00	0.00	0	336.16	0.00	0.00	0.00
70.00	0.00	0	336.16	0.00	0.00	0.00
72.00	0.00	0	336.16	0.00	0.00	0.00
74.00	0.00	0	336.16	0.00	0.00	0.00
76.00	0.00	0	336.16	0.00	0.00	0.00
78.00	0.00	0	336.16	0.00	0.00	0.00
80.00	0.00	0	336.16	0.00	0.00	0.00
82.00	0.00	0	336.16	0.00	0.00	0.00
84.00	0.00	0	336.16	0.00	0.00	0.00
86.00	0.00	0	336.16	0.00	0.00	0.00

DMA No. 20 & 21 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.13	0.00	0.00	**0.00**
2.00	0.00	0	336.13	0.00	0.00	0.00
4.00	0.00	0	336.13	0.00	0.00	0.00
6.00	0.00	0	336.13	0.00	0.00	0.00
8.00	0.00	0	336.13	0.00	0.00	0.00
10.00	0.00	7	336.14	0.00	0.00	0.00
12.00	0.01	23	336.16	0.01	0.01	0.00
14.00	0.03	46	336.20	0.02	0.02	0.00
16.00	0.04	64	336.22	0.04	0.04	0.00
18.00	**0.10**	**109**	**336.29**	**0.09**	**0.09**	0.00
20.00	**0.05**	**76**	**336.24**	**0.05**	**0.05**	0.00
22.00	0.04	69	336.23	0.04	0.04	0.00
24.00	0.04	68	336.23	0.04	0.04	0.00
26.00	0.00	9	336.14	0.00	0.00	0.00
28.00	0.00	5	336.14	0.00	0.00	0.00
30.00	0.00	3	336.13	0.00	0.00	0.00
32.00	0.00	2	336.13	0.00	0.00	0.00
34.00	0.00	1	336.13	0.00	0.00	0.00
36.00	0.00	1	336.13	0.00	0.00	0.00
38.00	0.00	0	336.13	0.00	0.00	0.00
40.00	0.00	0	336.13	0.00	0.00	0.00
42.00	0.00	0	336.13	0.00	0.00	0.00
44.00	0.00	0	336.13	0.00	0.00	0.00
46.00	0.00	0	336.13	0.00	0.00	0.00
48.00	0.00	0	336.13	0.00	0.00	0.00
50.00	0.00	0	336.13	0.00	0.00	0.00
52.00	0.00	0	336.13	0.00	0.00	0.00
54.00	0.00	0	336.13	0.00	0.00	0.00
56.00	0.00	0	336.13	0.00	0.00	0.00
58.00	0.00	0	336.13	0.00	0.00	0.00
60.00	0.00	0	336.13	0.00	0.00	0.00
62.00	0.00	0	336.13	0.00	0.00	0.00
64.00	0.00	0	336.13	0.00	0.00	0.00
66.00	0.00	0	336.13	0.00	0.00	0.00
68.00	0.00	0	336.13	0.00	0.00	0.00
70.00	0.00	0	336.13	0.00	0.00	0.00
72.00	0.00	0	336.13	0.00	0.00	0.00
74.00	0.00	0	336.13	0.00	0.00	0.00
76.00	0.00	0	336.13	0.00	0.00	0.00
78.00	0.00	0	336.13	0.00	0.00	0.00
80.00	0.00	0	336.13	0.00	0.00	0.00
82.00	0.00	0	336.13	0.00	0.00	0.00
84.00	0.00	0	336.13	0.00	0.00	0.00
86.00	0.00	0	336.13	0.00	0.00	0.00

DMA No. 20 & 21 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.13	0.00	0.00	**0.00**
2.00	0.00	0	336.13	0.00	0.00	0.00
4.00	0.01	7	336.14	0.00	0.00	0.00
6.00	0.12	125	336.31	0.11	0.11	0.00
8.00	0.16	160	336.36	0.15	0.15	0.00
10.00	0.19	200	336.42	0.19	0.19	0.00
12.00	0.22	220	336.45	0.21	0.21	0.00
14.00	0.35	355	336.64	0.29	0.29	0.00
16.00	0.43	496	336.85	0.36	0.36	0.00
18.00	**0.82**	**1,133**	**337.77**	**0.58**	**0.58**	0.00
20.00	**0.33**	**706**	**337.15**	**0.45**	**0.45**	0.00
22.00	0.27	344	336.63	0.29	0.29	0.00
24.00	0.26	303	336.57	0.26	0.26	0.00
26.00	0.00	13	336.15	0.00	0.00	0.00
28.00	0.00	6	336.14	0.00	0.00	0.00
30.00	0.00	4	336.14	0.00	0.00	0.00
32.00	0.00	2	336.13	0.00	0.00	0.00
34.00	0.00	1	336.13	0.00	0.00	0.00
36.00	0.00	1	336.13	0.00	0.00	0.00
38.00	0.00	1	336.13	0.00	0.00	0.00
40.00	0.00	0	336.13	0.00	0.00	0.00
42.00	0.00	0	336.13	0.00	0.00	0.00
44.00	0.00	0	336.13	0.00	0.00	0.00
46.00	0.00	0	336.13	0.00	0.00	0.00
48.00	0.00	0	336.13	0.00	0.00	0.00
50.00	0.00	0	336.13	0.00	0.00	0.00
52.00	0.00	0	336.13	0.00	0.00	0.00
54.00	0.00	0	336.13	0.00	0.00	0.00
56.00	0.00	0	336.13	0.00	0.00	0.00
58.00	0.00	0	336.13	0.00	0.00	0.00
60.00	0.00	0	336.13	0.00	0.00	0.00
62.00	0.00	0	336.13	0.00	0.00	0.00
64.00	0.00	0	336.13	0.00	0.00	0.00
66.00	0.00	0	336.13	0.00	0.00	0.00
68.00	0.00	0	336.13	0.00	0.00	0.00
70.00	0.00	0	336.13	0.00	0.00	0.00
72.00	0.00	0	336.13	0.00	0.00	0.00
74.00	0.00	0	336.13	0.00	0.00	0.00
76.00	0.00	0	336.13	0.00	0.00	0.00
78.00	0.00	0	336.13	0.00	0.00	0.00
80.00	0.00	0	336.13	0.00	0.00	0.00
82.00	0.00	0	336.13	0.00	0.00	0.00
84.00	0.00	0	336.13	0.00	0.00	0.00
86.00	0.00	0	336.13	0.00	0.00	0.00

DMA No. 22 & 23 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.65	0.00	0.00	**0.00**
2.00	0.00	0	337.65	0.00	0.00	0.00
4.00	0.00	0	337.65	0.00	0.00	0.00
6.00	0.00	0	337.65	0.00	0.00	0.00
8.00	0.00	0	337.65	0.00	0.00	0.00
10.00	0.01	11	337.67	0.00	0.00	0.00
12.00	0.01	24	337.69	0.01	0.01	0.00
14.00	0.03	42	337.72	0.02	0.02	0.00
16.00	0.04	55	337.74	0.04	0.04	0.00
18.00	**0.10**	**98**	**337.80**	**0.08**	**0.08**	0.00
20.00	**0.04**	**65**	**337.75**	**0.05**	**0.05**	0.00
22.00	0.04	58	337.74	0.04	0.04	0.00
24.00	0.04	57	337.74	0.04	0.04	0.00
26.00	0.00	7	337.66	0.00	0.00	0.00
28.00	0.00	4	337.66	0.00	0.00	0.00
30.00	0.00	2	337.65	0.00	0.00	0.00
32.00	0.00	1	337.65	0.00	0.00	0.00
34.00	0.00	1	337.65	0.00	0.00	0.00
36.00	0.00	0	337.65	0.00	0.00	0.00
38.00	0.00	0	337.65	0.00	0.00	0.00
40.00	0.00	0	337.65	0.00	0.00	0.00
42.00	0.00	0	337.65	0.00	0.00	0.00
44.00	0.00	0	337.65	0.00	0.00	0.00
46.00	0.00	0	337.65	0.00	0.00	0.00
48.00	0.00	0	337.65	0.00	0.00	0.00
50.00	0.00	0	337.65	0.00	0.00	0.00
52.00	0.00	0	337.65	0.00	0.00	0.00
54.00	0.00	0	337.65	0.00	0.00	0.00
56.00	0.00	0	337.65	0.00	0.00	0.00
58.00	0.00	0	337.65	0.00	0.00	0.00
60.00	0.00	0	337.65	0.00	0.00	0.00
62.00	0.00	0	337.65	0.00	0.00	0.00
64.00	0.00	0	337.65	0.00	0.00	0.00
66.00	0.00	0	337.65	0.00	0.00	0.00
68.00	0.00	0	337.65	0.00	0.00	0.00
70.00	0.00	0	337.65	0.00	0.00	0.00
72.00	0.00	0	337.65	0.00	0.00	0.00
74.00	0.00	0	337.65	0.00	0.00	0.00
76.00	0.00	0	337.65	0.00	0.00	0.00
78.00	0.00	0	337.65	0.00	0.00	0.00
80.00	0.00	0	337.65	0.00	0.00	0.00
82.00	0.00	0	337.65	0.00	0.00	0.00
84.00	0.00	0	337.65	0.00	0.00	0.00
86.00	0.00	0	337.65	0.00	0.00	0.00

DMA No. 22 & 23 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.65	0.00	0.00	**0.00**
2.00	0.00	0	337.65	0.00	0.00	0.00
4.00	0.02	13	337.67	0.00	0.00	0.00
6.00	0.11	122	337.84	0.10	0.10	0.00
8.00	0.15	174	337.92	0.14	0.14	0.00
10.00	0.17	249	338.04	0.17	0.17	0.00
12.00	0.20	273	338.08	0.18	0.18	0.00
14.00	0.31	449	338.35	0.25	0.25	0.00
16.00	0.39	676	338.71	0.32	0.32	0.00
18.00	**0.73**	**1,227**	**339.57**	**0.52**	**0.52**	0.00
20.00	**0.30**	**802**	**338.90**	**0.38**	**0.38**	0.00
22.00	0.24	515	338.46	0.27	0.27	0.00
24.00	0.23	425	338.31	0.24	0.24	0.00
26.00	0.00	13	337.67	0.00	0.00	0.00
28.00	0.00	5	337.66	0.00	0.00	0.00
30.00	0.00	3	337.65	0.00	0.00	0.00
32.00	0.00	1	337.65	0.00	0.00	0.00
34.00	0.00	1	337.65	0.00	0.00	0.00
36.00	0.00	0	337.65	0.00	0.00	0.00
38.00	0.00	0	337.65	0.00	0.00	0.00
40.00	0.00	0	337.65	0.00	0.00	0.00
42.00	0.00	0	337.65	0.00	0.00	0.00
44.00	0.00	0	337.65	0.00	0.00	0.00
46.00	0.00	0	337.65	0.00	0.00	0.00
48.00	0.00	0	337.65	0.00	0.00	0.00
50.00	0.00	0	337.65	0.00	0.00	0.00
52.00	0.00	0	337.65	0.00	0.00	0.00
54.00	0.00	0	337.65	0.00	0.00	0.00
56.00	0.00	0	337.65	0.00	0.00	0.00
58.00	0.00	0	337.65	0.00	0.00	0.00
60.00	0.00	0	337.65	0.00	0.00	0.00
62.00	0.00	0	337.65	0.00	0.00	0.00
64.00	0.00	0	337.65	0.00	0.00	0.00
66.00	0.00	0	337.65	0.00	0.00	0.00
68.00	0.00	0	337.65	0.00	0.00	0.00
70.00	0.00	0	337.65	0.00	0.00	0.00
72.00	0.00	0	337.65	0.00	0.00	0.00
74.00	0.00	0	337.65	0.00	0.00	0.00
76.00	0.00	0	337.65	0.00	0.00	0.00
78.00	0.00	0	337.65	0.00	0.00	0.00
80.00	0.00	0	337.65	0.00	0.00	0.00
82.00	0.00	0	337.65	0.00	0.00	0.00
84.00	0.00	0	337.65	0.00	0.00	0.00
86.00	0.00	0	337.65	0.00	0.00	0.00

DMA No. 24 & 25 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.24	0.00	0.00	**0.00**
2.00	0.00	0	336.24	0.00	0.00	0.00
4.00	0.00	0	336.24	0.00	0.00	0.00
6.00	0.00	0	336.24	0.00	0.00	0.00
8.00	0.00	0	336.24	0.00	0.00	0.00
10.00	0.00	0	336.24	0.00	0.00	0.00
12.00	0.01	12	336.27	0.00	0.00	0.00
14.00	0.02	28	336.30	0.01	0.01	0.00
16.00	0.03	42	336.33	0.03	0.03	0.00
18.00	**0.08**	**81**	**336.42**	**0.06**	**0.06**	0.00
20.00	**0.04**	**54**	**336.36**	**0.04**	**0.04**	0.00
22.00	0.03	48	336.35	0.03	0.03	0.00
24.00	0.03	48	336.35	0.03	0.03	0.00
26.00	0.00	5	336.25	0.00	0.00	0.00
28.00	0.00	3	336.25	0.00	0.00	0.00
30.00	0.00	2	336.24	0.00	0.00	0.00
32.00	0.00	1	336.24	0.00	0.00	0.00
34.00	0.00	1	336.24	0.00	0.00	0.00
36.00	0.00	0	336.24	0.00	0.00	0.00
38.00	0.00	0	336.24	0.00	0.00	0.00
40.00	0.00	0	336.24	0.00	0.00	0.00
42.00	0.00	0	336.24	0.00	0.00	0.00
44.00	0.00	0	336.24	0.00	0.00	0.00
46.00	0.00	0	336.24	0.00	0.00	0.00
48.00	0.00	0	336.24	0.00	0.00	0.00
50.00	0.00	0	336.24	0.00	0.00	0.00
52.00	0.00	0	336.24	0.00	0.00	0.00
54.00	0.00	0	336.24	0.00	0.00	0.00
56.00	0.00	0	336.24	0.00	0.00	0.00
58.00	0.00	0	336.24	0.00	0.00	0.00
60.00	0.00	0	336.24	0.00	0.00	0.00
62.00	0.00	0	336.24	0.00	0.00	0.00
64.00	0.00	0	336.24	0.00	0.00	0.00
66.00	0.00	0	336.24	0.00	0.00	0.00
68.00	0.00	0	336.24	0.00	0.00	0.00
70.00	0.00	0	336.24	0.00	0.00	0.00
72.00	0.00	0	336.24	0.00	0.00	0.00
74.00	0.00	0	336.24	0.00	0.00	0.00
76.00	0.00	0	336.24	0.00	0.00	0.00
78.00	0.00	0	336.24	0.00	0.00	0.00
80.00	0.00	0	336.24	0.00	0.00	0.00
82.00	0.00	0	336.24	0.00	0.00	0.00
84.00	0.00	0	336.24	0.00	0.00	0.00
86.00	0.00	0	336.24	0.00	0.00	0.00

DMA No. 24 & 25 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.24	0.00	0.00	**0.00**
2.00	0.00	0	336.24	0.00	0.00	0.00
4.00	0.00	0	336.24	0.00	0.00	0.00
6.00	0.09	98	336.45	0.08	0.08	0.00
8.00	0.13	168	336.61	0.11	0.11	0.00
10.00	0.15	273	336.84	0.15	0.15	0.00
12.00	0.18	317	336.93	0.16	0.16	0.00
14.00	0.29	526	337.39	0.22	0.22	0.00
16.00	0.37	841	338.08	0.28	0.28	0.00
18.00	**0.70**	**1,851**	**339.46**	**0.37**	**0.37**	0.00
20.00	**0.29**	**2,111**	**339.73**	**0.39**	**0.39**	0.00
22.00	0.24	1,348	338.86	0.33	0.33	0.00
24.00	0.22	815	338.03	0.27	0.27	0.00
26.00	0.00	22	336.29	0.01	0.01	0.00
28.00	0.00	4	336.25	0.00	0.00	0.00
30.00	0.00	2	336.25	0.00	0.00	0.00
32.00	0.00	1	336.24	0.00	0.00	0.00
34.00	0.00	1	336.24	0.00	0.00	0.00
36.00	0.00	0	336.24	0.00	0.00	0.00
38.00	0.00	0	336.24	0.00	0.00	0.00
40.00	0.00	0	336.24	0.00	0.00	0.00
42.00	0.00	0	336.24	0.00	0.00	0.00
44.00	0.00	0	336.24	0.00	0.00	0.00
46.00	0.00	0	336.24	0.00	0.00	0.00
48.00	0.00	0	336.24	0.00	0.00	0.00
50.00	0.00	0	336.24	0.00	0.00	0.00
52.00	0.00	0	336.24	0.00	0.00	0.00
54.00	0.00	0	336.24	0.00	0.00	0.00
56.00	0.00	0	336.24	0.00	0.00	0.00
58.00	0.00	0	336.24	0.00	0.00	0.00
60.00	0.00	0	336.24	0.00	0.00	0.00
62.00	0.00	0	336.24	0.00	0.00	0.00
64.00	0.00	0	336.24	0.00	0.00	0.00
66.00	0.00	0	336.24	0.00	0.00	0.00
68.00	0.00	0	336.24	0.00	0.00	0.00
70.00	0.00	0	336.24	0.00	0.00	0.00
72.00	0.00	0	336.24	0.00	0.00	0.00
74.00	0.00	0	336.24	0.00	0.00	0.00
76.00	0.00	0	336.24	0.00	0.00	0.00
78.00	0.00	0	336.24	0.00	0.00	0.00
80.00	0.00	0	336.24	0.00	0.00	0.00
82.00	0.00	0	336.24	0.00	0.00	0.00
84.00	0.00	0	336.24	0.00	0.00	0.00
86.00	0.00	0	336.24	0.00	0.00	0.00

DMA No. 26 & 27 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.24	0.00	0.00	**0.00**
2.00	0.00	0	337.24	0.00	0.00	0.00
4.00	0.00	0	337.24	0.00	0.00	0.00
6.00	0.00	0	337.24	0.00	0.00	0.00
8.00	0.00	0	337.24	0.00	0.00	0.00
10.00	0.00	2	337.24	0.00	0.00	0.00
12.00	0.01	19	337.27	0.01	0.01	0.00
14.00	0.02	39	337.31	0.02	0.02	0.00
16.00	0.04	55	337.34	0.03	0.03	0.00
18.00	**0.09**	**105**	**337.43**	**0.07**	**0.07**	0.00
20.00	**0.04**	**73**	**337.37**	**0.05**	**0.05**	0.00
22.00	0.04	63	337.35	0.04	0.04	0.00
24.00	0.04	63	337.35	0.04	0.04	0.00
26.00	0.00	9	337.26	0.00	0.00	0.00
28.00	0.00	4	337.25	0.00	0.00	0.00
30.00	0.00	3	337.24	0.00	0.00	0.00
32.00	0.00	2	337.24	0.00	0.00	0.00
34.00	0.00	1	337.24	0.00	0.00	0.00
36.00	0.00	1	337.24	0.00	0.00	0.00
38.00	0.00	0	337.24	0.00	0.00	0.00
40.00	0.00	0	337.24	0.00	0.00	0.00
42.00	0.00	0	337.24	0.00	0.00	0.00
44.00	0.00	0	337.24	0.00	0.00	0.00
46.00	0.00	0	337.24	0.00	0.00	0.00
48.00	0.00	0	337.24	0.00	0.00	0.00
50.00	0.00	0	337.24	0.00	0.00	0.00
52.00	0.00	0	337.24	0.00	0.00	0.00
54.00	0.00	0	337.24	0.00	0.00	0.00
56.00	0.00	0	337.24	0.00	0.00	0.00
58.00	0.00	0	337.24	0.00	0.00	0.00
60.00	0.00	0	337.24	0.00	0.00	0.00
62.00	0.00	0	337.24	0.00	0.00	0.00
64.00	0.00	0	337.24	0.00	0.00	0.00
66.00	0.00	0	337.24	0.00	0.00	0.00
68.00	0.00	0	337.24	0.00	0.00	0.00
70.00	0.00	0	337.24	0.00	0.00	0.00
72.00	0.00	0	337.24	0.00	0.00	0.00
74.00	0.00	0	337.24	0.00	0.00	0.00
76.00	0.00	0	337.24	0.00	0.00	0.00
78.00	0.00	0	337.24	0.00	0.00	0.00
80.00	0.00	0	337.24	0.00	0.00	0.00
82.00	0.00	0	337.24	0.00	0.00	0.00
84.00	0.00	0	337.24	0.00	0.00	0.00
86.00	0.00	0	337.24	0.00	0.00	0.00

DMA No. 26 & 27 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	337.24	0.00	0.00	**0.00**
2.00	0.00	0	337.24	0.00	0.00	0.00
4.00	0.01	2	337.24	0.00	0.00	0.00
6.00	0.10	133	337.48	0.08	0.08	0.00
8.00	0.14	227	337.65	0.12	0.12	0.00
10.00	0.17	370	337.91	0.16	0.16	0.00
12.00	0.19	428	338.02	0.17	0.17	0.00
14.00	0.31	679	338.47	0.22	0.22	0.00
16.00	0.39	1,078	339.19	0.29	0.29	0.00
18.00	**0.74**	**1,233**	**340.10**	**0.74**	**0.74**	0.00
20.00	**0.30**	**1,113**	**339.30**	**0.31**	**0.31**	0.00
22.00	0.25	992	339.04	0.28	0.28	0.00
24.00	0.24	849	338.78	0.25	0.25	0.00
26.00	0.00	39	337.31	0.02	0.02	0.00
28.00	0.00	7	337.25	0.00	0.00	0.00
30.00	0.00	4	337.25	0.00	0.00	0.00
32.00	0.00	2	337.24	0.00	0.00	0.00
34.00	0.00	2	337.24	0.00	0.00	0.00
36.00	0.00	1	337.24	0.00	0.00	0.00
38.00	0.00	1	337.24	0.00	0.00	0.00
40.00	0.00	0	337.24	0.00	0.00	0.00
42.00	0.00	0	337.24	0.00	0.00	0.00
44.00	0.00	0	337.24	0.00	0.00	0.00
46.00	0.00	0	337.24	0.00	0.00	0.00
48.00	0.00	0	337.24	0.00	0.00	0.00
50.00	0.00	0	337.24	0.00	0.00	0.00
52.00	0.00	0	337.24	0.00	0.00	0.00
54.00	0.00	0	337.24	0.00	0.00	0.00
56.00	0.00	0	337.24	0.00	0.00	0.00
58.00	0.00	0	337.24	0.00	0.00	0.00
60.00	0.00	0	337.24	0.00	0.00	0.00
62.00	0.00	0	337.24	0.00	0.00	0.00
64.00	0.00	0	337.24	0.00	0.00	0.00
66.00	0.00	0	337.24	0.00	0.00	0.00
68.00	0.00	0	337.24	0.00	0.00	0.00
70.00	0.00	0	337.24	0.00	0.00	0.00
72.00	0.00	0	337.24	0.00	0.00	0.00
74.00	0.00	0	337.24	0.00	0.00	0.00
76.00	0.00	0	337.24	0.00	0.00	0.00
78.00	0.00	0	337.24	0.00	0.00	0.00
80.00	0.00	0	337.24	0.00	0.00	0.00
82.00	0.00	0	337.24	0.00	0.00	0.00
84.00	0.00	0	337.24	0.00	0.00	0.00
86.00	0.00	0	337.24	0.00	0.00	0.00

DMA No. 28 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.73	0.00	0.00	**0.00**
2.00	0.00	0	335.73	0.00	0.00	0.00
4.00	0.00	0	335.73	0.00	0.00	0.00
6.00	0.00	3	335.73	0.00	0.00	0.00
8.00	0.02	56	335.78	0.00	0.00	0.00
10.00	0.02	126	335.84	0.02	0.02	0.00
12.00	0.03	167	335.88	0.03	0.03	0.00
14.00	0.06	239	335.94	0.04	0.04	0.00
16.00	0.08	359	336.05	0.05	0.05	0.00
18.00	**0.17**	**672**	**336.32**	**0.07**	**0.07**	0.00
20.00	**0.07**	**833**	**336.46**	**0.08**	**0.08**	0.00
22.00	0.06	693	336.34	0.08	0.08	0.00
24.00	0.05	578	336.24	0.07	0.07	0.00
26.00	0.00	227	335.93	0.04	0.04	0.00
28.00	0.00	83	335.80	0.01	0.01	0.00
30.00	0.00	45	335.77	0.00	0.00	0.00
32.00	0.00	27	335.75	0.00	0.00	0.00
34.00	0.00	18	335.75	0.00	0.00	0.00
36.00	0.00	14	335.74	0.00	0.00	0.00
38.00	0.00	12	335.74	0.00	0.00	0.00
40.00	0.00	10	335.74	0.00	0.00	0.00
42.00	0.00	9	335.74	0.00	0.00	0.00
44.00	0.00	8	335.74	0.00	0.00	0.00
46.00	0.00	7	335.74	0.00	0.00	0.00
48.00	0.00	6	335.74	0.00	0.00	0.00
50.00	0.00	6	335.74	0.00	0.00	0.00
52.00	0.00	5	335.73	0.00	0.00	0.00
54.00	0.00	5	335.73	0.00	0.00	0.00
56.00	0.00	4	335.73	0.00	0.00	0.00
58.00	0.00	4	335.73	0.00	0.00	0.00
60.00	0.00	3	335.73	0.00	0.00	0.00
62.00	0.00	3	335.73	0.00	0.00	0.00
64.00	0.00	3	335.73	0.00	0.00	0.00
66.00	0.00	2	335.73	0.00	0.00	0.00
68.00	0.00	2	335.73	0.00	0.00	0.00
70.00	0.00	2	335.73	0.00	0.00	0.00
72.00	0.00	2	335.73	0.00	0.00	0.00
74.00	0.00	1	335.73	0.00	0.00	0.00
76.00	0.00	1	335.73	0.00	0.00	0.00
78.00	0.00	1	335.73	0.00	0.00	0.00
80.00	0.00	1	335.73	0.00	0.00	0.00
82.00	0.00	1	335.73	0.00	0.00	0.00
84.00	0.00	1	335.73	0.00	0.00	0.00
86.00	0.00	1	335.73	0.00	0.00	0.00

DMA No. 28 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.73	0.00	0.00	**0.00**
2.00	0.00	0	335.73	0.00	0.00	0.00
4.00	0.09	184	335.89	0.03	0.03	0.00
6.00	0.20	917	336.53	0.09	0.09	0.00
8.00	0.24	1,355	336.92	0.17	0.17	0.00
10.00	0.24	1,735	337.25	0.21	0.21	0.00
12.00	0.26	1,894	337.39	0.23	0.23	0.00
14.00	0.41	2,345	337.96	0.28	0.28	0.00
16.00	0.49	2,774	339.46	0.38	0.38	0.00
18.00	**0.91**	**4,071**	**340.12**	**0.66**	**0.66**	0.00
20.00	**0.35**	**3,646**	**340.00**	**0.41**	**0.41**	0.00
22.00	0.28	2,963	339.78	0.40	0.40	0.00
24.00	0.27	2,443	338.30	0.30	0.30	0.00
26.00	0.00	1,081	336.68	0.13	0.13	0.00
28.00	0.00	487	336.16	0.06	0.06	0.00
30.00	0.00	170	335.88	0.03	0.03	0.00
32.00	0.00	70	335.79	0.01	0.01	0.00
34.00	0.00	39	335.76	0.00	0.00	0.00
36.00	0.00	24	335.75	0.00	0.00	0.00
38.00	0.00	16	335.74	0.00	0.00	0.00
40.00	0.00	13	335.74	0.00	0.00	0.00
42.00	0.00	11	335.74	0.00	0.00	0.00
44.00	0.00	10	335.74	0.00	0.00	0.00
46.00	0.00	9	335.74	0.00	0.00	0.00
48.00	0.00	8	335.74	0.00	0.00	0.00
50.00	0.00	7	335.74	0.00	0.00	0.00
52.00	0.00	6	335.74	0.00	0.00	0.00
54.00	0.00	6	335.73	0.00	0.00	0.00
56.00	0.00	5	335.73	0.00	0.00	0.00
58.00	0.00	4	335.73	0.00	0.00	0.00
60.00	0.00	4	335.73	0.00	0.00	0.00
62.00	0.00	4	335.73	0.00	0.00	0.00
64.00	0.00	3	335.73	0.00	0.00	0.00
66.00	0.00	3	335.73	0.00	0.00	0.00
68.00	0.00	3	335.73	0.00	0.00	0.00
70.00	0.00	2	335.73	0.00	0.00	0.00
72.00	0.00	2	335.73	0.00	0.00	0.00
74.00	0.00	2	335.73	0.00	0.00	0.00
76.00	0.00	2	335.73	0.00	0.00	0.00
78.00	0.00	1	335.73	0.00	0.00	0.00
80.00	0.00	1	335.73	0.00	0.00	0.00
82.00	0.00	1	335.73	0.00	0.00	0.00
84.00	0.00	1	335.73	0.00	0.00	0.00
86.00	0.00	1	335.73	0.00	0.00	0.00

DMA No. 29 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.73	0.00	0.00	**0.00**
2.00	0.00	0	336.73	0.00	0.00	0.00
4.00	0.00	0	336.73	0.00	0.00	0.00
6.00	0.00	0	336.73	0.00	0.00	0.00
8.00	0.00	7	336.75	0.00	0.00	0.00
10.00	0.01	14	336.77	0.00	0.00	0.00
12.00	0.01	18	336.78	0.01	0.01	0.00
14.00	0.01	27	336.81	0.01	0.01	0.00
16.00	0.02	39	336.84	0.01	0.01	0.00
18.00	**0.04**	**77**	**336.96**	**0.02**	**0.02**	0.00
20.00	**0.02**	**84**	**336.98**	**0.02**	**0.02**	0.00
22.00	0.01	48	336.87	0.02	0.02	0.00
24.00	0.01	38	336.84	0.01	0.01	0.00
26.00	0.00	6	336.75	0.00	0.00	0.00
28.00	0.00	3	336.74	0.00	0.00	0.00
30.00	0.00	2	336.73	0.00	0.00	0.00
32.00	0.00	1	336.73	0.00	0.00	0.00
34.00	0.00	1	336.73	0.00	0.00	0.00
36.00	0.00	0	336.73	0.00	0.00	0.00
38.00	0.00	0	336.73	0.00	0.00	0.00
40.00	0.00	0	336.73	0.00	0.00	0.00
42.00	0.00	0	336.73	0.00	0.00	0.00
44.00	0.00	0	336.73	0.00	0.00	0.00
46.00	0.00	0	336.73	0.00	0.00	0.00
48.00	0.00	0	336.73	0.00	0.00	0.00
50.00	0.00	0	336.73	0.00	0.00	0.00
52.00	0.00	0	336.73	0.00	0.00	0.00
54.00	0.00	0	336.73	0.00	0.00	0.00
56.00	0.00	0	336.73	0.00	0.00	0.00
58.00	0.00	0	336.73	0.00	0.00	0.00
60.00	0.00	0	336.73	0.00	0.00	0.00
62.00	0.00	0	336.73	0.00	0.00	0.00
64.00	0.00	0	336.73	0.00	0.00	0.00
66.00	0.00	0	336.73	0.00	0.00	0.00
68.00	0.00	0	336.73	0.00	0.00	0.00
70.00	0.00	0	336.73	0.00	0.00	0.00
72.00	0.00	0	336.73	0.00	0.00	0.00
74.00	0.00	0	336.73	0.00	0.00	0.00
76.00	0.00	0	336.73	0.00	0.00	0.00
78.00	0.00	0	336.73	0.00	0.00	0.00
80.00	0.00	0	336.73	0.00	0.00	0.00
82.00	0.00	0	336.73	0.00	0.00	0.00
84.00	0.00	0	336.73	0.00	0.00	0.00
86.00	0.00	0	336.73	0.00	0.00	0.00

DMA No. 29 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.73	0.00	0.00	**0.00**
2.00	0.00	0	336.73	0.00	0.00	0.00
4.00	0.02	23	336.80	0.01	0.01	0.00
6.00	0.05	130	337.11	0.03	0.03	0.00
8.00	0.05	213	337.36	0.04	0.04	0.00
10.00	0.06	290	337.58	0.06	0.06	0.00
12.00	0.06	294	337.60	0.06	0.06	0.00
14.00	0.09	342	337.74	0.07	0.07	0.00
16.00	0.11	419	337.96	0.09	0.09	0.00
18.00	**0.21**	**662**	**338.68**	**0.13**	**0.13**	0.00
20.00	**0.09**	**625**	**338.57**	**0.12**	**0.12**	0.00
22.00	0.07	416	337.95	0.09	0.09	0.00
24.00	0.07	334	337.71	0.07	0.07	0.00
26.00	0.00	91	337.00	0.02	0.02	0.00
28.00	0.00	9	336.76	0.00	0.00	0.00
30.00	0.00	3	336.74	0.00	0.00	0.00
32.00	0.00	2	336.74	0.00	0.00	0.00
34.00	0.00	1	336.73	0.00	0.00	0.00
36.00	0.00	1	336.73	0.00	0.00	0.00
38.00	0.00	0	336.73	0.00	0.00	0.00
40.00	0.00	0	336.73	0.00	0.00	0.00
42.00	0.00	0	336.73	0.00	0.00	0.00
44.00	0.00	0	336.73	0.00	0.00	0.00
46.00	0.00	0	336.73	0.00	0.00	0.00
48.00	0.00	0	336.73	0.00	0.00	0.00
50.00	0.00	0	336.73	0.00	0.00	0.00
52.00	0.00	0	336.73	0.00	0.00	0.00
54.00	0.00	0	336.73	0.00	0.00	0.00
56.00	0.00	0	336.73	0.00	0.00	0.00
58.00	0.00	0	336.73	0.00	0.00	0.00
60.00	0.00	0	336.73	0.00	0.00	0.00
62.00	0.00	0	336.73	0.00	0.00	0.00
64.00	0.00	0	336.73	0.00	0.00	0.00
66.00	0.00	0	336.73	0.00	0.00	0.00
68.00	0.00	0	336.73	0.00	0.00	0.00
70.00	0.00	0	336.73	0.00	0.00	0.00
72.00	0.00	0	336.73	0.00	0.00	0.00
74.00	0.00	0	336.73	0.00	0.00	0.00
76.00	0.00	0	336.73	0.00	0.00	0.00
78.00	0.00	0	336.73	0.00	0.00	0.00
80.00	0.00	0	336.73	0.00	0.00	0.00
82.00	0.00	0	336.73	0.00	0.00	0.00
84.00	0.00	0	336.73	0.00	0.00	0.00
86.00	0.00	0	336.73	0.00	0.00	0.00

DMA No. 30 95% event Drawdown time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.71	0.00	0.00	**0.00**
2.00	0.00	0	336.71	0.00	0.00	0.00
4.00	0.00	0	336.71	0.00	0.00	0.00
6.00	0.00	0	336.71	0.00	0.00	0.00
8.00	0.00	11	336.74	0.00	0.00	0.00
10.00	0.01	22	336.77	0.00	0.00	0.00
12.00	0.01	26	336.78	0.01	0.01	0.00
14.00	0.01	34	336.80	0.01	0.01	0.00
16.00	0.02	43	336.82	0.02	0.02	0.00
18.00	**0.04**	**78**	**336.92**	**0.03**	**0.03**	0.00
20.00	**0.02**	**58**	**336.86**	**0.02**	**0.02**	0.00
22.00	0.01	40	336.82	0.02	0.02	0.00
24.00	0.01	38	336.81	0.01	0.01	0.00
26.00	0.00	10	336.74	0.00	0.00	0.00
28.00	0.00	8	336.73	0.00	0.00	0.00
30.00	0.00	8	336.73	0.00	0.00	0.00
32.00	0.00	8	336.73	0.00	0.00	0.00
34.00	0.00	8	336.73	0.00	0.00	0.00
36.00	0.00	8	336.73	0.00	0.00	0.00
38.00	0.00	8	336.73	0.00	0.00	0.00
40.00	0.00	8	336.73	0.00	0.00	0.00
42.00	0.00	8	336.73	0.00	0.00	0.00
44.00	0.00	8	336.73	0.00	0.00	0.00
46.00	0.00	8	336.73	0.00	0.00	0.00
48.00	0.00	8	336.73	0.00	0.00	0.00
50.00	0.00	8	336.73	0.00	0.00	0.00
52.00	0.00	8	336.73	0.00	0.00	0.00
54.00	0.00	8	336.73	0.00	0.00	0.00
56.00	0.00	8	336.73	0.00	0.00	0.00
58.00	0.00	8	336.73	0.00	0.00	0.00
60.00	0.00	8	336.73	0.00	0.00	0.00
62.00	0.00	8	336.73	0.00	0.00	0.00
64.00	0.00	8	336.73	0.00	0.00	0.00
66.00	0.00	8	336.73	0.00	0.00	0.00
68.00	0.00	8	336.73	0.00	0.00	0.00
70.00	0.00	8	336.73	0.00	0.00	0.00
72.00	0.00	8	336.73	0.00	0.00	0.00
74.00	0.00	8	336.73	0.00	0.00	0.00
76.00	0.00	8	336.73	0.00	0.00	0.00
78.00	0.00	8	336.73	0.00	0.00	0.00
80.00	0.00	8	336.73	0.00	0.00	0.00
82.00	0.00	8	336.73	0.00	0.00	0.00
84.00	0.00	8	336.73	0.00	0.00	0.00
86.00	0.00	8	336.73	0.00	0.00	0.00

DMA No. 30 100 year event Drawdown Time

Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	336.71	0.00	0.00	**0.00**
2.00	0.00	0	336.71	0.00	0.00	0.00
4.00	0.02	34	336.80	0.01	0.01	0.00
6.00	0.05	126	337.04	0.04	0.04	0.00
8.00	0.06	178	337.18	0.05	0.05	0.00
10.00	0.06	247	337.36	0.06	0.06	0.00
12.00	0.07	269	337.42	0.06	0.06	0.00
14.00	0.11	344	337.62	0.09	0.09	0.00
16.00	0.13	386	337.72	0.11	0.11	0.00
18.00	**0.25**	**607**	**338.31**	**0.17**	**0.17**	0.00
20.00	**0.09**	**481**	**337.98**	**0.14**	**0.14**	0.00
22.00	0.08	326	337.57	0.08	0.08	0.00
24.00	0.07	314	337.54	0.07	0.07	0.00
26.00	0.00	37	336.81	0.01	0.01	0.00
28.00	0.00	10	336.74	0.00	0.00	0.00
30.00	0.00	8	336.73	0.00	0.00	0.00
32.00	0.00	8	336.73	0.00	0.00	0.00
34.00	0.00	8	336.73	0.00	0.00	0.00
36.00	0.00	8	336.73	0.00	0.00	0.00
38.00	0.00	8	336.73	0.00	0.00	0.00
40.00	0.00	8	336.73	0.00	0.00	0.00
42.00	0.00	8	336.73	0.00	0.00	0.00
44.00	0.00	8	336.73	0.00	0.00	0.00
46.00	0.00	8	336.73	0.00	0.00	0.00
48.00	0.00	8	336.73	0.00	0.00	0.00
50.00	0.00	8	336.73	0.00	0.00	0.00
52.00	0.00	8	336.73	0.00	0.00	0.00
54.00	0.00	8	336.73	0.00	0.00	0.00
56.00	0.00	8	336.73	0.00	0.00	0.00
58.00	0.00	8	336.73	0.00	0.00	0.00
60.00	0.00	8	336.73	0.00	0.00	0.00
62.00	0.00	8	336.73	0.00	0.00	0.00
64.00	0.00	8	336.73	0.00	0.00	0.00
66.00	0.00	8	336.73	0.00	0.00	0.00
68.00	0.00	8	336.73	0.00	0.00	0.00
70.00	0.00	8	336.73	0.00	0.00	0.00
72.00	0.00	8	336.73	0.00	0.00	0.00
74.00	0.00	8	336.73	0.00	0.00	0.00
76.00	0.00	8	336.73	0.00	0.00	0.00
78.00	0.00	8	336.73	0.00	0.00	0.00
80.00	0.00	8	336.73	0.00	0.00	0.00
82.00	0.00	8	336.73	0.00	0.00	0.00
84.00	0.00	8	336.73	0.00	0.00	0.00
86.00	0.00	8	336.73	0.00	0.00	0.00

Outfall discharge Calculations

Total Pre-development

Events for Subcatchment 1S: Project Pre Development

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	1.96	0.848	0.64
1 year	2.21	2.63	1.188	0.90
2 year	2.90	3.99	1.902	1.43
5 year	3.84	5.87	2.958	2.23
10 year	4.62	7.44	3.879	2.92
25 year	5.72	9.65	5.219	3.94
50 year	6.59	11.39	6.301	4.75
100 year	**7.49**	**13.19**	**7.435**	**5.61**

Total Post Development

Events for Subcatchment 2S: DMA 1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
95%	1.85	1.49	0.580	0.44
1 year	2.21	2.12	0.861	0.65
2 year	2.90	3.43	1.480	1.12
5 year	3.84	5.31	2.433	1.83
10 year	4.62	6.92	3.286	2.48
25 year	5.72	9.20	4.550	3.43
50 year	6.59	11.00	5.584	4.21
100 year	**7.49**	**12.87**	**6.677**	**5.03**

Events for Pond 3P: Bioretention Pond

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
95%	1.49	1.19	1.19	**0.00**	335.92	1,016
1 year	2.12	1.66	1.66	0.00	336.04	2,335
2 year	3.43	2.79	2.79	0.00	336.27	5,027
5 year	5.31	4.41	4.41	0.00	336.57	8,551
10 year	6.92	5.71	5.71	0.00	336.83	11,537
25 year	9.20	6.84	6.84	0.00	337.29	17,007
50 year	11.00	7.09	7.09	0.00	338.29	24,573
100 year	**12.87**	**8.11**	**8.11**	0.00	**339.93**	**31,768**

Printable Title

Printable Subtitle

Set units: m mm ft in [Hide this line]

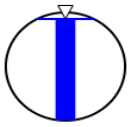
Inputs

Pipe diameter, d_0	1.5	ft	X
Manning roughness, n	0.011		X
Pressure slope (possibly ? equal to pipe slope), S_0	0.0035	rise/run	X
Percent of (or ratio to) full depth (100% or 1 if flowing full)	94	%	X

Results

Flow, Q (See notes)	7.8996	cfs	X
Velocity, v	4.5826	ft/sec	X
Velocity head, h_v	0.3264	ft H2O	X
Flow area	1.7239	ft^2	X
Wetted perimeter	3.9700	ft	X
Hydraulic radius	0.4342	ft	X
Top width, T	0.7125	ft	X
Froude number, F	0.52		X
Average shear stress (tractive force), tau	0.0949	psf	X

Printable version (reload/refresh to restore)



The 18" Storm drain pipe is good to handle up to
50 year storm event at 7.09 cfs < pipe capacity 7.9 cfs Ok.

Summary for Subcatchment 2S: DMA 1

Runoff = 12.87 cfs @ 18.14 hrs, Volume= 6.677 af, Depth= 5.03"
Routed to Pond 3P : Bioretention Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
693,210	79	1 acre lots, 20% imp, HSG C
554,568		80.00% Pervious Area
138,642		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Subcatchment 1S: Project Pre Development

Runoff = 13.59 cfs @ 18.14 hrs, Volume= 7.435 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=7.49"

Area (sf)	CN	Description
693,210	84	50-75% Grass cover, Fair, HSG D
693,210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Direct**

Summary for Pond 3P: Bioretention Pond

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 15.914 ac, 20.00% Impervious, Inflow Depth = 5.03" for 100 year event
Inflow = 12.87 cfs @ 18.14 hrs, Volume= 6.677 af
Outflow = 8.11 cfs @ 18.80 hrs, Volume= 6.677 af, Atten= 37%, Lag= 39.4 min
Primary = 8.11 cfs @ 18.80 hrs, Volume= 6.677 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 339.93' @ 18.80 hrs Surf.Area= 29,343 sf Storage= 31,768 cf

Plug-Flow detention time= 38.2 min calculated for 6.677 af (100% of inflow)
Center-of-Mass det. time= 38.2 min (1,012.4 - 974.1)

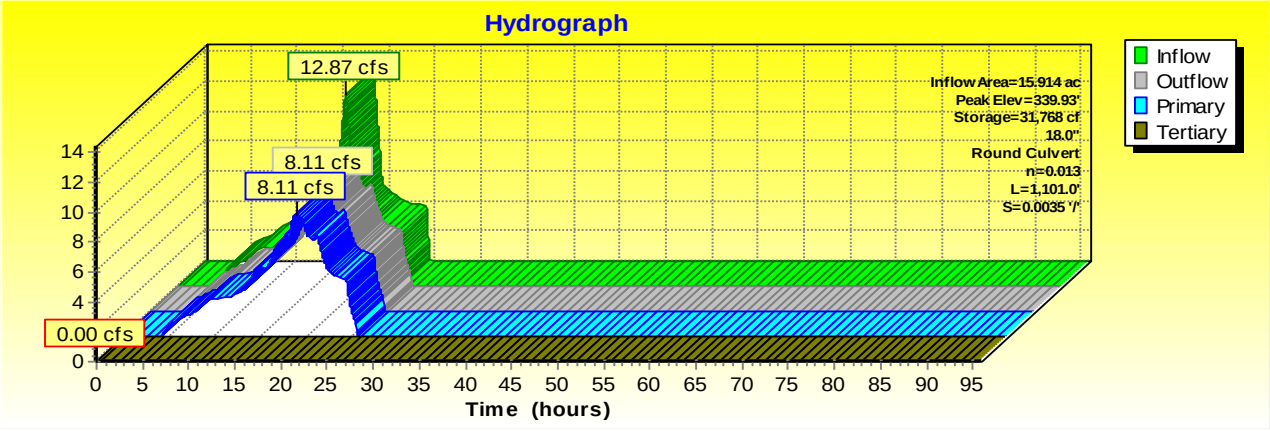
Volume	Invert	Avail.Storage	Storage Description
#1	335.83'	74,989 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
335.83	0	0.0	0	0
335.84	29,130	40.0	58	58
337.83	29,130	40.0	23,187	23,246
337.84	29,130	10.0	29	23,275
339.83	29,130	10.0	5,797	29,072
339.84	29,130	10.0	29	29,101
340.33	30,276	100.0	14,554	43,655
340.83	31,329	100.0	15,401	59,057
341.33	32,400	100.0	15,932	74,989

Device	Routing	Invert	Outlet Devices
#0	Tertiary	341.33'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	335.33'	**18.0" Round Culvert** L= 1,101.0' Ke= 0.200 Inlet / Outlet Invert= 335.33' / 331.45' S= 0.0035 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.11 cfs @ 18.80 hrs HW=339.93' (Free Discharge)
1=Culvert (Barrel Controls 8.11 cfs @ 4.59 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=335.83' (Free Discharge)

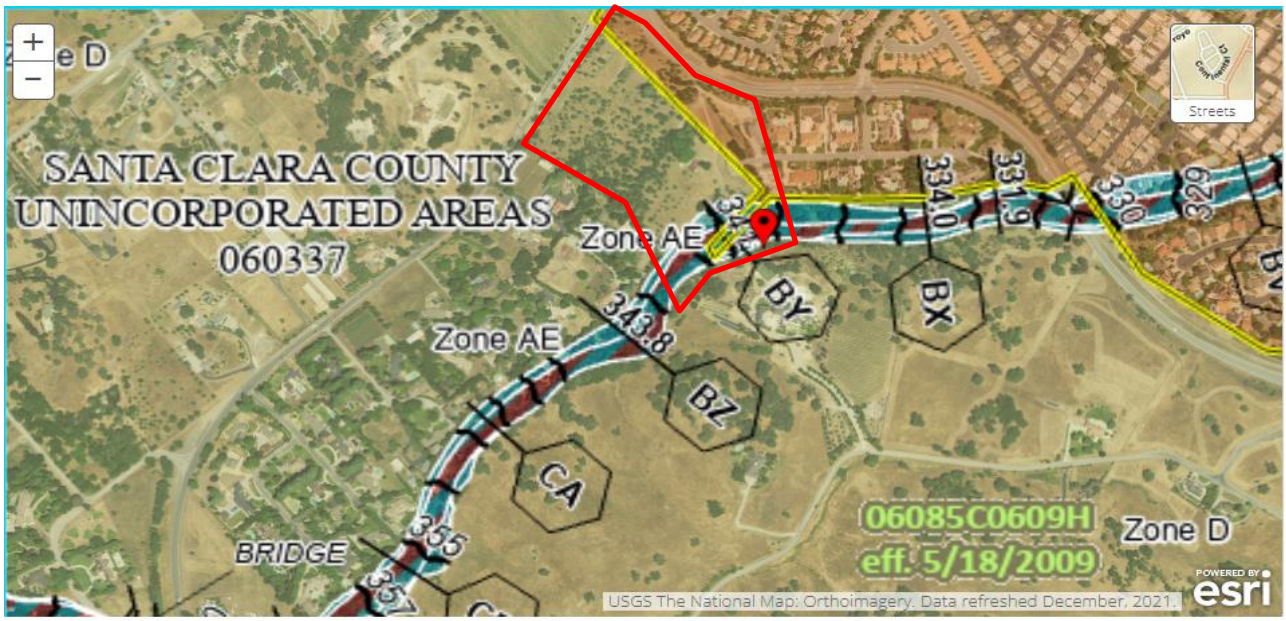


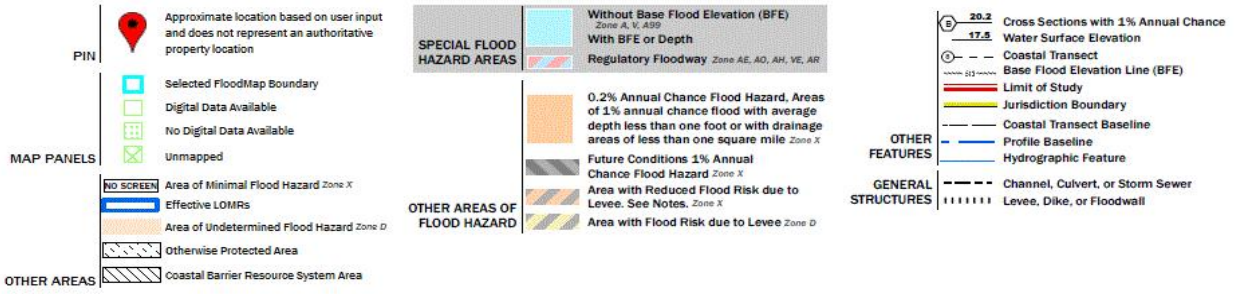
Drawdown timeduring 100 year storm

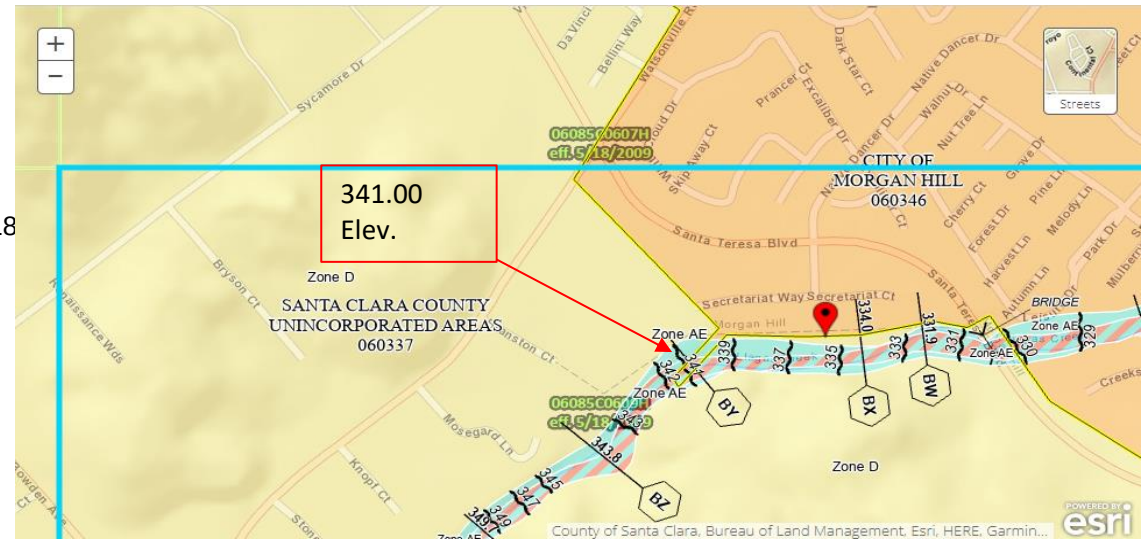
Hydrograph for Pond 3P: Bioretention Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Tertiary (cfs)
0.00	0.00	0	335.83	0.00	0.00	**0.00**
2.00	0.00	0	335.83	0.00	0.00	0.00
4.00	0.05	3	335.83	0.04	0.04	0.00
6.00	1.45	938	335.92	1.17	1.17	0.00
8.00	2.23	2,798	336.08	1.84	1.84	0.00
10.00	2.55	4,480	336.22	2.54	2.54	0.00
12.00	3.02	5,085	336.27	2.81	2.81	0.00
14.00	5.02	7,857	336.51	4.09	4.09	0.00
16.00	6.34	10,379	336.73	5.23	5.23	0.00
18.00	**12.22**	**22,378**	**337.76**	**6.73**	**6.73**	0.00
20.00	**4.73**	**22,499**	**337.77**	**6.74**	**6.74**	0.00
22.00	3.91	9,115	336.62	4.67	4.67	0.00
24.00	3.74	7,315	336.46	3.83	3.83	0.00
26.00	0.00	0	335.83	0.00	0.00	0.00
28.00	0.00	0	335.83	0.00	0.00	0.00
30.00	0.00	0	335.83	0.00	0.00	0.00
32.00	0.00	0	335.83	0.00	0.00	0.00
34.00	0.00	0	335.83	0.00	0.00	0.00
36.00	0.00	0	335.83	0.00	0.00	0.00
38.00	0.00	0	335.83	0.00	0.00	0.00
40.00	0.00	0	335.83	0.00	0.00	0.00
42.00	0.00	0	335.83	0.00	0.00	0.00
44.00	0.00	0	335.83	0.00	0.00	0.00
46.00	0.00	0	335.83	0.00	0.00	0.00
48.00	0.00	0	335.83	0.00	0.00	0.00
50.00	0.00	0	335.83	0.00	0.00	0.00
52.00	0.00	0	335.83	0.00	0.00	0.00
54.00	0.00	0	335.83	0.00	0.00	0.00
56.00	0.00	0	335.83	0.00	0.00	0.00
58.00	0.00	0	335.83	0.00	0.00	0.00
60.00	0.00	0	335.83	0.00	0.00	0.00
62.00	0.00	0	335.83	0.00	0.00	0.00
64.00	0.00	0	335.83	0.00	0.00	0.00
66.00	0.00	0	335.83	0.00	0.00	0.00
68.00	0.00	0	335.83	0.00	0.00	0.00
70.00	0.00	0	335.83	0.00	0.00	0.00
72.00	0.00	0	335.83	0.00	0.00	0.00
74.00	0.00	0	335.83	0.00	0.00	0.00
76.00	0.00	0	335.83	0.00	0.00	0.00
78.00	0.00	0	335.83	0.00	0.00	0.00
80.00	0.00	0	335.83	0.00	0.00	0.00
82.00	0.00	0	335.83	0.00	0.00	0.00
84.00	0.00	0	335.83	0.00	0.00	0.00
86.00	0.00	0	335.83	0.00	0.00	0.00
88.00	0.00	0	335.83	0.00	0.00	0.00
90.00	0.00	0	335.83	0.00	0.00	0.00
92.00	0.00	0	335.83	0.00	0.00	0.00
94.00	0.00	0	335.83	0.00	0.00	0.00
96.00	0.00	0	335.83	0.00	0.00	0.00

FEMA Map No. 06085C0609H
Eff. 5 18, 2009







18

The projected flood elevation falls at cross section BY at Elev. 341.00 Llagas Creek 100 yr. water elevation. All building pads are established at 343.85 being 2.85 feet above the 100 year flood event.

DMA No.	Bioswale Length	Bioswale Width
1	265	9
2	170	4
3	180	4
4	150	4
5	195	4
6	160	4
7	160	4
8	260	8.5
9	140	8.5
10	120	8.5
11	210	5
12	150	5
13	90	4
14	115	4
15	200	4
16	170	4
17	150	4
18	200	5
19	250	9
20	175	5
21	170	5
22	150	5
23	200	5
24	140	4
25	145	4
26	160	4
27	140	4
28	285	10
29	140	5
30	95	10

Appendix J

Noise Assessment Study

EDWARD L. PACK ASSOCIATES. INC.

1975 HAMILTON AVENUE
SUITE 26
MODESTO, CA 95125

Acoustical Consultants

TEL: 408-371-1195
FAX: 408-371-1196
www.packassociates.com

NOISE ASSESSMENT STUDY FOR THE PLANNED

"QUAIL VINEYARDS"

SINGLE-FAMILY DEVELOPMENT

WATSONVILLE ROAD, MORGAN HILL

Prepared for
Blackrock Homes

Prepared by
Jeffrey K. Pack

November 16, 2022
Project No. 54-057

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I. Executive Summary

This report presents the results of a noise assessment study for the planned single-family development at Watsonville Road and Santa Teresa Boulevard in Morgan Hill, as shown on the Site Development Plan, Ref. (a). The plans indicate that the project will have 14 single-family detached homes.

The noise exposure impacts to the project were evaluated against the standards of the City of Morgan Hill General Plan Safety, Services and Infrastructure Element Noise Chapter, Ref. (b), hereinafter referred to as the "Noise Element".

An analysis of the on-site noise measurements indicates that the noise environment is created primarily by traffic sources on Watsonville Road and Santa Teresa Boulevard. There are no other significant sources of noise in the vicinity of the site.

The results of this study reveal that the noise exposure excesses will occur at areas of the lots immediately adjacent to the roadways. However, exterior living areas may be designated outside of the acceptable noise exposure contour resulting in no impacts to the project with the exception of Lot 1. A noise control barrier will be necessary at Lot 1. The interior noise levels of the project will be within the limits of the standards of the City of Morgan Hill Noise Element. Noise mitigation measures for the interiors will not be required.

II. Background Information on Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing.

Most of the sounds which we hear in our normal environment do not consist of a single frequency, but rather a broad range of frequencies. As humans do not have perfect hearing, environmental sound measuring instruments have an electrical filter built in so that the instrument's detector replicates human hearing. This filter is called the "A-weighting" network and filters out low and very high frequencies. All environmental noise is reported in terms of A-weighted decibels, notated as “dBA”. All sound levels used in this report are A-weighted unless otherwise noted. Table I on page 3 shows the typical human response and noise sources for A-weighted noise levels.

Although the A-weighted noise level may adequately indicate the level of noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from distant sources that create a relatively steady background noise from which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_1, L_{10}, L_{50} and L_{90} are often used. They are the A-weighted noise levels exceeded for 1%, 10%, 50% and 90% of a stated time period. The continuous equivalent-energy level (L_{eq}) is that level of a steady state noise which has the same sound energy as a time-varying noise. It is often considered the average noise level and is used to calculate the Day-Night Levels (DNL) and the Community Noise Equivalent Level (CNEL) described below.

TABLE I

The A-Weighted Decibel Scale, Human Response, and Common Noise Sources

Noise Level, dBA	Human Response	Noise Source
120-150+	Painfully Loud	Sonic Boom (140 dBA)
100-120	Physical Discomfort	Motorcycle at 20 ft. (110 dBA) Nightclub Music (105 dBA)
70-100	Annoying	Diesel Pump at 100 ft. (95 dBA) Freight Train at 50 ft. (90 dBA) Food Blender (90 dBA) Jet Plane at 1000 ft. (85 dBA) Freeway at 50 ft. (80 dBA) Alarm Clock (80 dBA)
50-70	Intrusive	Average Traffic at 100 ft. (70 dBA) Pass. Car, 30 mph @ 25 ft. (65 dBA) Vacuum Cleaner (60 dBA) Suburban Background (55 dBA)
0-50	Quiet	Normal Conversation (50 dBA) Light Traffic at 100 ft. (45 dBA) Refrigerator (45 dBA) Desktop Computer (40 dBA) Whispering (35 dBA) Leaves Rustling (20 dBA) Threshold of Hearing (0 dBA)

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, the Day-Night Level (DNL) noise descriptor was developed. The DNL is also notated as L_{dn}. Either is acceptable, however, DNL is more popular worldwide. The DNL divides the 24-hour day into the daytime period of 7:00 a.m. to 10:00 p.m. and the nighttime period of 10:00 p.m. to 7:00 a.m. The nighttime noise levels are penalized by 10 dB to account for the greater sensitivity to noise at night. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes a 5 dB evening (7:00 p.m. - 10:00 p.m.) penalty and a 10 dB nighttime penalty. Both the DNL and the CNEL average the daytime, evening and nighttime noise levels over a 24-hour period to attain a single digit *noise exposure*. The proper notations for the Day-Night Level and the Community Noise Equivalent Level are dB DNL and dB CNEL, respectively, as they can only be calculated using A-weighted decibels. It is, therefore, considered redundant to notate dB(A) DNL or dB(A) CNEL.

The effects of noise on people can be listed in three general categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning, relaxing;
- physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants, airports, etc., can experience noise in the last category. Unfortunately, there is, as yet, no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily due to the wide variation in individual thresholds of annoyance and differing individual past experiences with noise. Thus, an important way to determine a person's subjective reaction to a new noise is to compare it to the existing environment to which one has adapted, i.e., the "ambient". In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the receivers.

With regard to increases in A-weighted noise levels, the Environmental Protection Agency has determined the following relationships that will be helpful in understanding this report.

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-perceptible difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

The adding or subtracting of sound levels is not simply arithmetic. The sound levels, in decibels, must be converted to Bels, the anti-logs of which are then calculated. The manipulation is then performed (arithmetic addition or subtraction), the logarithm of the sum or difference is calculated. The final number is then multiplied by 10 to convert Bels to decibels. The formula for adding decibels is as follows:

$$\text{Sum} = 10\log(10^{SL/10} + 10^{SL/10}) \qquad \text{where, SL is the Sound Level in decibels.}$$

For example, 60 dB + 60 dB = 63 dB, and 60 dB + 50 dB = 60 dB. Two sound sources of the same level are barely noisier than just one of the sources by itself. When one source is 10 dB higher than the other, the less noisy source does not add to the noisier source.

III. Noise Standards

A. City of Morgan Hill General Plan

The noise exposures presented herein were evaluated against the standards of the City of Morgan Hill Noise Element, which utilizes the Day-Night Level (DNL) 24-hour descriptor to define acceptable noise exposures for various land uses. The standards specify a limit of 60 dB DNL is specified for detached and attached single-family exterior living areas.

A limit of 45 dB DNL is specified for interior living spaces. In addition, the Noise Element specifies that when the exterior noise exposure at the building setback is greater than 60 dB DNL, the *maximum instantaneous* noise levels shall not exceed 50 dBA in bedrooms and 55 dBA in other living spaces. The exterior noise exposures at all lots of the project with the exception of Lot 1 are below 60 dB DNL under existing and projected future conditions. Thus, the interior maximum noise level limits are applicable only to the home on Lot 1.

IV. Acoustical Setting

A. Site, Traffic and Project Descriptions

The planned project site is located at the southwest quadrant of Watsonville Road and Santa Teresa Boulevard in Morgan Hill. The site is slopes down slightly from east to west near Santa Teresa Boulevard, but is relatively flat throughout the remainder of the site. The site is currently occupied by a single-family home and related out buildings. Most of the site is vacant. Surrounding land uses include single-family residential adjacent to the west and south, single-family residential across Watsonville Road to the north and single-family residential across Santa Teresa Boulevard to the east.

The primary sources of noise at the site are traffic on Watsonville Road and Santa Teresa Boulevard. Watsonville Road carries an existing Average Daily Traffic (ADT) volume of 12,500 vehicles. Santa Teresa Boulevard carries an existing ADT of 11,000 vehicles. The existing traffic volumes were determined from the noise measurement data, traffic data and roadway inspections. The most recent traffic count information was from 2015 which revealed that the traffic volume on Watsonville Road was 13,956 vehicles ADT, Ref. (c). No data on Santa Teresa Boulevard traffic was reported.

The planned project includes construction of 14 single-family detached homes. Ingress and egress to the site will be by way of a private street off of Watsonville Road to the west and an extension of Secretariat Way from the north. The Site Development Plan is shown on Figure 1 on page 8.

FIGURE 1 – Site Plan

V. Existing Noise Environment

A. Existing Noise Levels

To determine the existing noise environment at the site, continuous recordings of the sound levels were made at two locations. Location 1 was 69 ft. from the centerline of Watsonville Road. Location 2 was 120 ft. from the centerline of Santa Teresa Boulevard. These locations were chosen for security of the sound measuring instruments. The measurement locations are shown on Figure 2, below. The noise level measurements were made on October 19-20, 2022 for a continuous period of 24 hours and included measurements during the daytime and nighttime periods of the DNL index.

FIGURE 2 – Noise Measurement Location

The sound levels were recorded and processed using a Larson-Davis Model 831C Precision Integrating Sound Level Meter at Location 1 and a Larson Davis Model LxT Precision Integrating Sound Level Meter at Location 2. The meters yield, by direct readout, a series of descriptors of the sound levels versus time, which include the L_1, L_{10}, L_{50}, and L_{90}, i.e., those levels that are exceeded 1%, 10%, 50%, and 90% of the time. The meter also yields the maximum and minimum levels, and the continuous equivalent-energy levels (L_{eq}), which are used to calculate the DNL. The measured L_{eq}'s are shown in the data tables in Appendix C.

The L_{eq}'s at measurement Location 1, 69 ft. from the centerline of Watsonville Road, ranged from 56.8 to 63.8 dBA during the daytime and from 48.0 to 61.2 dBA at night.

The L_{eq}'s at measurement Location 2, 120 ft. from the centerline of Santa Teresa Boulevard, ranged from 51.4 to 58.7 dBA during the daytime and from 39.3 to 56.9 dBA at night.

B. Future Noise Levels

Future traffic volume data for Watsonville Road and Santa Teresa Boulevard were not available at the time of this study. The 2009 General Plan Circulation Element Traffic Impact Analysis, Ref. (d), reported a 2030 future traffic volume of 19,900 vehicles ADT for Watsonville Road. Santa Teresa Boulevard was not analyzed in that study. The 2015 traffic volume for Watsonville Road was 13,956 vehicles ADT. The annual average growth rate from 2015 (13,956 ADT) to projected 2030 (19,900 ADT) was calculated to be 2.4% per year. Applying a 2.4%/year growth rate to the 2022 volume of 12,500 vehicles and the future year 2042, the future traffic volume is expected to be 20,061 vehicles. This increase in traffic volume yields a 2 decibel increase over the existing traffic noise levels.

As traffic volume information for Santa Teresa Boulevard is not available, either historical or projected, we are assuming, for the purposes of this study, that the existing traffic volume of 11,000 vehicles ADT will also increase by 2.4% per year. For 2042 the traffic volume is expected to increase to 17,676 vehicles ADT. This increase in traffic volume also yields a 2 dB increase over the existing traffic noise levels.

Table II, below, provides the measured maximum noise levels at Location 1 along Watsonville Road, the calculated maximum noise levels at the setback of the home on Lot 1 and the calculated interior maximum noise levels. Note that maximum noise levels are not affected by vehicle volume.

TABLE II

Maximum Sound Levels, dBA

	Watsonville Rd		
		Exterior	Interior
	Measurement	House Setback	
TIME	66 ft.	100 ft.	100 ft.
7:00 AM	71.1	67.5	42.5
8:00 AM	70.2	66.6	41.6
9:00 AM	69.8	66.2	41.2
10:00 AM	69.0	65.4	40.4
11:00 AM	69.2	65.6	40.6
12:00 PM	69.1	65.5	40.5
1:00 PM	69.5	65.9	40.9
2:00 PM	69.5	65.9	40.9
3:00 PM	70.3	66.7	41.7
4:00 PM	70.2	66.6	41.6
5:00 PM	69.7	66.1	41.1
6:00 PM	70.1	66.5	41.5
7:00 PM	68.8	65.2	40.2
8:00 PM	68.4	64.8	39.8
9:00 PM	68.1	64.5	39.5
10:00 PM	67.0	63.4	38.4
11:00 PM	65.9	62.3	37.3
12:00 AM	63.9	60.3	35.3
1:00 AM	64.1	60.5	35.5
2:00 AM	62.5	58.9	33.9
3:00 AM	65.5	61.9	36.9
4:00 AM	68.8	65.2	40.2
5:00 AM	70.5	66.9	41.9
6:00 AM	70.5	66.9	41.9

VI. Noise Impacts to the Project

A. Exterior Noise Exposures

To determine the noise impacts to the project, the DNL's for the survey locations were calculated by decibel averaging of the L_{eq}'s as they apply to the daily time periods of the DNL index. A 10 decibel nighttime weighting factor was applied and the DNL was calculated using the formula shown in Appendix B. The measured L_{eq}'s and DNL calculations are shown in the data table in Appendix C. Adjustments were made to the measured noise levels to account for the variations in setback distances from the measurement locations using methods established by the Highway Research Board, Ref. (e).

Table III on page 13 provides the noise exposures at the measurement locations under existing traffic conditions, the existing and future noise exposures at the lot lines, building envelope lines and at the minimum building setbacks.

As shown in the table, the exterior noise exposures at all of the lot lines will exceed the 60 dB DNL limit of the City of Morgan Hill Noise Element. Likewise, the exterior noise exposures at all of the building envelope lines will exceed the 60 dB DNL limit of the City of Morgan Hill Noise Element. However, the noise exposures at all of the house setbacks, with the exception of Lot 1, will be within the 60 dB DNL limit of the City of Morgan Hill Noise Element.

The existing and future 60 dB DNL noise contours will be 110 ft. and 150 ft. from the centerline of Watsonville Road, respectively, and 88 ft. and 120 ft. from the centerline of Santa Teresa Boulevard, respectively.

In order the shield the entire lots from excessive traffic noise, noise control barriers ranging from 6 ft. to 8 ft. high would be required along the lot lines of the homes contiguous with both Watsonville Road and Santa Teresa Boulevard.

If the exterior living areas of the each home is restricted to building envelopes, noise control barriers 6 ft. high would be required along each lot's building envelope line contiguous with each roadway. These barriers would need to be continuous across each lot (drainage would need to be piped beneath the barrier) or each barrier would need to turn to run down the sides of each property to terminate at the future 60 dB DNL noise contour.

TABLE III

Exterior Noise Exposures, dB DNL

Lot	DNL @ Meas.	Lot Line		Bldg. Envelope		House Setback	
		Exist.	Fut.	Exist.	Fut.	Exist.	Fut.
1	58 @ 120 ft. Santa Teresa	63	65	59	61	54	56
1	63 @ 69 ft. Watsonville Rd.	65	67	62	64	61	63
2	58 @ 120 ft. Santa Teresa	67	69	61	63	56	58
3	58 @ 120 ft. Santa Teresa	67	69	61	63	57	59
4	58 @ 120 ft. Santa Teresa	61	63	59	61	55	57
12	63 @ 69 ft. Watsonville Rd	65	67	61	63	56	58
13	63 @ 69 ft. Watsonville Rd	65	67	61	63	56	58
14	63 @ 69 ft. Watsonville Rd	65	67	61	63	56	58

As the exterior noise exposures at the site exceed the 60 dB DNL limit of the City of Morgan Hill Noise Element standards, noise reduction measures will be required. The recommended measures are described in Section VII of the report.

B. Interior Noise Exposures

To determine the interior noise exposures in project living spaces, a 25 dB reduction was applied to the exterior noise exposures at the building setbacks to represent the attenuation provided by a typical building shell under a closed window condition. The close window condition assumes the installation of standard dual-pane thermal insulating windows and glass doors (rated minimum Sound Transmission Class 28) and that full-time mechanical ventilation (per the Mechanical Code) will be provided for all living spaces allowing the residents to keep the windows closed at all times for noise control.

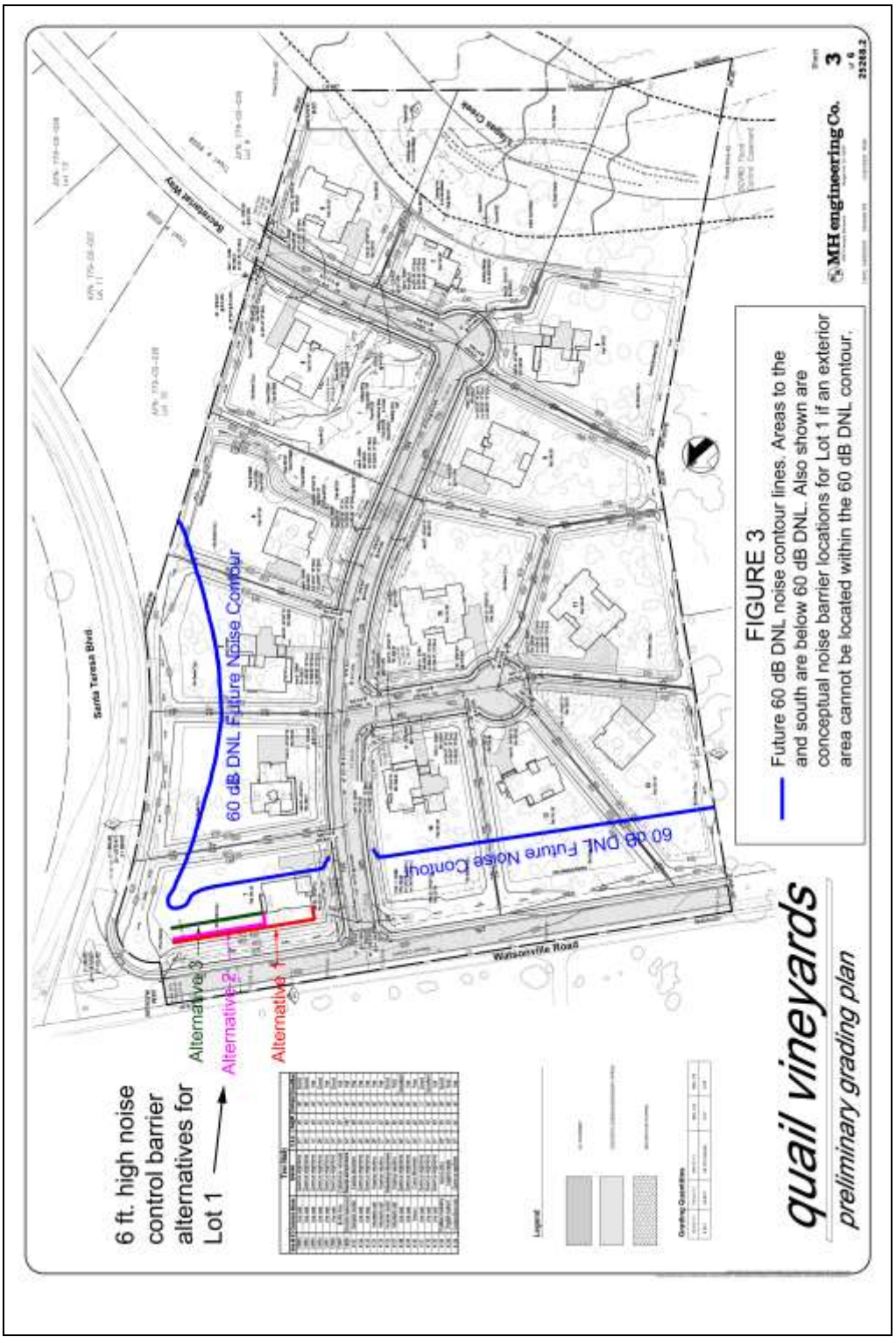
The interior noise exposures in the most impacted living spaces of the project will be up to 36 and 38 dB DNL under existing and future traffic conditions, respectively, at Lot 1. Thus, the interior noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards. Noise control measures for the project interiors will not be required. However, general construction measures to ensure that the building shell adequately reduces exterior noise are provided in Appendix B.

VII. Recommendations

In lieu of installation noise control barriers along the lot lines of the site, whether they are constructed of masonry, concrete, stucco, wood or metal, an optional alternative would be to designate exterior living areas (patios, swimming pools, etc.) that are completely within the 60 dB DNL future noise contour line at each lot. The exception to this would be Lot 1 as the larger portion of the lot is exposed to traffic noise in excess of 60 dB DNL and there may not be enough space to provide an adequate exterior living area.

Figure 3 on page 16 is the Site Development Plan with the 60 dB DNL future noise contours. If an adequate exterior area is situated to the south and west of the contour lines, noise control barriers will not be required. Again, Lot 1 is the exception. Shown by the red, green and brown lines are conceptual noise barrier locations for Lot 1. The Lot 1 barrier, regardless of the exact location, would need to be a minimum of 6 ft. high in reference to the nearest exterior living area ground elevation, e.g., patio pad, pool deck, etc. The barrier height can be minimized by placing it at the top of the slope along the roadway.

To achieve an acoustically-effective barrier, it must be made air-tight, i.e., without cracks, gaps, or other openings and must provide for long-term durability. The barriers can be constructed of wood, concrete, stucco, masonry, metal, earth berm or a combination thereof and must have a minimum surface weight of 2.5 lbs. per sq. ft. If wood fencing is used, homogeneous sheet materials are preferable to conventional wood fencing as the latter has a tendency to warp and form openings with age. However, high quality, air-tight, tongue-and-groove, shiplap, or board and batten construction can be used, provided the minimum surface weight requirement is met and the construction is air-tight. The noise control barrier must be constructed so that all joints, including connections with posts, pilasters or a building shell are sealed air-tight and no openings are permitted between the upper barrier components and the ground.


quail vineyards
preliminary grading plan
MH engineering Co.
Sheet 3
FIGURE 3
Future 60 dB DNL noise contour lines. Areas to the and south are below 60 dB DNL. Also shown are conceptual noise barrier locations for Lot 1 if an exterior area cannot be located within the 60 dB DNL contour.
60 dB DNL Future Noise Contour
60 dB DNL Future Noise Contour
6 ft. high noise control barrier alternatives for Lot 1
Alternative 3
Alternative 2
Alternative 1
Watsonville Road
Santa Teresa Blvd
Bailey Avenue
Llagas Creek
Legend

VIII. Conclusions

In conclusion, the exterior noise exposures at the site will exceed the limits of the City of Morgan Hill Noise Element standards. Noise mitigation measures will be required. The extent of noise mitigation can be minimized using site planning techniques as described herein. The interior noise exposures and noise levels will be will be within the limits of the City of Morgan Hill Noise Element standards. Noise reduction measures for the interior living spaces will not be required.

This report presents the results of a noise assessment study for the planned "Quail Vineyards" single-family development at Watsonville Road and Santa Teresa Boulevard in Morgan Hill. The study findings for existing conditions are based on field measurements and other data and are correct to the best of our knowledge. Future noise projections are based on estimates made by Edward L. Pack Associates, Inc. from information provided by the City of Morgan Hill. However, significant deviations in the predicted traffic volumes, motor vehicle technology, noise regulations or other future changes beyond our control may produce long-range noise results different from our estimates.

Report Prepared By:

EDWARD L. PACK ASSOC., INC.

Jeffrey K. Pack
President

APPENDIX A

References

(a) Site Development Plan, Quail Vineyards, by MH Engineering Co., April 26, 2022

(b) City of Morgan Hill 2035 General Plan, Safety, Services and Infrastructure Element – Noise Chapter, Adopted July 27, 2016

(c) City of Morgan Hill Public Works Department, 2015 Average Daily Traffic Volumes, Exhibit 1, August 21, 2015

(d) City of Morgan Hill General Plan Circulation Element, Network & Policy Revisions TIA Draft Report, by Fehr & Peers, July 29, 2009

(e) Highway Research Board, "Highway Noise – A Design Guide for Highway Engineers", Report 117, 1971

APPENDIX B

Noise Standards, Terminology, Instrumentation and General Building Shell Controls,

1. Noise Standards

A. City of Morgan Hill Noise Element Standards

The Public Health and Safety (Noise) Element of the City of Morgan Hill General Plan, adopted July, 2001, contains land use compatibility standards for various land uses. a section on noise. The Noise Element references the Land Use Compatibility chart from the State of California Guidelines for the Preparation of a Noise Element. The "Normally Acceptable" standards for the land use categories are as follows:

Residential (Single-Family)	60 dB DL
Residential (Multi-Family, Hotels, Motels)	65 dB DNL
Schools, Libraries, Churches, Hospitals	70 dB DNL
Auditoriums, Concert Halls, Amphitheaters	70 dB DNL (conditionally acceptable)
Sports Arenas, Outdoor Spectator Sports	75 dB DNL (conditionally acceptable)
Playgrounds, Neighborhood Parks	70 dB DNL
Golf Courses, Riding Stables, Water Recreation	75 dB DNL
Office Buildings, Business Commercial and Professional	70 dB DNL
Interior Noise Exposure Limits:	
Residential	45 dB DNL
Offices	45 dBA L_{eq}

2. Terminology

A. Statistical Noise Levels

Due to the fluctuating character of urban traffic noise, statistical procedures are needed to provide an adequate description of the environment. A series of statistical descriptors have been developed which represent the noise levels exceeded a given percentage of the time. These descriptors are obtained by direct readout of the Sound Level Meters and Noise Analyzers. Some of the statistical levels used to describe community noise are defined as follows:

L_1 - A noise level exceeded for 1% of the time.

L_{10} - A noise level exceeded for 10% of the time, considered to be an "intrusive" level.

L_{50} - The noise level exceeded 50% of the time representing an "average" sound level.

L_{90} - The noise level exceeded 90 % of the time, designated as a "background" noise level.

L_{eq} - The continuous equivalent-energy level is that level of a steady-state noise having the same sound energy as a given time-varying noise. The L_{eq} represents the decibel level of the time-averaged value of sound energy or sound pressure squared and is used to calculate the DNL and CNEL.

B. Day-Night Level (DNL)

Noise levels utilized in the standards are described in terms of the Day-Night Level (DNL). The DNL rating is determined by the cumulative noise exposures occurring over a 24-hour day in terms of A-Weighted sound energy. The 24-hour day is divided into two subperiods for the DNL index, i.e., the daytime period from 7:00 a.m. to 10:00 p.m., and the nighttime period from 10:00 p.m. to 7:00 a.m. A 10 dB weighting factor is applied (added) to the noise levels occurring during the nighttime period to account for the greater sensitivity of people to noise during these hours. The DNL is calculated from the measured L_{eq} in accordance with the following mathematical formula:

$$DNL = \left[[(10\log_{10}(10^{\Sigma Leq(7\text{-}10)})) \times 15] + [((10\log_{10}(10^{\Sigma Leq(10\text{-}7)})) + 10) \times 9]\right]/24$$

C. A-Weighted Sound Level

The decibel measure of the sound level utilizing the "A" weighted network of a sound level meter is referred to as "dBA". The "A" weighting is the accepted standard weighting system used when noise is measured and recorded for the purpose of determining total noise levels and conducting statistical analyses of the environment so that the output correlates well with the response of the human ear.

3. Instrumentation

The on-site field measurement data were acquired by the use of one or more of the precision acoustical instruments shown below. The acoustical instrumentation provides a direct readout of the L exceedance statistical levels including the equivalent-energy level (L_{eq}). Input to the meters was provided by a microphone extended to a height of 5 ft. above the ground. The meter conforms to ANSI S1.4 for Type 1 instruments and IEC 61672-1:2002 for Class 1 instruments. The "A" weighting network and the "Fast" response setting of the meter were used in conformance with the applicable ISO and IEC standards. All instrumentation was acoustically calibrated before and after field tests to assure accuracy.

Larson-Davis Model 812 Integrating Sound Level Meter
Larson-Davis LxT Precision Integrating Sound Level Meter
Larson-Davis Model 831 Integrating Sound Level Meter

4. Building Shell Controls

The following additional precautionary measures are required to assure the greatest potential for exterior-to-interior noise attenuation by the recommended mitigation measures. These measures apply at those units where closed windows are required:

- Unshielded entry doors having a direct or side orientation toward the primary noise source must be 1-5/8" or 1-3/4" thick, insulated metal or solid-core wood construction with effective weather seals around the full perimeter. Mail slots should not be used in these doors or in the wall of a living space, as a significant noise leakage can occur through them.

- If any penetrations in the building shell are required for vents, piping, conduit, etc., sound leakage around these penetrations can be controlled by sealing all cracks and clearance spaces with a non-hardening caulking compound.

- Ventilation openings shall not compromise the acoustical integrity of the building shell.

- Spray-in or expandable foams are not acceptable as acoustical sealant or as sound absorptive material in walls and ceilings.

APPENDIX C

Noise Measurement Data and Calculation Tables

DNL CALCULATIONS

CLIENT: Blackrock Homes
FILE: 54-057
PROJECT: Quail Vineyard
DATE: 10/19-20/2022
SOURCE: Watsonville Road, Santa Teresa Blvd.

LOCATION 1	Watsonville Rd			
Dist. To Source	69 ft			
TIME	Leq	10^Leq/10		
7:00 AM	63.8	2425504.0		
8:00 AM	61.8	1510911.4		
9:00 AM	61.1	1288383.0		
10:00 AM	60.0	991605.7		
11:00 AM	60.8	1197923.3		
12:00 PM	60.4	1102308.1		
1:00 PM	60.2	1050437.0		
2:00 PM	61.1	1277509.1		
3:00 PM	62.1	1614466.4		
4:00 PM	62.0	1598795.8		
5:00 PM	62.0	1578152.6		
6:00 PM	61.6	1460851.3		
7:00 PM	59.4	878899.1		
8:00 PM	58.7	733062.5		
9:00 PM	56.8	480025.2	SUM=	19188834.3
10:00 PM	54.9	306847.8	Ld=	72.8
11:00 PM	53.4	218684.0		
12:00 AM	49.5	88661.5		
1:00 AM	49.6	90229.0		
2:00 AM	48.0	63519.8		
3:00 AM	50.5	112242.2		
4:00 AM	55.0	318774.1		
5:00 AM	59.7	933363.9		
6:00 AM	61.2	1320158.3	SUM=	3452480.4
			Ln=	65.4
	Daytime Level=	72.8		
	Nighttime Level=	75.4		
	DNL=	**63**		
	24-Hour Leq=	59.7		

LOCATION 2	Santa Teresa Blvd.			
Dist. To Source	120 ft.			
TIME	Leq	10^Leq/10		
7:00 AM	58.2	665018.9		
8:00 AM	56.5	445570.1		
9:00 AM	53.9	245535.9		
10:00 AM	52.8	192401.3		
11:00 AM	53.1	202965.9		
12:00 PM	53.9	244685.9		
1:00 PM	53.8	239392.8		
2:00 PM	54.6	290712.0		
3:00 PM	56.3	421775.2		
4:00 PM	57.0	500440.0		
5:00 PM	57.4	550243.6		
6:00 PM	57.7	595555.2		
7:00 PM	58.7	744584.5		
8:00 PM	52.7	184249.4		
9:00 PM	51.4	137448.5	SUM=	5660579.0
10:00 PM	47.9	61982.8	Ld=	67.5
11:00 PM	46.1	40531.5		
12:00 AM	41.9	15574.9		
1:00 AM	41.7	14917.7		
2:00 AM	39.3	8460.8		
3:00 AM	41.2	13314.4		
4:00 AM	48.3	67316.3		
5:00 AM	54.8	302549.2		
6:00 AM	56.9	495299.6	SUM=	1019947.1
			Ln=	60.1
	Daytime Level=	67.5		
	Nighttime Level=	70.1		
	DNL=	**58**		
	24-Hour Leq=	54.4		

MITIGATION MONITORING AND REPORTING PROGRAM
QUAIL VINEYARDS
MORGAN HILL, CALIFORNIA

Prepared for the:

CITY OF MORGAN HILL

Community Development Department
17575 Peak Avenue
Morgan Hill, CA 95037
408.778.6480

Prepared by:

Raney Planning & Management, Inc.
1501 Sports Drive, Suite A
Sacramento, CA 95834

January 2025

MITIGATION MONITORING AND REPORTING PROGRAM

INTRODUCTION

The City of Morgan Hill, as Lead Agency under the California Environmental Quality Act (CEQA) and State CEQA Guidelines, has prepared the Final Mitigated Negative Declaration (MND) for the Quail Vineyards Project (proposed project). When a lead agency makes findings on significant effects identified in an MND, it must also adopt a program for reporting or monitoring mitigation measures that were adopted or made conditions of project approval (Public Resources Code [PRC] Section 21081.6[a]; State CEQA Guidelines Sections 15091[d], 15097).

This document represents the mitigation monitoring and reporting program (MMRP) prepared by the City of Morgan Hill for the proposed project. This MMRP includes all measures required to reduce potentially significant environmental impacts to a less-than-significant level. In addition, the MMRP identifies the timing of implementation; the agency responsible for implementing the mitigation; and the agency responsible for monitoring the mitigation. The mitigation measures, timing, and responsibility are summarized in Table 1. The implementation and monitoring of the mitigation measures, in conjunction with the implementation of the City's Standard Measures required for such projects, will ensure the reduction of potentially significant environmental effects to less-than-significant levels.

This MMRP has been prepared by the City of Morgan Hill, with technical assistance from Raney Planning & Management, Inc., an environmental consulting firm. Questions should be directed to Tiffany Brown, Senior Planner, at the City of Morgan Hill.

Contact Information:

City of Morgan Hill
Community Development Department
17575 Peak Avenue
Morgan Hill, CA 95037
408.778.6480

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
Prior to Construction			
BIO-1 (IV-1): A southwestern pond turtle survey shall be conducted by a qualified biologist no more than 48 hours prior to construction in the portion of the project site where construction activities overlap within 100 feet of Llagas Creek. The results of the survey shall be submitted to the City of Morgan Hill Development Services Department. If southwestern pond turtles or nests are not found, further mitigation is not necessary. If a southwestern pond turtle is observed within the proposed impact area, a qualified biologist shall relocate the individual to habitat of equivalent or greater value (e.g., riparian wetlands or riparian woodlands adjacent to a perennial creek or intermittent drainage) outside of the proposed impact area prior to construction. If a southwestern pond turtle nest is observed within the proposed impact area, the nest shall be fenced off and avoided until the eggs hatch. The exclusion fencing shall be placed no less than 25 feet from the nest. A qualified biologist shall monitor the nest daily during construction to ensure that hatchlings do not disperse into the construction area. Relocation of hatchlings shall occur as stipulated above, if necessary.	Project Applicant with a Qualified Biologist	City of Morgan Hill Development Services Department	No more than 48 hours prior to construction in the portion of the project site where construction activities overlap within 100 feet of Llagas Creek.
BIO-2 (IV-2): Initial ground-disturbing activities associated with development of the project site (e.g., grading, vegetation removal, staging) should take place between September 1 and March 31 (i.e., outside the colony active period) to avoid potential impacts on special-status bumblebees. If initial ground-disturbing activities does not occur between September 1 and March 31, then at a maximum of 14 days prior to the commencement of construction activities, a qualified biologist with 10 or more years of experience	Project Applicant with a Qualified Biologist	City of Morgan Hill Development Services Department	If initial ground-disturbing activities occur outside of September 1 through March 31, then a maximum of 14 days prior to commencement of construction activities, a preconstruction survey for special-status bumblebees shall be conducted.

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
conducting biological resource surveys within California shall conduct a preconstruction survey for special-status bumblebees in the area(s) proposed for impact. The survey shall occur during the period from one hour after sunrise to two hours before sunset, with temperatures between 65 degrees Fahrenheit and 90 degrees Fahrenheit, with low wind and zero rain. If the timing of the start of construction makes the survey infeasible due to the temperature requirements, the surveying biologist shall select the most appropriate days based on the National Weather Service seven-day forecast and shall survey at a time of day that is closest to the temperature range stated above. The survey duration shall be commensurate with the physical extent of suitable floral resources (which represent foraging habitat) present within the area proposed for impact, and the level of effort shall be based on the metric of a minimum of one person-hour of searching per three acres of suitable floral resources/foraging habitat. A meandering pedestrian survey shall be conducted throughout the area proposed for impact in order to identify patches of suitable floral resources. Suitable floral resources for Crotch's bumblebee include species in the following families: Apocynaceae, Asteraceae, Boraginaceae, Fabaceae, and Lamiaceae. Suitable floral resources for western bumblebee include species in the following families: Asteraceae, Fabaceae, Rhamnaceae, and Rosaceae, as well as plants in the genera Eriogonum and Penstemon. At a minimum, preconstruction survey methods shall include the following:			

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
• Search areas with floral resources for foraging bumblebees. Observed foraging activity may indicate a nest is nearby, and therefore, the survey duration shall be increased when foraging bumblebees are present; • If special-status bumblebees are observed, watch any special-status bumblebees present and observe their flight patterns. Attempt to track their movements between foraging areas and the nest; • Visually look for nest entrances. Observe burrows, any other underground cavities, logs, or other possible nesting habitat; • If floral resources or other vegetation preclude observance of the nest, small areas of vegetation may be removed via hand removal, line trimming, or mowing to a height of a minimum of four inches to assist with locating the nest; • Look for concentrated special-status bumblebee activity; • Listen for the humming of a nest colony; and • If bumblebees are observed, attempt to photograph the individual and identify it to species. The biologist conducting the survey shall record when the survey was conducted, a general description of any suitable foraging habitat/floral resources present, a description of observed bumblebee activity, a list of bumblebee species observed, a description of any vegetation removed to facilitate the survey, and their determination of if survey observations suggest a special-status bumblebee nest(s) may be present or if construction activities could result in take of special-status bumblebees. The report shall be submitted to the			

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
Morgan Hill Development Services Department prior to the commencement of construction activities. If bumblebees are not located during the preconstruction survey or the bumblebees located are definitively identified as a common species (i.e., not special-status species), then further mitigation or coordination with the California Department of Fish and Wildlife (CDFW) is not required. If any sign(s) of a bumblebee nest is observed, and if the species present cannot be established as a common bumblebee, then construction shall not commence until either (1) the bumblebees present are positively identified as common (i.e., not a special-status species), or (2) the completion of coordination with CDFW to identify appropriate mitigation measures, which may include, but not be limited to, waiting until the colony active season ends, establishment of nest buffers, or obtaining an Incidental Take Permit (ITP) from CDFW.			
BIO-3 (IV-3): Construction activities shall be scheduled to avoid the nesting season for most birds in Santa Clara County (February 1 through August 31). If construction activities are scheduled to take place outside the nesting season, all impacts to nesting birds protected under the MBTA and California Fish and Game Code would be avoided. If construction activities and/or tree removal are proposed during nesting season (February 1 to August 31), a preconstruction survey for nesting birds and other protected migratory birds shall be conducted by a qualified ornithologist, consistent with conditions set forth by the SCVHP to ensure that nests are not disturbed during project implementation. The survey	Project Applicant with a Qualified Biologist	City of Morgan Hill Development Services Department	If construction activities are scheduled to take place outside the nesting season (February 1 through August 31), a preconstruction survey for nesting birds shall be conducted.

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
shall be submitted to the City of Morgan Hill Development Services Department for review no more than seven days prior to the start of construction. The survey shall be conducted no more than seven days prior to the initiation of demolition or construction activities, including tree removal and pruning. During this survey, the ornithologist shall inspect all trees and other potential nesting habitats (e.g., trees, shrubs, ruderal grasslands, buildings) in and immediately adjacent to the impact areas for nests. If an active nest is observed during the survey, the ornithologist shall determine the extent of a construction-free buffer zone to be established around the nest (typically 300 feet for raptors and 100 feet for other species), to ensure that no nests of species protected by the MBTA and California Fish and Game Code shall be disturbed during project implementation.			
BIO-4 (IV-4): The project applicant shall obtain a Tree Removal Permit prior to the removal of any Ordinance Sized Trees as defined by the City. The project applicant shall mitigate for the removal of the Ordinance Sized Trees located within the project site, as identified in the Arborist Report prepared by Monk Smith Tree Specialists, Inc. for the proposed project, by providing an on-site replacement planting at a minimum 1:1 ratio with 15-gallon minimum size trees. For the Ordinance Sized Trees to be preserved as part of the project, the project applicant shall implement Tree Preservation Recommendations, including, but not limited to, the following • Include tree identification numbers, protection fence locations, and preservation and guidelines on all the project plans, or	Project Applicant	City of Morgan Hill Development Services Department	The measures shall be included in the notes on construction drawings, prior to initiation of construction.

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
alternatively create a separate plan sheet that includes all tree protection measures labeled "T-1 Tree Protection Plan;" • Place a protection fence around the trees to be retained at a radius of eight times the diameter at breast height (DBH); • Install temporary irrigation or soaker hoses in the Tree Protection Zones (TPZs); • Monitor watering times or amounts to ensure adequate soil saturation; • All tree maintenance and care shall be performed by a qualified arborist with a C-61/D-49 California Contractors License. Tree maintenance and care shall be specified in writing according to American National Standard for Tree Care Operations: Tree, Shrub and Other Woody Plant Management: Standard Practices parts 1 through 10 and adhere to ANSI Z133.1 safety standards and local regulations. All maintenance is to be performed according to ISA Best Management Practices; • Implement general tree protection guidelines including recommendations for arborist assistance while working under trees, trenching, or excavation within a tree's drip line or designated TPZ/Critical Root Zone (CRZ); • Provide a copy of the Arborist Report to all contractors and project managers, including the architect, civil engineer, and landscape designer or architect; and • Arrange a pre-construction meeting with the project arborist or landscape architect to verify tree protection is in place, with the correct materials, and at the proper distances.			

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
The above measures shall be included in the notes on construction drawings, subject to review and approval by the City of Morgan Hill Development Services Department, prior to initiation of construction.			
BIO-5 (IV-5): Prior to issuance of a grading permit for the proposed project, the owner or designee shall pay the Santa Clara Valley Habitat Plan per-acre fee in effect for the appropriate fee zone of the project site, as determined by the Santa Clara Valley Habitat Agency, in compliance with Section 18.132.050 of the Morgan Hill Municipal Code.	Project Applicant	City of Morgan Hill Development Services Department	Prior to issuance of a grading permit.
GEO-1 (VII-1): Prior to approval of any grading permits, the project Civil Engineer shall show on the project plans that the project design adheres to all engineering recommendations provided in the site-specific Geologic Hazard Evaluation and Soil Engineering Study prepared for the proposed project by Earth Systems Pacific. Proof of compliance with all recommendations specified in the Geologic Hazard Evaluation and Soil Engineering Study shall be subject to review and approval by the City Engineer. The project plans shall include, but not be limited to, engineering recommendations related to site preparation and grading, utility trench excavation, backfill, foundations, concrete slab-on-grade floors, exterior concrete flatwork, pavement areas, and project review and construction monitoring. The site demolition activities shall also specify that any trees; aboveground structures; and underground structures, such as abandoned utility and/or irrigation lines, septic tanks, and leach fields, encountered during demolition and construction shall be properly removed, all excavations left open for backfilling, and	Project Applicant with a Civil Engineer	City of Morgan Hill Development Services Department City Engineer Qualified Geotechnical Engineer	Prior to approval of any grading permits.

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
loose material created by the demolition of existing structures should be excavated and replaced as engineered fill.			
HAZ-1 (IX-1): Prior to issuance of a grading permit, the project applicant shall hire a licensed contractor to obtain the applicable abandonment permit from Santa Clara County Department of Environmental Health (SCCDEH) and the City of Morgan Hill, and properly abandon the on-site septic system for review and approval by the SCCDEH and the City of Morgan Hill Building Division.	Project Applicant and Licensed Contractor	Morgan Hill Building Division Santa Clara County Department of Environmental Health	Prior to issuance of a grading permit.
HAZ-2 (IX-2): Prior to the issuance of a grading permit, a well permit shall be obtained from the Santa Clara Valley Water District (SCVWD) for the removal of the existing cistern-type water supply well. Following approval of the well permit, the well removal must be in accordance with County and State regulations and in cooperation with the SCVWD. Proof of compliance shall be submitted to the City of Morgan Hill Building Division.	Project Applicant and Licensed Contractor	Morgan Hill Building Division Santa Clara County Department of Environmental Health	Prior to issuance of a grading permit.
HAZ-3 (IX-3): Prior to issuance of a demolition permit for any on-site structure, the Developer shall consult with certified Asbestos and/or Lead Risk Assessors to complete a visual inspection/pre-demolition survey, and possible sampling, to determine whether any structures to be demolished contain lead-based paint (LBP), asbestos, mercury, or polychlorinated biphenyl caulk. Sampling shall be conducted in accordance with the California Department of Toxic Substances Control's 2006 Interim Guidance Evaluation of School Sites with Potential Contamination from Lead based Paint, Termiticides, and Electrical Transformers. The report shall be submitted for review to the Building Department.	Project Applicant and Certified Asbestos and/or Lead Risk Assessor	Morgan Hill Building Division	Prior to issuance of a demolition permit.

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
If asbestos-containing materials or lead-containing materials are not discovered during the survey, further mitigation related to asbestos-containing materials or lead-containing materials shall not be required. If asbestos-containing materials and/or lead-containing materials are discovered by the survey, the project applicant shall prepare a work plan to demonstrate how all building materials containing LBP, asbestos, mercury, or polychlorinated biphenyl caulk shall be removed in accordance with current California Occupational Health and Safety Administration (Cal/OSHA) regulations and disposed of in accordance with all CalEPA regulations, prior to the demolition and/or removal of the on-site structures. The plan shall include the requirement that work shall be conducted by a Cal/OSHA registered asbestos and lead abatement contractor in accordance with Cal/OSHA Lead in Construction Standard Title 8, CCR 1529 and Title 8, CCR 1532.1 including employee training, employee air monitoring, and dust control. If asbestos is found, all construction activities shall comply with all requirements and regulations promulgated through the National Emission Standards for Hazardous Air Pollutants (NESHAP). The demolition contractor shall be informed that all paint on the buildings shall be considered as containing lead and/or asbestos. The contractor shall follow all work practice standards set forth in the Asbestos National Emission Standards for Hazardous Air Pollutants (Asbestos NESHAP, 40 CFR, Part 61, Subpart M) regulations, as well as Section V, Chapter 3 of the OSHA Technical Manual. All potentially friable asbestos-containing materials shall be removed in accordance with NESHAP guidelines prior to any building demolition or renovation that may disturb the			

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
materials. A registered asbestos abatement contractor shall be retained to remove and dispose of asbestos-containing materials identified in the asbestos survey performed for the site in accordance with the standards stated above. The applicant shall submit the work plan to the City for review and approval. The City has the right to defer the work plan to the Santa Clara County Department of Environmental Health for additional review. Materials containing more than one (1) percent asbestos that is friable are also subject to BAAQMD regulations. Removal of materials containing more than one (1) percent friable asbestos shall be completed in accordance with BAAQMD Section 11-2-303.			
Prior to Issuance of a Building Permit			
TRA-1 (XVII-1): The project applicant shall implement the following CAPCOA VMT reduction strategies to reduce the number of vehicle trips that would be generated by future residents, subject to review and approval by the City Engineer. The timing for each strategy is set forth below: ***1) Community-based travel planning (CAPCOA Handbook Strategy T-23)*** Prior to resident occupancy, the project applicant shall partner with a CBTP service provider such as the Santa Clara Valley Transportation Authority (VTA) or the City of Morgan Hill and ensure that CBTP services are available to project residents. According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.28 percent.	Project Applicant	City of Morgan Hill Development Services Department City Engineer	Prior to resident occupancy (#1). Prior to issuance of a building permit (#2).

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
2) Extend Transit Network Coverage or Hours (CAPCOA Handbook Strategy T-25) Prior to issuance of a building permit, the project applicant shall pay a fee of $4,800 per residential unit ($4,800 x 14 residential units = $67,200), which would support the City's current MoGo or future rideshare service for current and future use up to 20 years. The project applicant would be required to fund the construction of a 0.711-mile expansion of a rideshare service through the new completed road with up to two rideshare stops (one located near Watsonville Road, and one near Secretariate Way and Santa Teresa intersection to be reviewed by the City Civil Engineer). The rideshare stop(s) shall be installed and operational prior to certificate of occupancy of the first residence. According to CAPCOA, this strategy would reduce project-generated residential VMT per capita by 2.71 percent.			
During Construction			
NOI-1 (XIII-1): Noise-generating construction activities associated with the proposed project shall only occur within the hours identified in Municipal Code Section 8.28.040(D). The above language shall be included on final project improvement plans prior to issuance of a grading permit by the City of Morgan Hill Development Services Department.	Project Applicant with Construction Contractor	City of Morgan Hill Development Services Department	Included on final project improvement plans prior to issuance of grading permits, and implemented during construction.
NOI-2 (XIII-2): The following measures shall be implemented during project construction:	Project Applicant with Construction Contractor	City of Morgan Hill Development Services Department	These requirements shall be included via notation on project grading plans, subject to review and approval by the

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
• All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition; • All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, State, or local agency shall comply with such regulations while in the course of project construction; • Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible; • Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors; • Project area and site access road speed limits shall be established and enforced during the construction period; and • Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels. The above requirements shall be included via notation on project grading plans, subject to review and approval by the Development Services Department prior to issuance of a grading permit.			Development Services Department prior to issuance of a grading permit.
TRA-2 (XVII-2): Prior to issuance of demolition or grading permits, the project applicant shall prepare and submit a Traffic Control Plan to the City for review and approval. The Traffic Control Plan shall include, but not necessarily be limited to, the following items, to	Project Applicant with Construction Contractor	City of Morgan Hill Development Services Department City Engineer	Prior to issuance of demolition or grading permits.

TABLE 1. MITIGATION MONITORING AND REPORTING PROGRAM – SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Implementation Responsibility	Monitoring Responsibility[1]	Timing of Implementation
the satisfaction of the City Engineer: • Truck drivers shall be notified of and required to use the most direct route between the site and U.S. Route (US) 101, as determined by the City Engineering Department; • All site ingress and egress shall occur only at the main driveways to the project site and construction activities may require installation of temporary (or ultimate) traffic signals as determined by the City Engineer; • Specifically-designated travel routes for large vehicles shall be monitored and controlled by flaggers for large construction vehicle ingress and egress; • Warning signs indicating frequent truck entry and exit shall be posted on Watsonville Road and Santa Teresa Boulevard; • Any debris and mud on nearby streets caused by trucks shall be monitored daily and may require instituting a street cleaning program; • Construction employee parking shall be provided on the project site to eliminate conflicts with nearby areas. Construction of the project shall be staggered so that employee parking demand is met primarily by using on-site parking; and • If importation and exportation of material becomes a traffic nuisance, the City Engineer shall limit the hours the activities can take place.			

[1] The City of Morgan Hill may hire a qualified contractor to conduct mitigation monitoring.

FINDING

The City of Morgan Hill Development Services Director hereby finds that the proposed project could have a significant effect on the environment; however, there would not be a significant effect in this case because mitigation measures included above and described in the MND are included in the project.

Jennifer Carman
Development Services Director

Date: _____

RESOLUTION NO. 25-02

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORGAN HILL APPROVING A 14-LOT RESIDENTIAL TENTATIVE SUBDIVISION MAP ON A 18.54-ACRE SITE FOR A PROPERTY LOCATED ON THE SOUTHWEST CORNER OF WATSONVILLE ROAD AND SANTA TERESA BOULEVARD AT 14905 SANTA TERESA BOULEVARD (APN 779-02-023) FOR THE QUAIL VINEYARDS (ALSO KNOW AS QUAIL MEADOWS AND WATSONVILLE – BLACKROCK) PROJECT (SD2022-0002)

WHEREAS, on July 8, 2022, an application was submitted for a 14-lot Tentative Subdivision Map to develop 14-custom single-family residential units on an approximate 18.54-acres located at the southwest corner of Watsonville Road and Santa Teresa Boulevard (SD2022-0002)

WHEREAS, such request was considered by the Planning Commission at their regular meeting of January 14, 2025; and

WHEREAS, the project was reviewed in compliance with the California Environmental Quality Act (CEQA); and

WHEREAS, testimony received at a duly-noticed public hearing, along with exhibits and drawings and other materials have been considered in the review process.

NOW, THEREFORE, THE MORGAN HILL PLANNING COMMISSION DOES RESOLVE AS FOLLOWS:

SECTION 1. The Planning Commission has considered the full record before it, which may include but not limited to such things as the staff report, public testimony, and other materials and evidence submitted or provided. Furthermore, the recitals set for above are found to be true and correct and are incorporated herein by reference.

SECTION 2. An Initial Study with Mitigated Negative Declaration was prepared for the project in compliance with the CEQA Guidelines and is consistent with the State and Local Guidelines implementing CEQA.

SECTION 3. The Planning Commission finds the Tentative Subdivision Map, together with its provisions for its design and improvements, is consistent with the General Plan and any applicable specific plans.

SECTION 4. The Planning Commission approves the Tentative Subdivision Map Exhibit “A” and as conditioned incorporated herein as Exhibit “B”.

PASSED AND ADOPTED THIS 14th DAY OF JANUARY, 2024, AT A REGULAR MEETING OF THE PLANNING COMMISSION BY THE FOLLOWING VOTE:

AYES: COMMISSIONERS:

NOES: COMMISSIONERS:

ABSTAIN: COMMISSIONERS:

ABSENT: COMMISSIONERS:

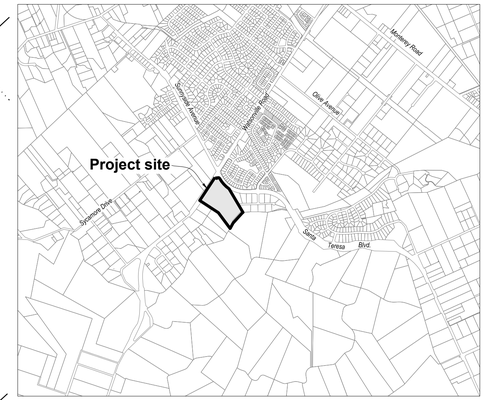
ATTEST: **APPROVED:**

JENNA LUNA, Deputy City Clerk **LIAM DOWNEY, Chair**

quail vineyards

tentative map

EXHIBIT "A"



Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1/PD
PROPOSED ZONING:	RE-1/PD
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

Density Calcs:

TOTAL PROJECT AREA:	18.540 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	16.111 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement
B.S.L.	Building Setback Line

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 10/07/24 DRAWN:RS CHECKED: WJM

Sheet **1** of **7**
25268.2

Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement

Abbreviations:

APN- ASSESSOR PARCEL NUMBER
EX- EXISTING
TBR- TO BE REMOVED

Building Coverage Calcs:

PROJECT NET AREA:	14.878	ACRES
BUILDING COVERAGE:	1.151	ACRES
% BUILDING COVERAGE:	7.73%	

Density Calcs:

TOTAL PROJECT AREA:	18.390 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	14.878 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

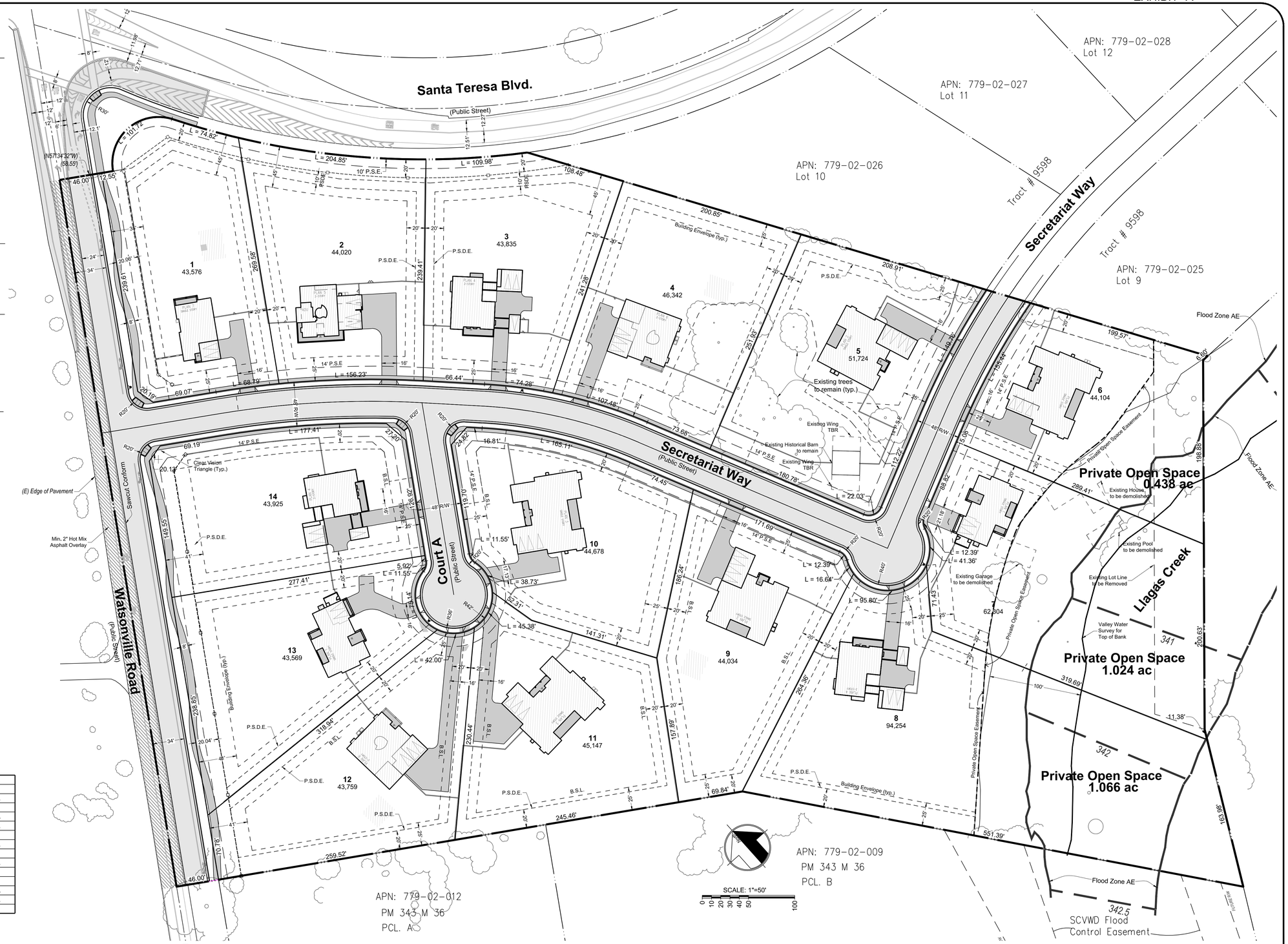
Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1 (RPD)
PROPOSED ZONING:	RE-1 (RPD)
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

	Building Coverage Calculations		
Lot #	Lot Area (SF)	Building Area (SF)	Building Coverage (%)
1	43,576	2035	4.67%
2	44,020	3247	7.38%
3	43,835	3822	8.72%
4	46,342	3664	7.91%
5	51,724	5093	9.85%
6	44,104	5647	12.80%
7	62,304	3412	5.48%
8	94,254	3822	4.06%
9	44,034	5093	11.57%
10	44,678	5647	12.64%
11	45,147	5647	12.51%
12	43,759	3847	8.79%
13	43,569	3412	7.83%
14	43,925	3822	8.70%

# of times the plan occurs	
Plan 1	2
Plan 2	2
Plan 3	3
Plan 4	3
Plan 5	1
Plan 6	2
Plan 7	1

Lot#	# of Stories	Plan#	Total Living SF	BD	BA
1	Single Story	7	2035	4	3
2	2-Story	5	4620	4	3.5
3	2-Story	4	4279	4	4
4	2-Story	6	5651	5	4.5
5	Single Story	2	3805	4	3.5
6	Single Story	3	4187	4	4
7	Single Story	1	2821	3	3.5
8	2-Story	4	4279	4	4
9	Single Story	2	3805	4	3.5
10	Single Story	3	4187	4	4
11	Single Story	3	4187	4	4
12	2-Story	6	5651	5	4.5
13	Single Story	1	2821	3	3.5
14	2-Story	4	4279	4	4



quail vineyards

site development plan

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
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2424 CALLE GALICIA
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DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
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DATE: 10/07/2024 DRAWN:RS CHECKED: WJM

Sheet **2** of **7**
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Benchmark ID: BM 801
S.C.V.W.D.
Elevation: 339.70 (NAVD88)
Description: NGS Steel rod (aluminum box rim stamped "R1458 1990"); at the northeast corner of Watsonville Road and Sunnyside Avenue-Santa Teresa Boulevard; under center of PGE tower #11-75; 0.15 feet lower than rim. City of Morgan Hill.

Date of Ground Survey: 08-05-2008 and 10-15-2022
Date of Drone Survey: 03-15-2022

Tree Study

Tree Id #	Common Name	Species	D.B.H.	Height	Canopy	Condition
12993	Live oak	Quercus virginiana	21"	45'	35'	Good
12994	Live oak	Quercus virginiana	22"	45'	30'	Good
12995	Live oak	Quercus virginiana	16"	40'	25'	Fair
12996	Live oak	Quercus virginiana	28"	55'	45'	Good
12997	Live oak	Quercus virginiana	24"	60'	40'	Fair
12998	Live oak	Quercus virginiana	24"	45'	35'	Good
12999	Bottle tree	Callistemon viminalis	35"	55'	45'	Fair
13000	Coastal redwood	Sequoia sempervirens	54"	100'	40'	Fair
4121	Deodar cedar	Cedrus deodara	39"	60'	50'	Fair
4122	Live oak	Quercus virginiana	25"	50'	35'	Fair
4123	Live oak	Quercus virginiana	38"	55'	45'	Fair
4124	Modesto ash	Fraxinus velutina	28"	75'	50'	Fair
4125	Modesto ash	Fraxinus velutina	27"	65'	45'	Fair
4126	Incense cedar	Calocedrus decurrens	36"	80'	45'	Good
4127	Modesto ash	Fraxinus velutina	31"	56'	60'	Poor
4128	Live oak	Quercus virginiana	32"	50'	50'	Excellent
4129	Live oak	Quercus virginiana	27"	60'	50'	Fair
4130	Pecan	Carya illinoinesis	26"	60'	60'	Poor
4131	Live oak	Quercus virginiana	17"	20'	15'	Good
4132	Live oak	Quercus virginiana	31"	40'	50'	Excellent
4133	Live oak	Quercus virginiana	31"	30'	20'	Fair
4134	Fruitless mulberry	Morus alba	23"	25'	35'	Good
4135	English walnut	Juglans regia	42"	40'	30'	Poor
4136	Coastal live oak	Quercus agrifolia	27"	65'	40'	Fair

Legend

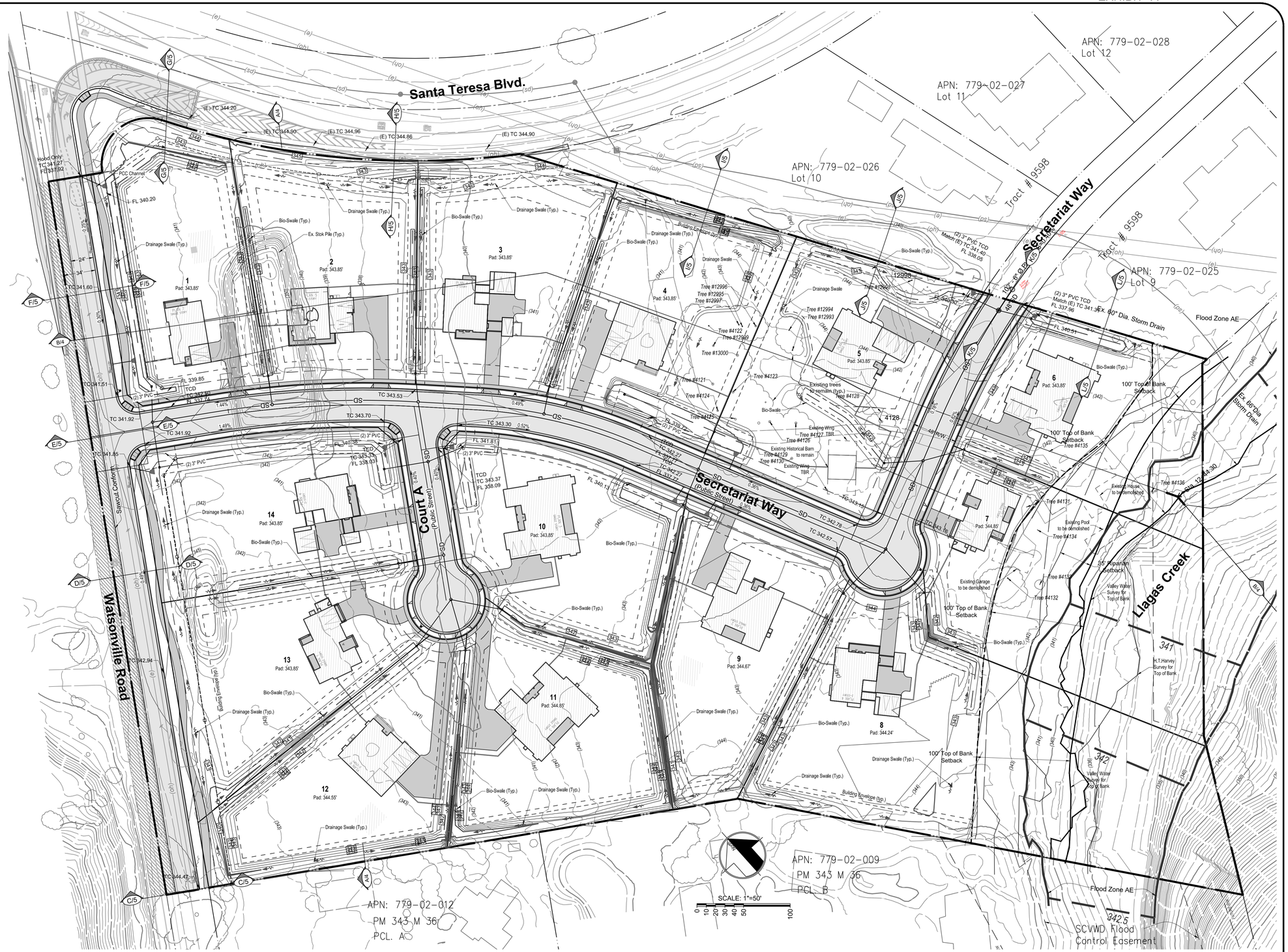
AC PAVEMENT

CONCRETE SIDEWALK/DRIVEWAY APRON

TCD.....Through Curb Drain per std detail S-10

Grading Quantities

Cut (C.Y.)	Fill (C.Y.)	Net (C.Y.)	Max. Cut	Max. Fill
4,241	42,974	38,733 (Import)	3.21'	5.25'



quail vineyards

preliminary grading plan

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2730 LONE OAK CT.
GILROY, CA 95020
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MH ENGINEERING
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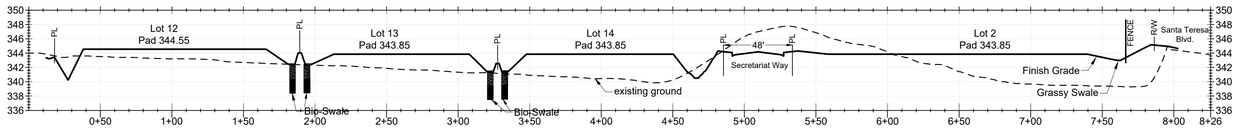
DATE: 10/07/24 DRAWN:RS CHECKED: WJM

Sheet **3** of **7**
25268.2



PROFILE: Section: A
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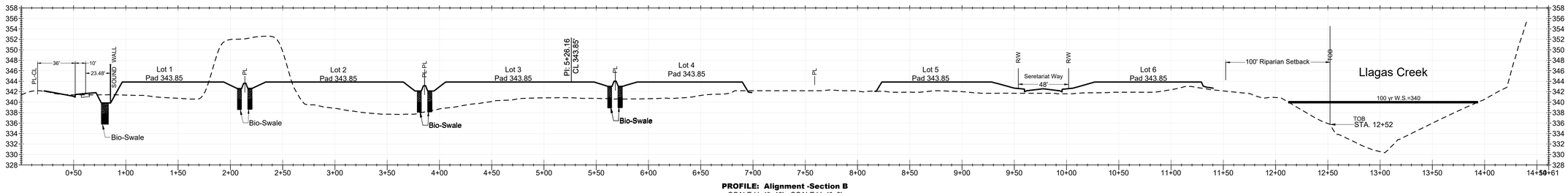

PROFILE: Alignment -Section B
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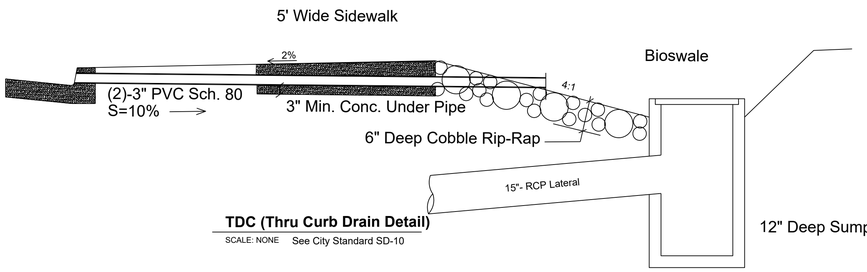
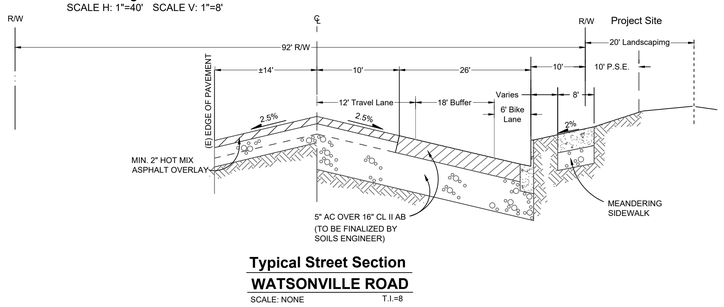
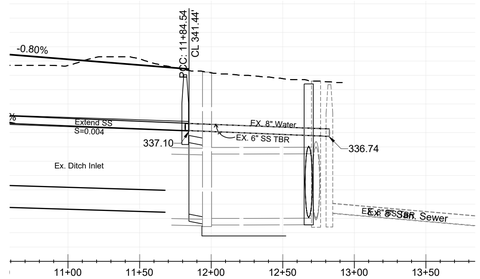


TDC (Thru Curb Drain Detail)
SCALE: NONE See City Standard SD-10

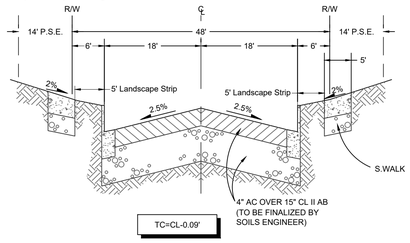


Typical Street Section
WATSONVILLE ROAD
SCALE: NONE T.I.=8



CONFLICT MANHOLE DETAIL and Justification

Two 72" dia. conflict manholes are beig proposed for sanitary sewer conflicts with existing large 60" dia. storm drains in existing Secratariat Drive. 10" dia. steel sleeves are proposed through the storm drain manhole to encase the new 6" dia. PVC sanitary sewer. The sleeve is above the spring line of the 60" storm pipe so the sleeve will not cause debris to plug the pipe. The manhole also provides more conveyance than the pipe so no hydraulic issues will be encountered. One alternative to replacing the existing sewer with conflict manholes is to install a sanitary sewer pump station which is not the "green" solution. A second alternative is to construct the new sanitary sewer line under the existing storm drain in a "siphon" design. There is over 2' of hydraulic "head" to keep the low flows moving. The last alternative is to connect to the existing sanitary sewer stub at it's high elevation and have all other utilities designed below the sanitary sewer. This will require raising the street profile 2' +/- near Watsonville Road with no possibility of being extended.



Typical 48' Street Section
SCALE: NONE T.I.=7 R-VALUE=5

Broadband Standards

CITY OF MORGAN HILL

For Broadband connectivity, a project is required to install conduits in all the public rights-of-way fronting the project site to accommodate multiple broadband providers. The following standards apply:

A. Design Plans

1. The project is required to submit design plans to include an engineering plan and profile of each street showing the location of existing underground utilities in the proposed path of the broadband conduit installation.
2. The design plans shall also include the approximate locations and dimensions for surface restoration.

B. Broadband Conduit

1. Provide a minimum of two (2) conduits each with at least two pull cables. At least one conduit shall remain empty and reserved for use by a potential future broadband service provider.
2. Each conduit shall be a 4" diameter PVC pipe, non-pressure type but has adequate stiffness for direct burial usage without encasement in concrete. The type of pipe shall be consistent with industry standards and be orange in color.
3. Broadband system designers shall field-verify the locations of existing utilities and surface features along and adjacent to the proposed conduit alignment.
4. The preferred horizontal conduit alignment is at centerline of sidewalk or as approved by the City Engineer.
   a. For conduits allowed in the street: Locate new conduit 3' from face of curb. Conduits shall be located parallel to the street centerline, where practicable, and shall not meander along the street. Street crossings shall be perpendicular to the street centerline.
5. Horizontal Clearance:
   a. Minimum 1' horizontal clearance from new conduit to other existing utilities, excluding water mains, gas lines, and electric lines.

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   b. Minimum 3' horizontal clearance from new conduit to existing water main.
   c. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required horizontal separation requirements.
6. All conduits shall be installed underground using directional boring method or open trench.
   a. For Directional Bore Design
      i. Plans shall include a layout plan and profile sheets for directional bores. All existing utilities must be shown to scale on the plan and profile views.
      ii. Vertical Clearance: Provide 3' minimum vertical clearance from all utilities. This includes minor services, such as water services and sewer laterals. For deep crossings, provide a minimum of 5' clearance from utilities and structures. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required vertical separation requirements.
      iii. Boring and Receiving Pits: Show the length, width, depth, and location of the boring and receiving pits on the plans and profiles. The pits are to be located to minimize the construction impact to the adjacent properties and streets. Pits should not be in front of existing driveways, restaurants, bus stops, fire hydrants, and within street intersections.
      iv. Conflicts with Trees: If trees are in the way of the directional bore, the conduit shall be bored 8' to 12' underneath the tree roots rather than around the tree.
   b. For Trench Design
      i. For open-trench construction in the street: Conduit shall have a minimum cover of 36" above the top of the conduit and allow at least 6" between the top of the conduit and the bottom of the street structural pavement section.
      ii. For a trench outside the street section: Conduit shall have a minimum cover of 30".
      iii. Open trenches deeper than 60" must comply with Cal/OSHA standards, requiring protective systems, such as shoring.

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6/26/2020

      iv. Vertical Clearance: Provide 12" minimum vertical clearance from all other utility lines and services, including other telecommunication lines.
7. Tracer Wire: The conduits shall be installed with a tracer wire.
   a. Install tracer wire in the trench or bore with all underground conduits. Ensure the tracer wire provides end-to-end electrical continuity for electronically locating the underground conduit system.
   b. In a trenching operation, install the tracer wire no more than 3" above the conduit.
   c. In a boring operation, install the tracer wire in an encasement.
8. Identification Tape: A 6" wide, orange magnetically detectable identification tape shall be installed 12 inches above the entire length of the conduit route. The tape shall be continuously imprinted with "BROADBAND CONDUIT".

C. Pullboxes

1. Indicate locations of all pullboxes, other service boxes and manholes on the design plans.
2. Pullboxes shall be a No. 8 pullbox per City of Morgan Hill Standard E-6.
3. Pullboxes and splice boxes shall be located within the park strip/planter strip or at the back of sidewalk unless the City Engineer approves an alternative location.
4. The maximum distance between any two pull boxes shall not exceed 1,200 feet. Within the 1,200-feet distance, provide pullboxes at locations wherever the cumulative change of direction of the conduit exceeds 180 degrees.
5. The minimum bending radius for conduit shall be 3 feet.
6. Pullboxes shall be located a minimum of 12 inches from all structures.

D. Manholes

1. A detail of the manhole must be shown on the plans.
2. Manholes for broadband conduit shall not be allowed in the street unless an exception is granted by the City Engineer.

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6/26/2020

3. Manholes allowed to be in the street must have cast iron frames and covers.
4. Manholes that are in sidewalks shall have a concrete polymer frame and cover that matches the color and texture of the sidewalk.
5. Manholes shall not be placed within a driveway approach or within the curb return at intersections.
6. All manholes must be rated for a minimum H-20 wheel load.
7. The name "BROADBAND" shall be permanently cast into or engraved on the manhole covers.

E. Related Work

Refer to the City's Design Standards and Standard Details for Construction for pavement materials, trench limits of restoration, backfill for boring, and backfill for trenching.

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6/26/2020

Last Modified by: Dave Brown, Date Modified: 2020-06-26 at 2:24 pm, Plotted by: Dave Brown, Date Plotted: 6/30/2020 12:22 PM, Xref: Cover Sheet, Xref: Broadband Standards, Xref: Broadband Standards, Xref: Broadband Standards

quail vineyards

grading cross sections

Geotech Engineer:
Earth Systems

Biologist
H.T. Harvey and Ass.

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
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SANTA BARBARA, CA 93109
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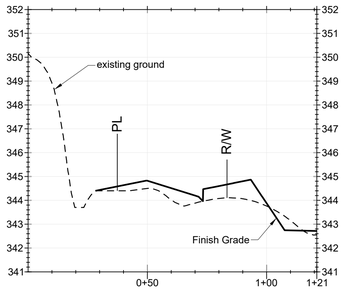
Sheet **4** of **7**
25268.2

DATE: 10/07/24 DRAWN:RS CHECKED: WJM

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM



PROFILE: Section : C
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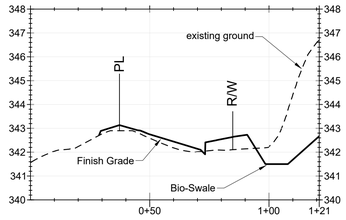

PROFILE: Section : D
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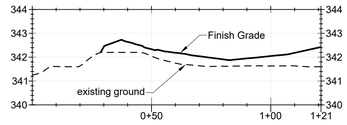

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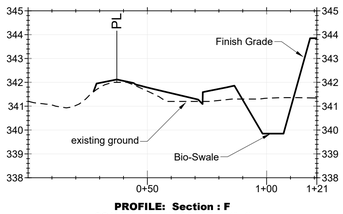

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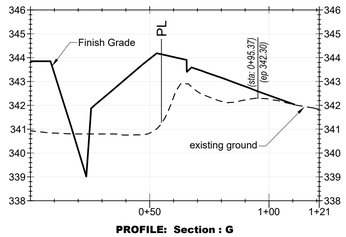

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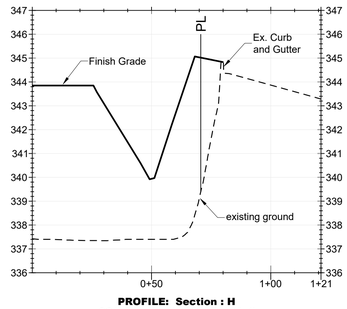

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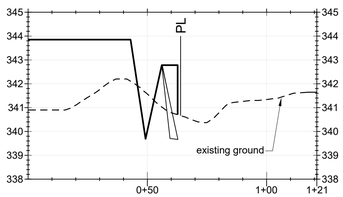

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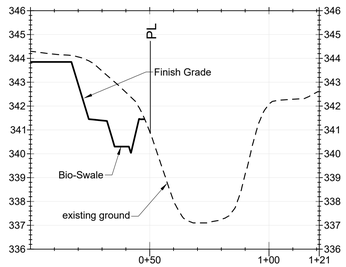

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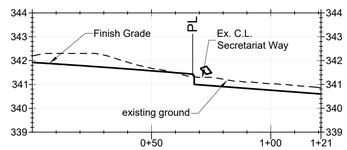

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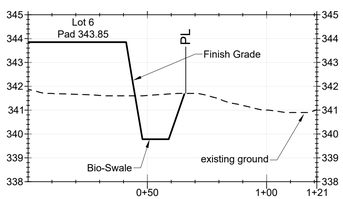


PROFILE: Section : L
SCALE H: 1"=40' SCALE V: 1"=4'

quail vineyards

grading cross sections

DpC
DEVELOPMENT
PROCESS
CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

Geotech Engineer:
Earth Systems

Biologist
H.T. Harvey and Ass.

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 10/07/24 DRAWN:AC CHECKED: WJM

Sheet **5** of **7**
25268.2

C:\Projects\25268.2 Blackrock\Grading\25268.2 Grading Plans.dwg, 10/7/2024 3:12:24 PM, Morgan Hill, Plotted by Angel Ortiz-Trejo

EXHIBIT "A"

APN: 779-02-028
Lot 12

APN: 779-02-027
Lot 11

APN: 779-02-026
Lot 10

APN: 779-02-025
Lot 9

APN: 779-02-009
PM 343 M 36
PCL. B

APN: 779-02-012
PM 343 M 36
PCL. A

Watsonville Road

Santa Teresa Blvd.

Secretariat Way
(Public Street)

Court A
(Public Street)

Tract # 9598

Flood Zone AE

Ex. 60" Dia. Storm Drain

Ex. 60' Dia. Storm Drain

Ex. Swale

Ex. 66' Dia Storm Drain

Liagas Creek

PVWMA Open Space Easement

35' Riparian Setback

100' Top of Bank Setback

K.T. Harvey Survey for Riperian Habitat

Valley Water Survey for Top of Bank

SCVWD Flood Control Easement

Ex. 6" Water Main

Ex. 8" Sanitary Sewer

Ex. 8" Storm Drain

Bio-Swale (Typ.)

Drainage Swale (Typ.)

Building Envelope (typ.)

Transformer (Typ.)

Fire Hydrant

(e) well to remain

(e) water tank to be relocated

(e) street light to be removed

Existing trees to remain (typ.)

Existing Historical Barn to remain

(e) well to be capped per SCVWD requirements

(E) Utility Pole and Electric Overhead Line to Remain from this pole South

SCALE: 1"=50'

0 10 20 30 40 50 100

Intersection Striping Detail

Scale: 1"=50'

Legend

Proposed	Description	Existing
	Project Property Boundary	
	Property Line	
	Centerline	
	Easement, as noted	
	Curb and Gutter	
	Driveway Approach	
SD	Storm Drain	(sd)
SD	Perforated Storm Drain	(sd)
SS	Sanitary Sewer	(ss)
W	Water Main	(w)
IRR	Irrigation Line	(irr)
F	Fire Service	(f)
G	Gas Main	(g)
E	Underground Electric	(e)
E OH	Overhead Electric	(e) (oh)
T OH	Telephone	(t) (oh)
JT	Joint Trench/ Broadband	(jt)
	Chainlink Fence	
	Wood Fence	
	Street Barricade	
100	Major Contour	(100)
99	Minor Contour	(99)
	Benchmark	
	Monument, Type as shown	
2	Revision	
#/A	Section	
	Swale	
2.2%	Slope	(2.1%)
SD	Storm Drain Manhole	(sd)
	Curb Inlet	
	Drop Inlet	
SS	Sanitary Sewer Manhole	(ss)
	Fire Hydrant	(fh)
CO	Cleanout	(co)
	Gate Valve	
	Transformer	
	Utility Pole	
	Electrolier	
S	Sewer Service	S
W	Water Service	W
	Transformer	
	AC Pavement	
	AB Areas	
	PCC walks/driveways	
	Structures	
	Bio-Retention Area	
	Decorative Pavers	

** existing features are labeled in italics and parenthesis, typical

Utility Note:
Underground all existing overhead utilities on project frontage along Watsonville Road and within the project boundary in accordance with city standards and affected utility company standards.

Fire Hydrant Location Identifier:
Prior to project final inspection, the general contractor shall ensure that an approved ("Blue Dot") fire hydrant location identifier has been placed in the roadway, as directed by the fire department

quail vineyards

site utility plan

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 10/07/24 DRAWN:RS CHECKED: WJM

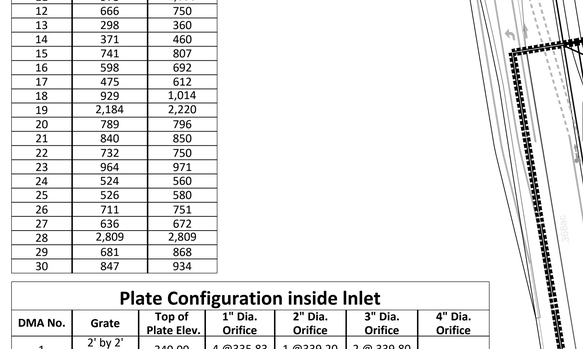
Sheet **6** of **7**
25268.2

Bio-Swale Area table

DMA NO.	Required Bio-swale area (sf)	Provided Bio-swale area (sf)
1	2,242	2,558
2	643	680
3	711	720
4	586	600
5	681	780
6	576	640
7	631	640
8	2,065	2,093
9	1,147	1,202
10	892	1,175
11	973	1,050
12	666	750
13	298	360
14	371	460
15	741	807
16	598	692
17	475	612
18	929	1,014
19	2,184	2,220
20	789	796
21	840	850
22	732	750
23	964	971
24	524	560
25	526	580
26	711	751
27	636	672
28	2,809	2,809
29	681	868
30	847	934

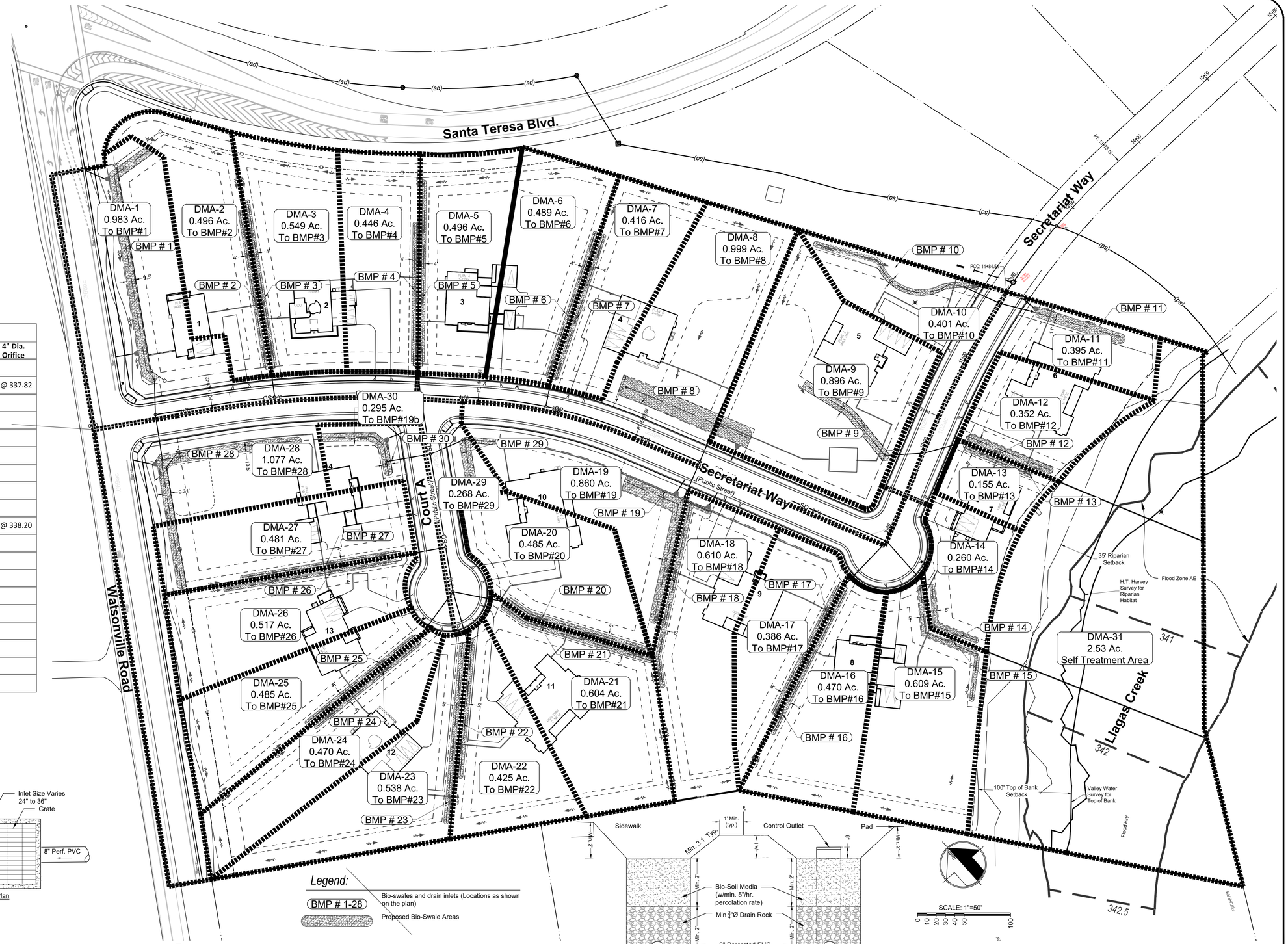
Plate Configuration inside Inlet

DMA No.	Grate	Top of Plate Elev.	1" Dia. Orifice	2" Dia. Orifice	3" Dia. Orifice	4" Dia. Orifice
1	2' by 2' @ 340.33	340.00	4 @335.83	1 @339.20	2 @ 339.80	
2 & 3	2' by 2' @ 341.02	340.00			2 @ 336.52	1 @ 337.82
4 & 5	2' by 2' @ 341.17	340.00		2 @ 336.67	1 @ 338.87	
6 & 7	2' by 2' @ 340.60	340.00			2 @ 336.10 1 @336.80	
8	2' by 2' @ 340.60	340.20		1 @ 336.10	1 @ 337.10	
9	2' by 2' @ 341.75	340.00	3 @ 336.36	1 @ 337.90		
10	2' by 2' @ 340.86	340.20	3 @ 336.36	1 @ 337.90		
11	2' by 2' @ 341.68	341.20		2 @ 340.00		
12 & 13	2' by 2' @ 341.87	340.00		1 @ 337.37	1 @338.20	
14 & 15	2' by 2' @ 341.87	340.00			2 @ 337.37	1 @ 338.20
16 & 17	2' by 2' @ 341.37	340.00		2 @ 336.87	1 @ 338.00	
18 & 19	2' by 2' @ 340.66	340.00		3 @ 336.16	1 @ 338.80	
20 & 21	2' by 2' @ 341.13	340.00		2 @ 338.13	2 @ 336.13	
22 & 23	2' by 2' @ 342.15	340.00		3 @ 337.65 1 @ 338.65		
24 & 25	2' by 2' @ 340.74	340.00		2 @ 336.24		
26 & 27	2' by 2' @341.74	340.00		2 @ 337.24	1 @ 339.24	
28	3' by 3' @340.23	340.00		1 @336.50 1 @335.73		
29	3' by 3' @341.23	340.00	2 @336.73 2 @337.50			
30	3' by 3' @341.21	340.00	3 @336.73 3 @337.50			



Typical Outlet Control Structure Detail

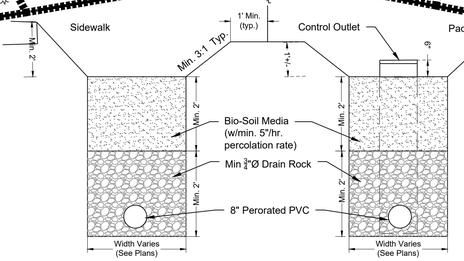
N.T.S.



Legend:

BMP # 1-28 — Bio-swales and drain inlets (Locations as shown on the plan)

Proposed Bio-Swale Areas



Typical Bio-Swale Detail Along Property Line

N.T.S.

SCALE: 1"=50'

0 10 20 30 40 50 100

quail vineyards

Stormwater Control Plan

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

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2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 10/07/24 DRAWN:RS CHECKED: WJM

Sheet **7** of **7**
25268.2

EXHIBIT "B"
STANDARD CONDITIONS

APPLICATION NO: SD2022-0002, THE QUAIL VINEYARDS (ALSO KNOW AS QUAIL MEADOWS AND WATSONVILLE – BLACKROCK) PROJECT (EA2022-0009)

THE FOLLOWING APPROVAL REQUIREMENTS AND ANY SPECIAL CONDITIONS SHALL BE APPLIED THROUGH THE DEVELOPMENT APPROVAL PROCESS.

Legend

MHMC= Morgan Hill Municipal Code
MHARH= Morgan Hill Architectural Review Handbook
CMH= City of Morgan Hill
CFC= California Fire Code

I. PROJECT DESCRIPTION

SD2022-0002/EA2022-0009: Watsonville - Blackrock (Quail Meadows): Request for a Tentative Subdivision Map of an existing 18.54-acre site for the development of 14 single-family detached residential lots with the completion of Secretariat Way (public street) to Watsonville Road and other associated site improvements.

II. PROJECT CONDITIONS OF APPROVAL

This Subdivision Map approval is limited to the plan set date stamped with an approval by Planning Commission on file (File Number SD2022-00002) with the Development Services Department.

PLANNING DIVISION

DEFENSE AND INDEMNITY

A. As part of, and in connection, with this application to the City of Morgan Hill, Applicant agrees to defend, indemnify, and hold harmless the City of Morgan Hill, its officers, agents, employees, officials and representatives (Indemnitees) from and against any and all claims, actions, or proceedings arising from any suit for damages or for equitable or injunctive relief which is filed against City to attack, set aside, void or annul its approval of this application or any related decision, or the adoption of any environmental documents which relates to said approval. The City shall promptly notify the Applicant of any such claim, action or proceeding and the City shall cooperate fully in the defense thereof. In the event that Applicant is required to defend Indemnitees in connection with the proceeding, Indemnitees shall retain the right to approve (a) the counsel to so defend Indemnitees; (b) all significant decisions concerning the manner in which the defense is conducted; and (c) any and all settlements, which approval shall not be unreasonably withheld. This indemnification shall include, but is not limited to, (a) all pre-tender litigation

costs incurred on behalf of the City, including City's attorney's fees and all other litigation costs and expenses, including expert witnesses, required to defend against any lawsuit brought as a result of City's approval or approvals; (b) reasonable internal City administrative costs, including but not limited to staff time and expense spent on the litigation, after tender is accepted; and (c) all damages, costs, expenses, attorney fees or expert witness fees that may be awarded to the prevailing party arising out of or in connection with the approval of the application or related decision. City may, in its sole discretion, participate in the defense of such action; but such participation shall not relieve Applicant of its obligations under this condition. The undersigned hereby represents that they are the Applicant or are fully empowered by the Applicant as their agent to agree to provide the indemnification, defense and hold harmless obligations, and the signature below represents the unconditional agreement by Applicant to be bound by such conditions.

TIME LIMITS

B. **Term:** The Subdivision Map approval granted pursuant to this Resolution shall remain in effect for two years from approval date. Failure to obtain a final map within this term shall result in termination of approval unless an extension of time is granted with a showing of just cause prior to expiration date. **(MHMC 18.108.040)**

GENERAL

C. **Mitigation Fee Act:** Notice is hereby given that, pursuant to the Mitigation Fee Act, the City of Morgan Hill charges certain fees (as such term is defined in Government Code Section 66000) in connection with approval of this development project for the purpose of defraying all or a portion of the cost of public facilities related to this development project (Mitigation Fee Act Fees). These fees do not include fees for processing applications for governmental regulatory actions or approvals .. The Mitigation Fee Act Fees applying to this project are listed in the schedule of fees to be provided at building permit stage and are generally described below in the Engineering Divisions Project Specific Conditions, section C. Notice is also hereby given that the Developer has an opportunity to protest the imposition of the Mitigation Fee Act Fees within 90 days of the approval or conditional approval of this development project and that the 90-day protest period has begun.

D. **Covenants, Conditions and Restrictions**: The applicant shall provide a set of Covenants, Conditions and Restrictions (CC&R's), Bylaws and Articles of Incorporation, for review and approval by the Development Services Director prior to final occupancy or recordation of a final map. All such CC&Rs shall include the following:

1. The Owners recognize that the use, modification and proper maintenance of the Common Area and public right-of-way(s)* are for the benefit of all citizens of the City of Morgan Hill (City) and that the City is an intended third-party beneficiary of these covenants, conditions and restrictions and may, upon notice of hearing as set forth below, exercise the same powers of enforcement as the Association.

   *Public right-of-way: Exclusive of streets dedicated to and accepted by the City of Morgan Hill.

2. The City may, by mail or personal delivery, give written notice of the breach of any maintenance obligation to the Association with a demand that such breach be remedied. If such breach is not remedied within thirty (30) days of the mailing or delivery of such notice, the City shall have standing and the right (but not the obligation) to bring a court action against the Association and Owners to enforce such provision. In addition, the City shall be entitled to recover reasonable attorneys' fees and costs incurred in such action.

3. The Notice may also contain a date for a hearing on the matter before a City employee designated by the City (which hearing shall be held no sooner than fifteen (15) days after mailing of such notice), and if after such hearing the City determines that there has been inadequate maintenance, the City shall have the right (but not the obligation) to undertake the maintenance of the Common Area or public right-of-way in question. Any and all costs incurred by the City in so maintaining the Common Area or public right-of-way shall be a lien against all the properties included with the Project and shall be the personal responsibility of the Owners and the Association.

4. The entire Project and all of the properties located thereon shall be subject to the conditions and restrictions of all subdivision and other Project approvals by the City, with respect to the Project. Any changes and/or modifications to the Project and/or any Unit, including but not limited to changes to the exterior of any Unit, may be subject to review and approval of the City of Morgan Hill as may be determined by review of the Project approvals by the City of Morgan Hill.

5. This section may not be amended without the prior written consent of the Development Services Director for the City. Nothing contained in this section shall limit any other right or remedy which the City may have under its ordinances or state law.

6. For the purposes of this section, the question of whether there has been a breach of a maintenance obligation or adequate maintenance shall be

determined by the provisions of the original Declaration as first recorded with the County Recorder for Santa Clara County and by any amendment thereto, but only to the extent that such maintenance obligation or duty of maintenance is increased by such amendment.

ENGINEERING DIVISION

PROJECT SPECIFIC CONDITIONS:

A. **Management:** The project shall comply with the California Regional Water Quality Control Board Central Coast Region Resolution No. R3-2013-0032 as documented by the Stormwater Management Guidance Manual for Low Impact Development and Post-Construction Requirements. A copy of the Guidance Manual can be obtained through the following link: https://www.morgan-hill.ca.gov/DocumentCenter/View/12671/Storm-Water-Management-Guidance-Manual?bidId=

1. At grading permit/improvement plan stage, the project shall address the following:
   a. Technical Infeasibility: Per the project's Stormwater Control Plan/Report ("Report"), the project is claiming Technical Infeasibility due to very low site infiltration and a shallow high seasonal groundwater table.
      i. Low Infiltration: The Report provides infiltration test results prepared by Cornerstone Earth Group dated March 16, 2023. Locations I-1 and I-3 both have infiltration rates of 3.45 inches per hour and 5.59 inches per hour, respectively. Locations I-2 and I-4 have infiltration rates of 0.18 and 0 inches per hour, respectively. Based on the locations and results of the infiltration rate tests, the project has not fully demonstrated that the soils significantly limit infiltration for the entire site. Therefore, there is not enough justification to classify the entire site as "technically infeasible". The project shall mitigate the traditional Post-Construction Requirements (PCR) 1-4 for the lots west of the Secretariat Way extension (Lots 1-5 and Lots 9-14). The project may be allowed to claim Technical Infeasibility for the remainder of the site (Lots 6-8).
      ii. Shallow Seasonal High Groundwater Table: The Report provides boring test results prepared by Cornerstone Earth Group dated March 16, 2023. The test results show the seasonal high groundwater to be approximately 12 feet below the existing grade. This will result in the vertical separation between the proposed system inverts of the proposed stormwater control measures and the seasonal high groundwater to be less than the required 10 feet. Due to the proximity of the project to Llagas Creek, the Developer shall

submit the project's improvement plans for review by Valley Water to confirm if the 10-foot vertical separation will be required. After Valley Water's review, the City will determine if the vertical separation will be adequate justification for Technical Infeasibility to be applied to the entire site.

iii. If the project is <u>not</u> allowed to claim Technical Infeasibility for the entire site, the project will be required to address the following comments:
   1) Update the stormwater calculations and the Report to reflect the portions of the project that will be required to meet the traditional PCRs.
   2) Revise the retention volume calculations based on the Technical Infeasibility only being allowed for Lots 6-8. For the portion of the project that is subject to meeting the traditional PCRs 1-4, the retention volume for PCR-3 can only be accounted for up to the bottom of the underdrain within the gravel section of the bioretention.
   3) Update the drawdown time calculations to reflect the change in Technical Infeasibility.
   4) Please note that the 10% equivalent impervious surface area (EISA) can only be applied to the technically infeasible areas.

iv. If the project is allowed to claim Technical Infeasibility for the entire site, provide additional narrative and supporting documentation in the Report to adequately demonstrate the basis for Technical Infeasibility.

b. Update the drawdown time calculations to reflect the appropriate infiltration rates based on the tests provided by Cornerstone Earth Group.
c. Confirm how PCR-4 is being met. The model results show the post-development peak flows are greater than the pre-development peak flows for the 100-year event in DMA 9 and the 25-year event in DMA 19.
d. The plans show that adjacent BMPs will share an overflow structure. Provide a detail to demonstrate how this will function.
e. Update the contact information for the owner of facilities and responsible party for conducting the SCM maintenance in the Operation and Maintenance Plan if this contact has changed.
f. The Report interchangeably refers to the SCMs as retention/detention ponds, above ground bioretention/detention ponds, and bioswales. Retention and detention ponds typically do not include biotreatment soil media and gravel. However, the model inputs show that all of the SCMs account for bio soil media and gravel storage. Clarify what SCMs are being proposed in the design.
g. Provide additional narrative in the Report regarding the project's compliance with PCR-2. There is no mention of the 4% rule for sizing and

separate sizing for PCR-3 runoff retention requirements. The application of the 10% EISA should not be discussed at all under the PCR-2 narrative.

h. Update the Stormwater Control Plan/Report to show the new elevations throughout the project site resulting from the revised sewer design that elevated the public street.

2. The project is proposing to widen Watsonville Road and is required to include the additional impervious area created and/or replaced along Watsonville Road when meeting compliance with the PCRs. At grading permit/improvement plan stage, the project shall revise the Drainage Management Areas to include the offsite, additional impervious areas created and replaced to demonstrate compliance with the PCRs.

3. The project shall be required to construct all offsite improvements in one phase. All SCMs and associated drainage improvements that serve the DMAs for the offsite improvements shall be constructed during the first phase.

4. At building permit stage for each lot, submit a stormwater update to the Stormwater Control Plan/Report that shows compliance of each lot with the PCRs. The stormwater update shall include a comparison of the lot's estimated impervious surface area in the original SWCP/Report and the proposed impervious surface area on the building plans.

5. Stormwater BMP Operation and Maintenance Agreement(s): Prior to Final Map Approval, the owner(s) of the site shall enter into a formal, written Stormwater BMP Operation and Maintenance Agreement(s) with the City. The City shall record this agreement, against the property or properties involved, with the County of Santa Clara and it shall be binding on all subsequent owners of land served by the storm water management BMPs. The City standard Stormwater BMP Operation and Maintenance Agreement will be provided by Land Development Engineering at building permit/improvement plan stage.

B. **Flood:** Majority of the site in Flood Zone D and a portion in Flood Zone AE, Elevation 341.0' to 342.5' North American Vertical Datum of 1988 (NAVD88).

1. Portions of proposed Lots 6, 7 & 8 are in Flood Zone AE, with approximate flood elevations ranging from 341.0' to 342.5' NAVD88. Flood Zone AE is within a designated Federal Emergency Management Agency (FEMA) 100-year floodplain. The majority of the project site is in Flood Zone D, defined as an area of undetermined flooding. The proposed residential structures in Lots 6, 7 & 8 are in Zone D.

2. No grading nor construction of new structures will be allowed in the Zone AE area.

3. At improvement plan stage, add the estimated 100-year flood elevation at the site on the Final Drainage Report and a statement about the proposed finish floor elevations of all residential structures.

C. **Fees**

1. **Parkland Dedication/Parkland Fee In-Lieu:** This project is subject to the Parkland Dedication and Parkland Fee In-Lieu requirements **(MHMC 17.28).**
   a. The developer shall pay fees, in-lieu of parkland dedication, at the time of filing of the project's final map. The project's parkland obligation will be calculated using the formula shown in MHMC Section 17.28.060. The estimated Parkland In-Lieu for the project is **$295,000** for the proposed 14 units.
   b. Private recreation credits, which could allow a credit of up to 40% towards the parkland obligation, could be available for private open space(s) within the subdivision that meets the standard requirements listed in MHMC Section 17.28.130.

2. **Impact Fees & Fee Increase:** The City of Morgan Hill, pursuant to MHMC Chapter 3.56, has established impact fees to finance the cost of improvements required by new development. MHMC Section 3.56.050 provides for automatic annual (January 15th) adjustment of those fees in existence utilizing the Engineering News Record Index for the preceding twelve months. The City maintains historical records on the Engineering News Record Index. These records are available for inspection during normal business hours. **(MHMC 3.56.010; 3.56.030; 3.56.050)**
   a. The developer shall pay all applicable impact fees and other engineering review fees (fees other than impact fees are automatically adjusted annually on July 1st) prior to building permit issuance and building final. The fees shall be based on the Public Works Fee Schedule prepared by Land Development Engineering. The estimated total amount of impact fees and engineering review fees for this project based on the Fee Schedule currently in effect is **$1,100,000** without any credits applied. Since this project is not subject to the updated Water Capacity fees, which became effective on 5/15/2023, the fee amount includes the previous Water Impact Fee.

D. **Urban Service Area (USA) and Annexation Agreement Requirements**

1. Under Section 1.1 (Municipal Well Site) of the Urban Service Area (USA) and Annexation Agreement, the property owner was required to irrevocably offer for dedication to the City (at no cost to the City) a useable municipal water well site. The well site that was accepted by the City is the site of the City's current

East Main Avenue Well No. 3. The property owner has addressed this requirement.

2. Under Section 1.2 (Watsonville Road Asphalt Overlay) of the Urban Service Area (USA) and Annexation Agreement, the property owner was required to provide an asphalt overlay on the project site's entire Watsonville Road frontage, including shoulders, to a minimum asphalt depth of two inches. To date, the property has not performed the asphalt overlay work. The City previously performed pothole repair work along the project's Watsonville Road frontage.
   a. At improvement plan stage, the project shall address the following:
      i. In lieu of the previously required asphalt overlay, revise the project plans to show a full section replacement for both eastbound and westbound Watsonville Road.
      ii. The project shall evaluate the pavement condition along Watsonville. Refer to Street Improvement condition that follows. The final scope of pavement work will be determined after the pavement condition evaluation.
      iii. If the cost of the full section work along Watsonville Road from the centerline to the northern edge of pavement exceeds the cost of the asphalt overlay required in the Urban Service Area (USA) and Annexation Agreement, the property owner may request further discussion with the City on the scope and cost of the pavement work.

E. **Final Map:** The project's tract/final map shall be approved by the City Council prior to issuance of a grading permit. **(MHMC 17.20.390; 17.24.210)**

1. At final map stage, the project shall address the following:
   a. Show a street name for the new public street labeled as "Court A" that is approved by the Planning Division.
   b. Add to the Owner's Statement a statement regarding the proposed "Private Open Space Easement." Include in the description of the Private Open Space Easement the prohibition of buildings and permanent structures.

F. **Right-of-Way and Easements**

1. Watsonville Road Dedication: The project shall dedicate a total of 46 feet from centerline of public right-of-way on Watsonville Road. **(MHMC 12.02.010; 12.02.50; 12.02.080; 12.02.90; 12.02.100; 17.28.010)**

2. Santa Teresa Boulevard Re-Dedication in Fee: The project shall verify if the 55 feet from the centerline of Santa Teresa Boulevard to the property has been dedicated in fee to the City. If the dedication was not in fee, the project shall re-dedicate to the City in fee a total of 55 feet from centerline of public right-

of-way on Santa Teresa Boulevard. The re-dedication shall be included on the Final Map.

3. Easements: The 48' street sections shall have a Public Service Easement (PSE) with a minimum width of 14' on both sides of the street.

4. Vacation of Right-of-Way: The existing cul-de-sac bulb at Secretariat Way (public right-of-way) is proposed to be vacated. The right-of-way shall be vacated through a Summary Vacation to be approved by the City Council. The copy of Resolution to Vacate and conveyance shall be recorded at the County Recorder's Office prior to the first building final.
   a. At building permit stage, the Developer shall submit a plat and legal description of the right-of-way to be vacated.

G. **Guidelines and Standards for Land Use Near Streams**: The project shall comply with the City's adopted Santa Clara Valley Water Resource Protection Collaborative's "Guidelines and Standards for Land Use Near Streams". A copy of the guidelines and standards can be found at https://www.valleywater.org/contractors/doing-businesses-with-the-district/permits-for-working-on-district-land-or-easement/guidelines-and-standards-for-land-use-near-streams.

H. **Permits/Approvals from Other Agencies**:

1. Santa Clara County Roads and Airports:
   a. At improvement plan/building permit stage, the Developer shall submit the improvement plans to Santa Clara County Roads and Airports for review and approval of the following work within the County's Right-of-Way:
      i. Undergrounding of existing overhead utility lines.
      ii. Roadway widening and improvements along Watsonville Road.
   b. Prior to building permit issuance, the developer shall obtain an Encroachment Permit from Santa Clara County Roads and Airports for any offsite improvements within the County's Right-of-Way.

2. Valley Water: At grading permit/improvement plan stage, the Developer shall submit the project's improvement plans for review by Valley Water.

I. **Utilities**

1. All new water main installations (public and private) shall adhere to the separation criteria established by the California Waterworks Standards (California Code of Regulations (CCR), Title 22, Division 4, Chapter 16, Section 64572). Any proposal for alternative compliance to these

requirements shall be submitted to the State Water Resources Control Board Division of Drinking Water.

2. At improvement plan stage, a detailed review of the utilities will be performed.

J. **Street Improvements**

1. At improvement plan stage, the project shall submit a separate Offsite Improvement Plan set (including the Offsite Landscape Plans) to Land Development Engineering. The Onsite Improvement Plans shall be submitted to the Building Division as part of the project's grading/building permit application.

2. Pavement Condition: The project may be required to evaluate the pavement condition of Watsonville Road and Santa Teresa Blvd and improve the streets, as necessary, to meet current City standards for arterial streets. Evaluation may involve pavement core sampling at multiple locations to the satisfaction of the City Engineer.

    a. If the existing pavement condition does not meet current City Standards, the project shall remove and replace the existing section of asphalt concrete pavement on Watsonville Road and Santa Teresa Blvd. The minimum street improvement on Watsonville Road shall be a two-inch removal and replacement of the existing asphalt concrete pavement along the entire property frontage and up to the street centerline. The minimum street improvements along Santa Teresa Blvd will be determined at improvement plan stage after pavement condition evaluation.

3. The project is proposing to construct roadway improvements that will change the existing crown on Watsonville Road. The change in existing cross-slopes and the crown on Watsonville Road at the southerly limit may result in unintended nuisance ponding and drainage issues between the proposed improvements and the road outside of the project limits. At improvement plan stage, the plans shall address any nuisance ponding and drainage issues at Watsonville Road.

4. The City's current, adopted Capital Improvement Plan includes a round-a-bout or traffic signal improvements at the intersection of Watsonville Road and Santa Teresa Boulevard. Design for these improvements is anticipated to start Spring 2025, with the construction estimated to start Summer 2026.
    a. At improvement plan stage, the project shall coordinate with the City the design of the project's offsite improvements approaching and adjacent to the intersection.

b. The intersection layout and required improvements along the project's frontage shall be finalized at improvement plan stage.
c. The City will coordinate construction schedules between the intersection improvements and the project at improvement plan stage.

5. The project shall provide a 48' street section with 5-foot detached sidewalk and 5-foot park strip on both sides of all new streets. Use a City standard minimum TI of 7 for the typical 48' street section and minimum TI of 9 for Watsonville Road.

6. The subdivision's future HOA/property owners shall be responsible for maintaining the project's detached sidewalks. The CCRs shall reflect this responsibility.

7. At improvement plan stage, in accordance with the City's Street Tree Master Plan, the City Engineer or designee shall select the acceptable street tree species and spacing.

STANDARD CONDITIONS:
GENERAL

A. **Final Map:** The applicant shall have a Final Map prepared by a registered engineer (licensed prior to 01/01/1982: registration number 33,965 or lower) or licensed land surveyor delineating all parcels and easements created. There shall be concurrence in writing by PG & E, Telephone, Cable TV and any other affected agencies to all improvements and easements which are applicable to them. The number and locations of monuments shall be set as required by the City Engineer. **(MHMC 17.20.200 A; 17.20.290; 17.24.010)**

B. **Public and Private Improvements:** The applicant shall cause the construction of all public and private improvements in accordance with the latest City Standard Drawings and Specifications. **(MHMC 12.02.090 A; 17.32.010 A)**

C. **Improvement Plans:** The applicant shall submit as part of the improvement drawings for the project, profiles of all improvements in the subdivision and typical cross-sections of all streets and details of curbs, gutters, and sidewalks, to be accomplished to the satisfaction of the City Engineer prior to submittal of Final Map. **(MHMC Sec 17.32.060 B; 17.32.070; 17.32.080 A)**

1. Improvement plans are to show water lines, sanitary sewer, storm drain system, pavement widths, curve radius, and existing utilities.

D. **Encroachment Permits:** Obtain necessary encroachment permits from:
☒ City of Morgan Hill

☒ Santa Clara County Roads and Airports

and provide guarantee covering off-site improvements. **(MHMC 12.08.040 A; 12.08.090)**

E. **Subdivision Improvements Agreement:** Enter into Subdivision Improvements Agreement with the City of Morgan Hill to cover required improvements. **(MHMC 12.02.150; 17.32.010 B; 17.32.160)**

STREET IMPROVEMENTS

F. **Public and Private Streets**: The applicant shall cause the design and construction of all new public and private streets serving the project. The design of all new public and private streets shall be consistent with the General Plan Land Use and Circulation Element as well as the Street Standard Details as contained within the Public Works Standards Details. The construction of the streets shall be undertaken to the lines and grades and in a manner satisfactory to the City Engineer. All street improvements shall be constructed to the satisfaction of the City Engineer. The timing of the improvements will be determined by the City. **(MHMC 12.02.010; 12.02.090; 17.32.060 B; CMH General Plan; CMH Design Standards and Standard Details for Construction)**

G. **Installation and Dedication of Streets**: The project shall install and dedicate street improvements including, but not limited to, curb and gutter, sidewalk, compaction, street paving, oiling, storm drainage facilities, sewer and water, fire protection, undergrounding of utilities and street lighting in conformance with City of Morgan Hill requirements. **(MHMC 12.02.010; 12.02.50; 12.02.080; 12.02.100; 17.28.010; 17.32.060)**

H. **Corner Cutoff**: The project shall dedicate the required corner cutoff at the intersection of Watsonville Road and Santa Teresa Boulevard. **(MHMC 12.02.010; 12.02.50; 12.02.080; 12.02.100; 17.28.010)**

I. **Underground Existing Utilities**: All existing overhead utilities adjacent to any site boundary or along any street frontage of the site shall be placed underground in accordance with City standards and affected utility company guidelines. **(MHMC 12.02.090 B; 17.32.020 E.1)**

SANITARY SEWER SYSTEM

J. **Design of Sewer Improvements**: The applicant shall cause to be undertaken the design and construction of sanitary sewer improvements including, but not limited to installation of sewer line extension on the proposed public street(s) or private street(s)/drive aisle(s). The sanitary collection system shall include, but not be limited to manholes with manhole frames and covers, cleanouts, wye-branches

and laterals, and separate sewer taps to each lot. These are to be installed by the developer. **(MHMC 13.20.355; 17.32.020 C; CMH Sewer System Master Plan; CMH Design Standards and Standard Details for Construction)**

K. **Sewer Connection**: All existing and future sewer lines shall be tied into the City's system and existing septic systems shall be abandoned in accordance with City requirements. **(MHMC 13.24.060; 17.32.20 C)**

STORM DRAIN SYSTEM

L. **Storm Drainage Study**: A complete storm drainage study of the proposed development must be submitted showing amount of run-off, and existing and proposed drainage structure capacities. This study shall be subject to review and approval by the City Engineer. All needed improvements will be made by the applicant. No overloading of the existing system will be permitted. **(MHMC 17.32.020 B;17.32.090; CMH Design Standards and Standard Details for Construction)**

M. **Storm Drainage Design**: The applicant shall cause the design and construction to be undertaken for a storm drainage collection system shown on the Tentative Map/Design Review plans. All storm drain improvements shall be constructed to the satisfaction of the City Engineer. **(MHMC 17.32.020 A & B)**

N. **Storm Drainage Capacity**: Collection system shall be designed to be capable of handling a 10-year storm without local flooding. On-site detention facilities shall be designed to a 25-year storm capacity. Streets shall be designed to carry 100-year storm. Items of construction shall include, but not be limited to installation of storm line extension on proposed public street(s), surface and subsurface storm drain facilities, manholes with manhole frames and covers, catch basins and laterals. Note: the project may be required to **retain** stormwater runoff as part of resolution R3-2013-0032 prior to releasing discharge rates at pre-development flows. **(MHMC 17.32.020 B; 18.74.440; CMH Design Standards and Standard Details for Construction; CMH Storm Drainage System Master Plan)**

O. **Storm Drainage General Requirements:** Prior to issuance of a grading permit, the applicant shall complete the following to the satisfaction of the City Engineer.

1. Storm drain calculations to determine detention/retention pond sizing and operations.
2. Plan describing how material excavated during construction will be controlled to prevent this material from entering the storm drain system.
3. Water Pollution Control Drawings (WPCD) for Sediment and Erosion Control.

(**CMH Design Standards and Standard Details for Construction)**

P. **Valley Water Dedications:** Where the project adjoins existing Valley Water facilities, applicant shall obtain dedication(s) of all necessary easement or right-of-way to accommodate established ultimate facilities master plan.

Q. **NPDES Construction Activity General Permit/SWPPP Requirements**: As required by the State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ, construction activity resulting in a land disturbance of one (1) acre or more of soil, or whose projects are part of a larger common plan of development that in total disturbs more than one (1) acre, are required to obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 for Discharges of Storm Water Associated with Construction Activity (General Permit). To be permitted with the SWRCB under the General Permit, owners must file a complete Notice of Intent (NOI) ONLINE at: http://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp and develop a Storm Water Pollution Prevention Plan (SWPPP) Manual in accordance with the General Permit. The SWPPP Manual shall follow the CASQA SWPPP template/format at https://www.casqa.org/store/products/tabid/154/p-167-construction-handbookportal-initial-subscription.aspx and shall be approved by Public Works Engineering. A Waste Discharger Identification (WDID) number to be issued to the construction site after the SWRCB receives and verifies the submitted ONLINE NOI information. The WDID number and approved SWPPP Manual shall be provided to Public Works and the Building Department prior to any approval of grading activities **(SWRCB NPDES General Permit CAS000002).**

R. **NPDES General Permit Site SWPPP Inspections and Compliance:**

1. ALL project onsite and offsite construction activity shall have the site inspected by a **qualified third party SWPPP Inspector (QSD or QSP or RCE).**
2. SWPPP Inspections shall occur weekly during the rainy season (September 15th thru May 1st).
3. SWPPP Inspections shall occur bi-weekly during the non-rainy season.
4. 48 hours prior to and following a forecasted rain event, SWPPP Inspections shall occur in addition to those of items 2 or 3 above.
5. Per each of the inspection conditions 2, 3, or 4, SWPPP inspection reports, and when applicable, Rain Event Action Plans (REAPS) shall be e-mailed to: sw.construction@morganhill.ca.gov no later than 12:00 PM each Monday for the previous week's inspections with a brief statement whether the site is in compliance or non-compliant.
6. Prior to rain events, BMPs not in compliance will need to be corrected immediately.
7. Illicit discharges per the NPDES General Permit, non-compliance of tracking control, and inlet protection within the public right-of-way shall be addressed immediately.
8. Other non-compliance issues need to be addressed within a 24-hour period.

9. Non-compliance issues which have been corrected shall be verified by NPDES SWPPP Inspector by a follow-up inspection.
10. BMP maintenance/inspections shall include tree protection, if applicable.

S. **Private Storm Drain Connection to Public Storm Drain System**

1. Prior to connection of the private storm drain to the public storm drain system, the point of connection shall be inspected by the City's Environmental Services staff. Developer/Applicant shall contact SW Construction at SW.construction@morganhill.ca.gov for the inspection.
2. Prior to acceptance of public improvements or occupancy of the final unit, the private storm drain facilities shall be inspected by Civil Engineer of record and the City's Environmental Services staff. If necessary, storm drainpipe, inlets, post-construction stormwater control measures, and detention facilities, shall be cleared of foreign debris, sediment or silt.

WATER SYSTEM

T. **Domestic Water System**: The applicant shall cause the design and construction to be undertaken of a domestic water system to the satisfaction of the City Engineer. The water system improvements shall be constructed within public easements or street rights-of-way to the satisfaction of the City Engineer and dedicated to the City. **(MHMC 17.32.020 A & D; CMH Design Standards and Standard Details for Construction; CMH Water System Master Plan)**

U. **Water Well Abandonment**: Abandonment of any existing water well shall be in conformance with Santa Clara Valley Water District (SCVWD) Ordinance 90-1. Location and disposition to be shown on the plan. Well(s) shall be properly registered with the SCVWD and either be maintained or abandoned in accordance with SCVWD standards.

V. **Water Line Extension**: Install water line extension on the proposed public streets and/or private streets. **(MHMC 17.32.020 A & D; CMH Water System Master Plan)**

W. **Water Meters:** Provide separate water services and meters for each lot. These are to be installed by developer. **(MHMC 17.32.020 D)**

OTHER CONDITIONS

X. **Easement Dedications**: The owner shall dedicate all necessary utility easements. **(MHMC 12.02.080 D; 17.28.010 A)**

Y. **Undergrounding New Utilities:** The applicant shall cause the design and construction required to underground all electric, gas, Cable TV and

communication lines within the development. Such design and construction shall be to the satisfaction of the affected utilities and the City Engineer. **(MHMC 17.32.020 E.1)**

Z. **Landscaping and Irrigation Systems**: Landscaping and irrigation systems serving common areas that are required to be installed in the public right-of-way on the perimeter of this project shall be continuously maintained by the property owner or designated maintenance entity.

AA. **Final Landscape Plans**: Final landscape plans shall be submitted with and included as part of the improvement plans for the project. **(MHMC 17.08.090)**

BB. **Pre-construction Meeting**: Prior to the approval of any Building Permit for grading activity, the developer shall schedule a pre-construction meeting with the Public Works Inspection Division with the following project team members:

1. Civil Engineer of record
2. Geotechnical Engineer of record
3. Third Party QSD/QSP SWPPP Inspector
4. General Contractor
5. Sub-Contractors

CC. **As-Built Submittal Standards**: The developer shall submit digital as-builts of the project's Final Map, Grading Plan, and Improvement Plans which adhere to the City's updated GIS/CAD Developer Submittal Standards.

NPDES STORMWATER MANAGEMENT DEVELOPMENT STANDARDS

DD. **Stormwater Post Construction Requirements (PCRs)**: Project shall comply with the California Regional Water Quality Control Board Central Coast Region Resolution No. R3-2013-0032 as documented by the **Stormwater Management Guidance Manual for Low Impact Development and Post-Construction Requirements** (developed from Resolution No. R-2013-0032 Attachment 1 and 2 at: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml). A copy of the Guidance Manual can be obtained from the City's Land Development Engineering webpage. Project shall provide Stormwater Runoff Management Plan, Stormwater Control Plan and Checklist, and applicable calculations per the Guidance Manual. Project shall meet the applicable Post-Construction Requirements:

1. Performance Requirement 1: Site Design and Runoff Reduction
2. Performance Requirement 2: Water Quality Treatment
3. Performance Requirement 3: Runoff Retention
4. Performance Requirement 4: Peak Management

EE. **Peak Storm Water Runoff Discharge Rates**: Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion. Note: the project may be required to **retain** stormwater runoff as part of resolution R3-2013-0032 prior to releasing discharge rates at pre-development flows.

FF. **Storm Drain System Stenciling and Signage**: All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: “NO DUMPING – DRAINS TO CREEK”) and/or graphical icons to discourage illegal dumping. Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area. Legibility of stencils and signs must be maintained.

GG. **Design Standards for Structural or Treatment Control BMPs**: The post-construction treatment control BMPs shall incorporate, at a minimum, either a volumetric or flow- based treatment control design standard, or both, as identified below to mitigate (infiltrate, filter or treat) storm water runoff:

1. Volumetric Treatment Control BMP
    a. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or
    b. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/ Commercial, (2003); or
    c. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for “treatment” that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.
2. Flow Based Treatment Control BMP
    a. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the area; or
    b. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

HH. **Stormwater Runoff Management Plan (SWRMP)**: The Stormwater Runoff Management Plan shall include sufficient information to evaluate the environmental characteristics of affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures (post construction BMPs) proposed for managing stormwater runoff.

1. The Stormwater Runoff Management Plan shall be prepared under the direction of a professional civil engineer registered in the State of California. The responsible professional civil engineer shall stamp and sign the approved Stormwater Runoff Management Plan.
2. The developer shall provide a signed certification from the civil engineer responsible for preparing the Stormwater Runoff Management Plan that all stormwater best management practices have been designed to meet the requirements.

II. **Stormwater BMP Operation, Maintenance, and Replacement Responsibility**

1. Prior to building final, the property owner shall submit a signed certification (with signature, date & license number/seal) certifying that all post-construction stormwater management/BMP facilities shown on the as-built drawings were inspected by the civil engineer (or by a qualified third-party stormwater inspector hired by the permittee/owner) and have been constructed in accordance with the approved plans and specifications.
2. All on-site stormwater management facilities shall be operated and maintained in good condition and promptly repaired/replaced by the property owner(s), an owners' or homeowners' association or other legal entity approved by the City.
3. Any repairs or restoration/replacement and maintenance shall be in accordance with City-approved plans.
4. The property owner(s) shall develop a maintenance schedule for the life of any stormwater management facility and shall describe the maintenance to be completed, the time period for completion, and who shall perform the maintenance. This maintenance schedule shall be included with the approved Stormwater Runoff Management Plan.

JJ. **Stormwater BMP Inspection Responsibility**

1. The property owner(s) shall be responsible for having all stormwater management facilities inspected for condition and function by a **certified Qualified Stormwater Practitioner (QSP)**.
2. Unless otherwise required by the City Engineer or designee, stormwater facility inspections shall be done at least twice per year (April 15th and September 15th) by the QSP. Written records shall be kept of all inspections and shall include, at minimum, the following information:
   a. Site address;
   b. Date and time of inspection;
   c. Name of the person conducting the inspection;
   d. List of stormwater facilities inspected;
   e. Condition of each stormwater facility inspected;
   f. Description of any needed maintenance or repairs; and
   g. As applicable, the need for site re-inspection.
3. Upon completion of each inspection, an inspection report shall be submitted to the Environmental Services Division.

KK. **Records of Maintenance and Inspection Activities**: On or before April 15th and September 15th of each year, the party responsible for the operation and maintenance of on-site stormwater management facilities under the BMP Operation and Maintenance Agreement shall provide the City Engineer or designee with records of all inspections, maintenance and repairs.

LL. **Annual Certification of SWRMP**: On or before September 30th of each year, a Registered Civil Engineer (RCE) shall provide written certification that the project's stormwater quality design standards are properly maintained and functioning as required by the SWRMP

BUILDING DIVISION

A. **California Code of Regulations:** The future residential homes as part of the Project shall be designed to comply with the edition of the California Codes of Regulations as amended by the Morgan Hill Municipal Code Title 15 that is in effect at time of Building Permit Application submittal.

FIRE DIVISION

A. **Proposal limited to:** Review of this Development proposal is limited to acceptability of site access as they pertain to fire department operations, and shall not be construed as a substitute for formal plan review to determine compliance with adopted model codes. Prior to performing any work, the applicant shall receive approval of a Design Permit by Planning and make application to the Building Department for all applicable construction permits.

HOUSING DIVISION

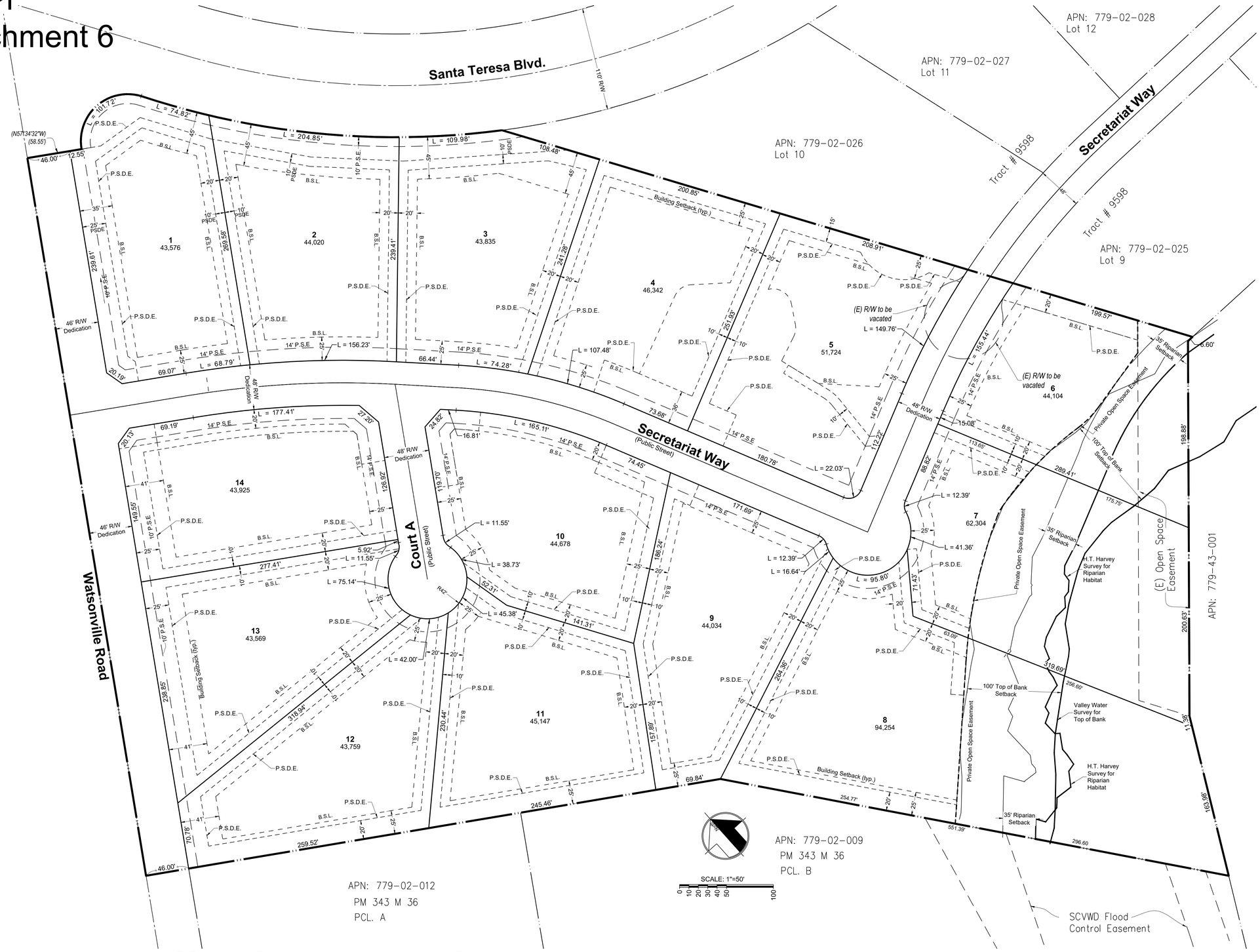
A. **Inclusionary Housing Agreement:** The developer shall execute and record an Inclusionary Affordable Housing Agreement with the City prior to the recordation of the final map. **(MHMC 14.04.050)**

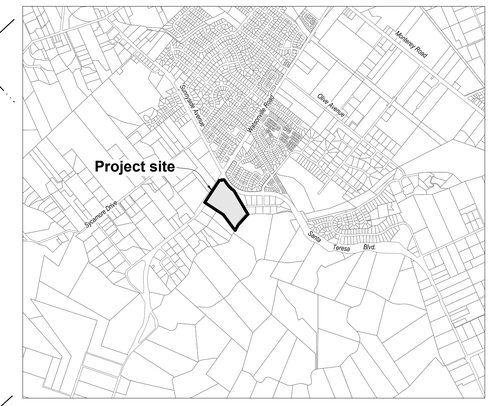
B. Pursuant to the City's Inclusionary Housing Ordinance (Morgan Hill Municipal Code Title 14, Chapter 14.04), developers of residential projects in the City are required to either construct a specified percentage of affordable housing units on-site within the project or comply with the Inclusionary Housing Ordinance by satisfying an alternative means of compliance as set forth in Section 14.04.070 of the Ordinance.

1. If the developer chooses, the housing in-lieu housing fee may be paid in-lieu of building inclusionary units because this is a custom lot project as provided in MHMC Section 14.04.070D.1.c. In-lieu fees shall be paid prior

to issuance of building permits for the market-rate units in this residential project.

2, If the developer chooses to build the required units, the Below Market Rate unit(s) shall comply with the BMR standards as described in MHMC Section 14.04.040.F.





Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1/PD
PROPOSED ZONING:	RE-1/PD
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

Density Calcs:

TOTAL PROJECT AREA:	18.540 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	16.111 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement
B.S.L.	Building Setback Line

quail vineyards

tentative map

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 10/07/24 DRAWN:RS CHECKED: WJM

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of 7
25268.2

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Abbreviations:

P.S.D.E.	Private Storm Drainage Easement
P.S.E.	Public Service Easement
R/W	Right of Way
S.D.E.	Storm Drainage Easement

Abbreviations:

APN- ASSESSOR PARCEL NUMBER
EX- EXISTING
TBR- TO BE REMOVED

Building Coverage Calcs:

PROJECT NET AREA:	14.878	ACRES
BUILDING COVERAGE:	1.151	ACRES
% BUILDING COVERAGE:	7.73%	

Density Calcs:

TOTAL PROJECT AREA:	18.390 ACRES
DEDICATED PUBLIC RIGHT OF WAY:	2.429 ACRES
PRIVATE OPEN SPACE:	2.528 ACRES
PROJECT NET ACREAGE:	14.878 ACRES
NO. UNITS ALLOWED:	14
NO. UNITS PROPOSED:	14

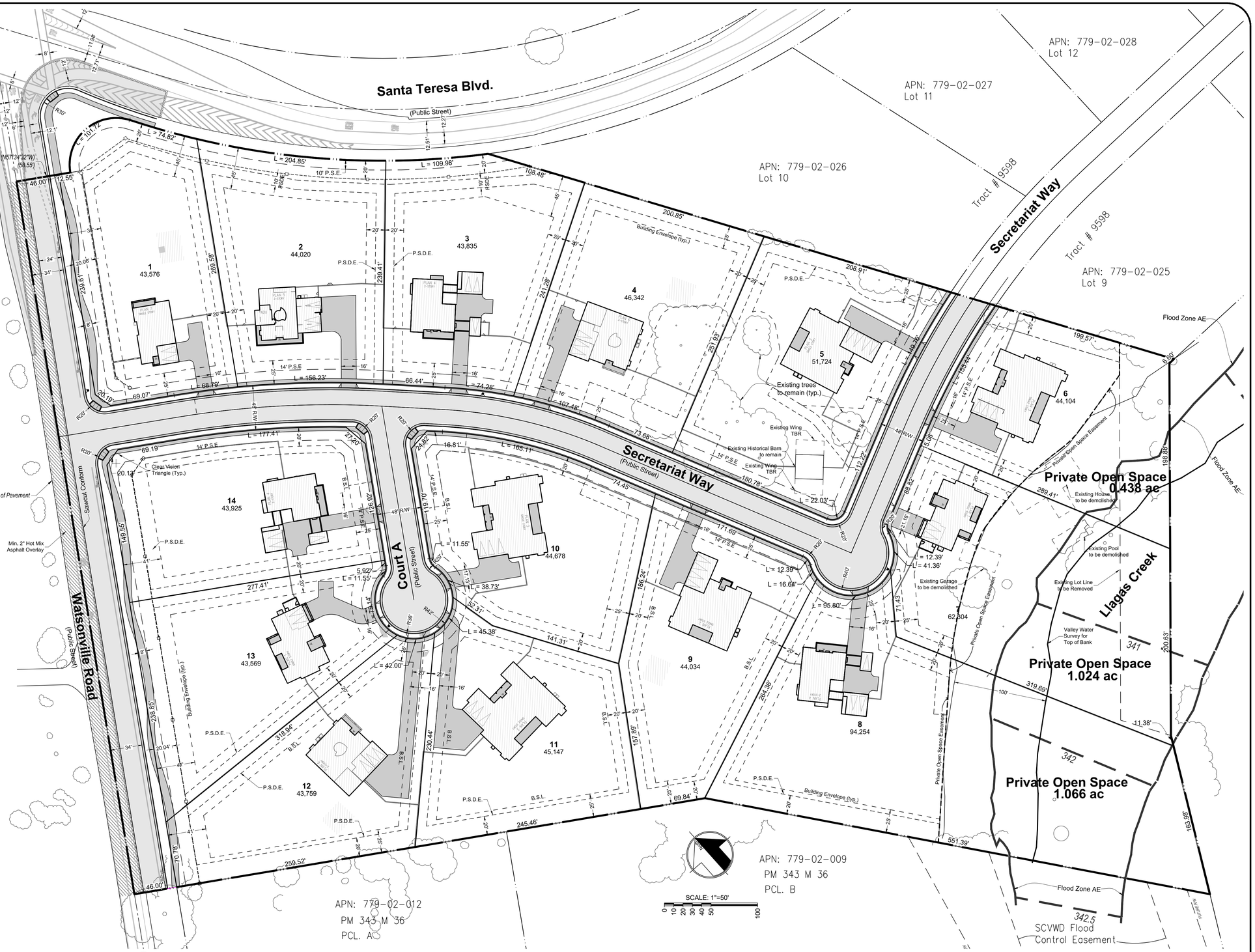
Notes:

ASSESSOR'S PARCEL NO:	779-02-023
PRESENT USE:	RESIDENTIAL
PROPOSED USE:	RESIDENTIAL
PRESENT ZONING:	RE-1 (RPD)
PROPOSED ZONING:	RE-1 (RPD)
SANITARY SEWER:	CITY OF MORGAN HILL
GAS and ELECTRIC:	PG&E
WATER:	CITY OF MORGAN HILL
TELEPHONE:	VERIZON
EXISTING IMPROVEMENTS:	AS SHOWN
GENERAL PLAN:	SINGLE FAMILY LOW DENSITY

	Building Coverage Calculations		
Lot #	Lot Area (SF)	Building Area (SF)	Building Coverage (%)
1	43,576	2035	4.67%
2	44,020	3247	7.38%
3	43,835	3822	8.72%
4	46,342	3664	7.91%
5	51,724	5093	9.85%
6	44,104	5647	12.80%
7	62,304	3412	5.48%
8	94,254	3822	4.06%
9	44,034	5093	11.57%
10	44,678	5647	12.64%
11	45,147	5647	12.51%
12	43,759	3847	8.79%
13	43,569	3412	7.83%
14	43,925	3822	8.70%

# of times the plan occurs	
Plan 1	2
Plan 2	2
Plan 3	3
Plan 4	3
Plan 5	1
Plan 6	2
Plan 7	1

Lot#	# of Stories	Plan#	Total Living SF	BD	BA
1	Single Story	7	2035	4	3
2	2-Story	5	4620	4	3.5
3	2-Story	4	4279	4	4
4	2-Story	6	5651	5	4.5
5	Single Story	2	3805	4	3.5
6	Single Story	3	4187	4	4
7	Single Story	1	2821	3	3.5
8	2-Story	4	4279	4	4
9	Single Story	2	3805	4	3.5
10	Single Story	3	4187	4	4
11	Single Story	3	4187	4	4
12	2-Story	6	5651	5	4.5
13	Single Story	1	2821	3	3.5
14	2-Story	4	4279	4	4



quail vineyards

site development plan

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

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16075 Vineyard Boulevard Morgan Hill, CA 95037

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Sheet **2** of **7**
25268.2

Benchmark ID: BM 801
S.C.V.W.D.
Elevation: 339.70 (NAVD88)
Description: NGS Steel rod (aluminum box rim stamped "R1458 1990"); at the northeast corner of Watsonville Road and Sunnyside Avenue-Santa Teresa Boulevard; under center of PGE tower #11-75; 0.15 feet lower than rim. City of Morgan Hill.

Date of Ground Survey: 08-05-2008
and 10-15-2022
Date of Drone Survey: 03-15-2022

Tree Study

Tree Id #	Common Name	Species	D.B.H.	Height	Canopy	Condition
12993	Live oak	*Quercus virginiana*	21"	45'	35'	Good
12994	Live oak	*Quercus virginiana*	22"	45'	30'	Good
12995	Live oak	*Quercus virginiana*	16"	40'	25'	Fair
12996	Live oak	*Quercus virginiana*	28"	55'	45'	Good
12997	Live oak	*Quercus virginiana*	24"	60'	40'	Fair
12998	Live oak	*Quercus virginiana*	24"	45'	35'	Good
12999	Bottle tree	*Callistemon viminalis*	35"	55'	45'	Fair
13000	Coastal redwood	*Sequoia sempervirens*	54"	100'	40'	Fair
4121	Deodar cedar	*Cedrus deodara*	39"	60'	50'	Fair
4122	Live oak	*Quercus virginiana*	25"	50'	35'	Fair
4123	Live oak	*Quercus virginiana*	38"	55'	45'	Fair
4124	Modesto ash	*Fraxinus velutina*	28"	75'	50'	Fair
4125	Modesto ash	*Fraxinus velutina*	27"	65'	45'	Fair
4126	Incense cedar	*Calocedrus decurrens*	36"	80'	45'	Good
4127	Modesto ash	*Fraxinus velutina*	31"	56'	60'	Poor
4128	Live oak	*Quercus virginiana*	32"	50'	50'	Excellent
4129	Live oak	*Quercus virginiana*	27"	60'	50'	Fair
4130	Pecan	*Carya illinoinesis*	26"	60'	60'	Poor
4131	Live oak	*Quercus virginiana*	17"	20'	15'	Good
4132	Live oak	*Quercus virginiana*	31"	40'	50'	Excellent
4133	Live oak	*Quercus virginiana*	31"	30'	20'	Fair
4134	Fruitless mulberry	*Morus alba*	23"	25'	35'	Good
4135	English walnut	*Juglans regia*	42"	40'	30'	Poor
4136	Coastal live oak	*Quercus agrifolia*	27"	65'	40'	Fair

Legend

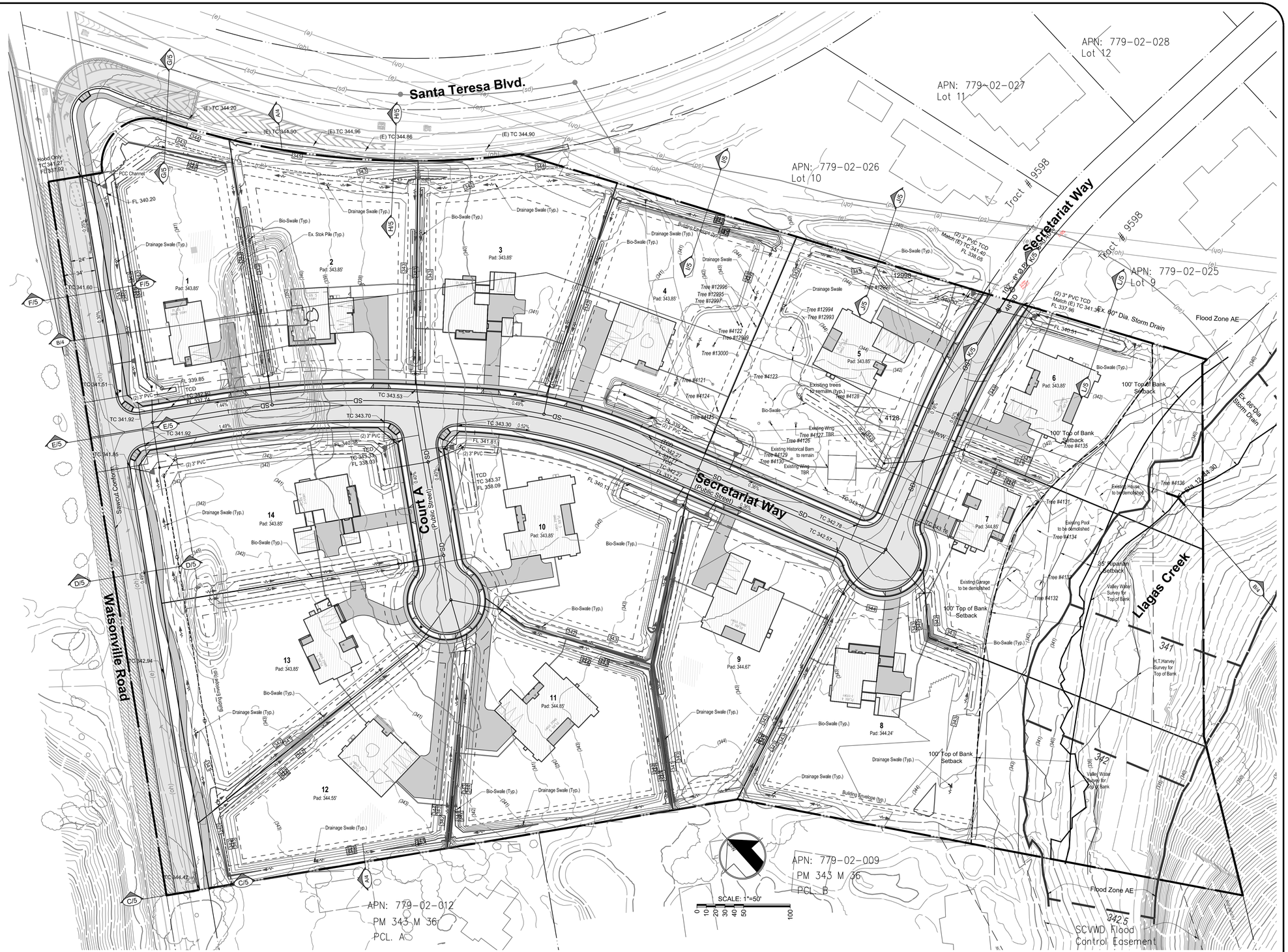
AC PAVEMENT

CONCRETE SIDEWALK/DRIVEWAY APRON

TCD.....Through Curb Drain per std detail S-10

Grading Quantities

Cut (C.Y.)	Fill (C.Y.)	Net (C.Y.)	Max. Cut	Max. Fill
4,241	42,974	38,733 (Import)	3.21'	5.25'



quail vineyards

preliminary grading plan

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GILROY, CA 95020
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16075 VINEYARD BLVD.
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DpC
DEVELOPMENT PROCESS CONSULTANTS
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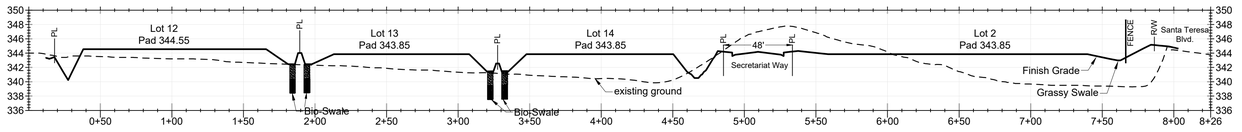
Sheet **3** of **7**
25268.2



PROFILE: Section: A
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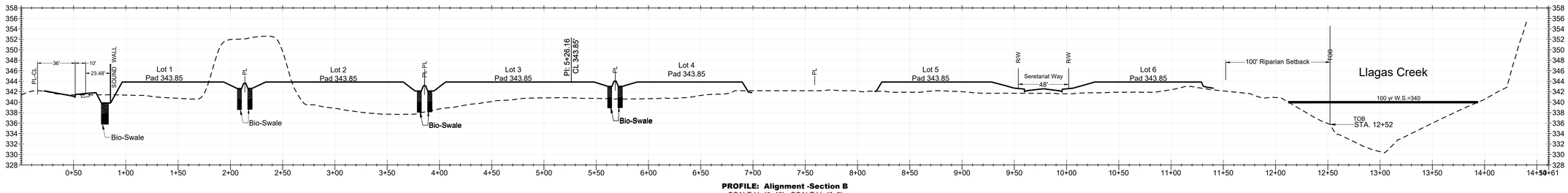

PROFILE: Alignment -Section B
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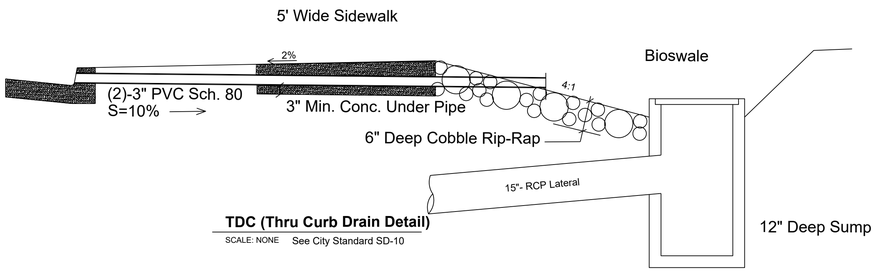
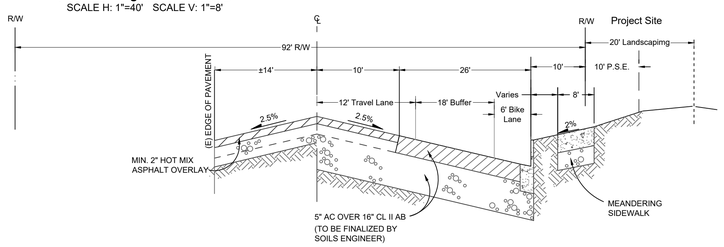
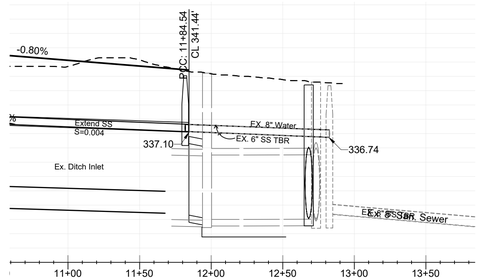


TDC (Thru Curb Drain Detail)
SCALE: NONE See City Standard SD-10



Typical Street Section
WATSONVILLE ROAD
SCALE: NONE T.I.=8



CONFLICT MANHOLE DETAIL and Justification

Two 72" dia. conflict manholes are beig proposed for sanitary sewer conflicts with existing large 60" dia. storm drains in existing Secratariat Drive. 10" dia. steel sleeves are proposed through the storm drain manhole to encase the new 6" dia. PVC sanitary sewer. The sleeve is above the spring line of the 60" storm pipe so the sleeve will not cause debris to plug the pipe. The manhole also provides more conveyance than the pipe so no hydraulic issues will be encountered. One alternative to replacing the existing sewer with conflict manholes is to install a sanitary sewer pump station which is not the "green" solution. A second alternative is to construct the new sanitary sewer line under the existing storm drain in a "siphon" design. There is over 2' of hydraulic "head" to keep the low flows moving. The last alternative is to connect to the existing sanitary sewer stub at it's high elevation and have all other utilities designed below the sanitary sewer. This will require raising the street profile 2' +/- near Watsonville Road with no possibility of being extended.

Broadband Standards

CITY OF MORGAN HILL

For Broadband connectivity, a project is required to install conduits in all the public rights-of-way fronting the project site to accommodate multiple broadband providers. The following standards apply:

A. Design Plans

1. The project is required to submit design plans to include an engineering plan and profile of each street showing the location of existing underground utilities in the proposed path of the broadband conduit installation.
2. The design plans shall also include the approximate locations and dimensions for surface restoration.

B. Broadband Conduit

1. Provide a minimum of two (2) conduits each with at least two pull cables. At least one conduit shall remain empty and reserved for use by a potential future broadband service provider.
2. Each conduit shall be a 4" diameter PVC pipe, non-pressure type but has adequate stiffness for direct burial usage without encasement in concrete. The type of pipe shall be consistent with industry standards and be orange in color.
3. Broadband system designers shall field-verify the locations of existing utilities and surface features along and adjacent to the proposed conduit alignment.
4. The preferred horizontal conduit alignment is at centerline of sidewalk or as approved by the City Engineer.
   a. For conduits allowed in the street: Locate new conduit 3' from face of curb. Conduits shall be located parallel to the street centerline, where practicable, and shall not meander along the street. Street crossings shall be perpendicular to the street centerline.
5. Horizontal Clearance:
   a. Minimum 1' horizontal clearance from new conduit to other existing utilities, excluding water mains, gas lines, and electric lines.

   b. Minimum 3' horizontal clearance from new conduit to existing water main.
   c. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required horizontal separation requirements.
6. All conduits shall be installed underground using directional boring method or open trench.
   a. For Directional Bore Design
      i. Plans shall include a layout plan and profile sheets for directional bores. All existing utilities must be shown to scale on the plan and profile views.
      ii. Vertical Clearance: Provide 3' minimum vertical clearance from all utilities. This includes minor services, such as water services and sewer laterals. For deep crossings, provide a minimum of 5' clearance from utilities and structures. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required vertical separation requirements.
      iii. Boring and Receiving Pits: Show the length, width, depth, and location of the boring and receiving pits on the plans and profiles. The pits are to be located to minimize the construction impact to the adjacent properties and streets. Pits should not be in front of existing driveways, restaurants, bus stops, fire hydrants, and within street intersections.
      iv. Conflicts with Trees: If trees are in the way of the directional bore, the conduit shall be bored 8' to 12' underneath the tree roots rather than around the tree.
   b. For Trench Design
      i. For open-trench construction in the street: Conduit shall have a minimum cover of 36" above the top of the conduit and allow at least 6" between the top of the conduit and the bottom of the street structural pavement section.
      ii. For a trench outside the street section: Conduit shall have a minimum cover of 30".
      iii. Open trenches deeper than 60" must comply with Cal/OSHA standards, requiring protective systems, such as shoring.

      iv. Vertical Clearance: Provide 12" minimum vertical clearance from all other utility lines and services, including other telecommunication lines.
7. Tracer Wire: The conduits shall be installed with a tracer wire.
   a. Install tracer wire in the trench or bore with all underground conduits. Ensure the tracer wire provides end-to-end electrical continuity for electronically locating the underground conduit system.
   b. In a trenching operation, install the tracer wire no more than 3" above the conduit.
   c. In a boring operation, install the tracer wire in an encasement.
8. Identification Tape: A 6" wide, orange magnetically detectable identification tape shall be installed 12 inches above the entire length of the conduit route. The tape shall be continuously imprinted with "BROADBAND CONDUIT".

C. Pullboxes

1. Indicate locations of all pullboxes, other service boxes and manholes on the design plans.
2. Pullboxes shall be a No. 8 pullbox per City of Morgan Hill Standard E-6.
3. Pullboxes and splice boxes shall be located within the park strip/planter strip or at the back of sidewalk unless the City Engineer approves an alternative location.
4. The maximum distance between any two pull boxes shall not exceed 1,200 feet. Within the 1,200-feet distance, provide pullboxes at locations wherever the cumulative change of direction of the conduit exceeds 180 degrees.
5. The minimum bending radius for conduit shall be 3 feet.
6. Pullboxes shall be located a minimum of 12 inches from all structures.

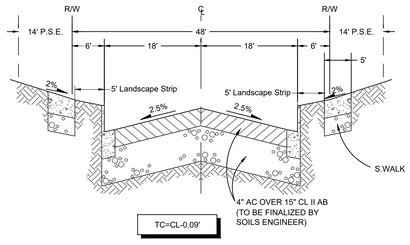
D. Manholes

1. A detail of the manhole must be shown on the plans.
2. Manholes for broadband conduit shall not be allowed in the street unless an exception is granted by the City Engineer.

3. Manholes allowed to be in the street must have cast iron frames and covers.
4. Manholes that are in sidewalks shall have a concrete polymer frame and cover that matches the color and texture of the sidewalk.
5. Manholes shall not be placed within a driveway approach or within the curb return at intersections.
6. All manholes must be rated for a minimum H-20 wheel load.
7. The name "BROADBAND" shall be permanently cast into or engraved on the manhole covers.

E. Related Work

Refer to the City's Design Standards and Standard Details for Construction for pavement materials, trench limits of restoration, backfill for boring, and backfill for trenching.



Typical 48' Street Section
SCALE: NONE T.I.=7 R-VALUE=5

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

quail vineyards

grading cross sections

Geotech Engineer:
Earth Systems

Biologist
H.T. Harvey and Ass.

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2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
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2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

MH engineering Co.
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DATE: 10/07/24 DRAWN:RS CHECKED: WJM

Sheet **4** of **7**
25268.2

Last Modified by: Rita Burgos on 10/7/2024 2:24:24 PM Printed by: Rita Burgos on 10/7/2024 2:24:37 PM
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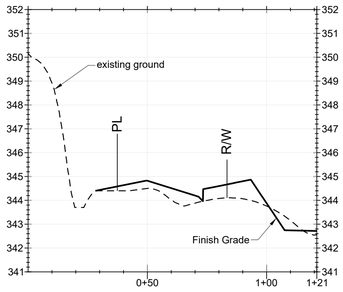

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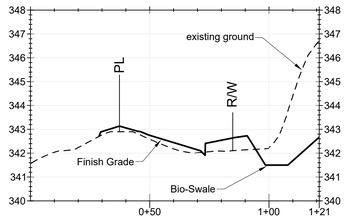

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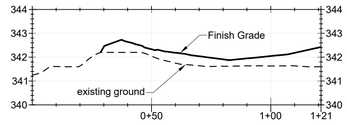

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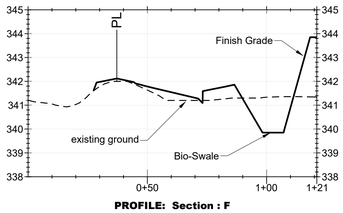

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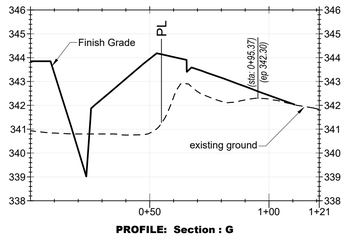

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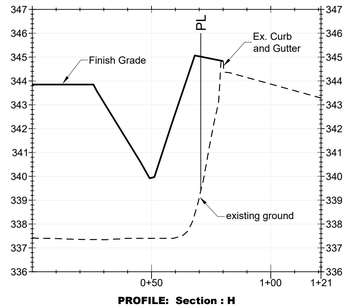

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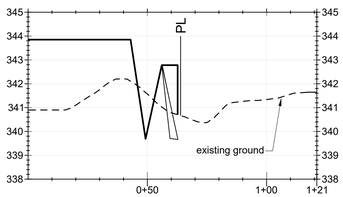

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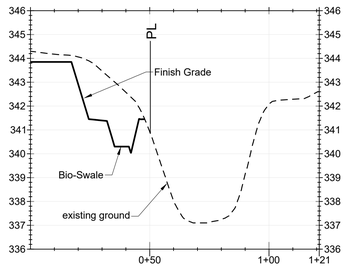

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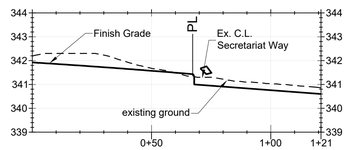

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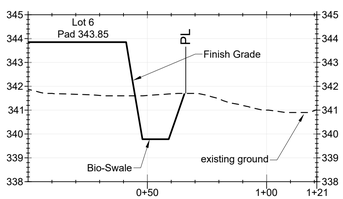

PROFILE: Section : L
SCALE H: 1"=40' SCALE V: 1"=4'

quail vineyards

grading cross sections

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DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
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MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

DATE: 10/07/24 DRAWN:AC CHECKED: WJM

Sheet **5** of **7**
25268.2

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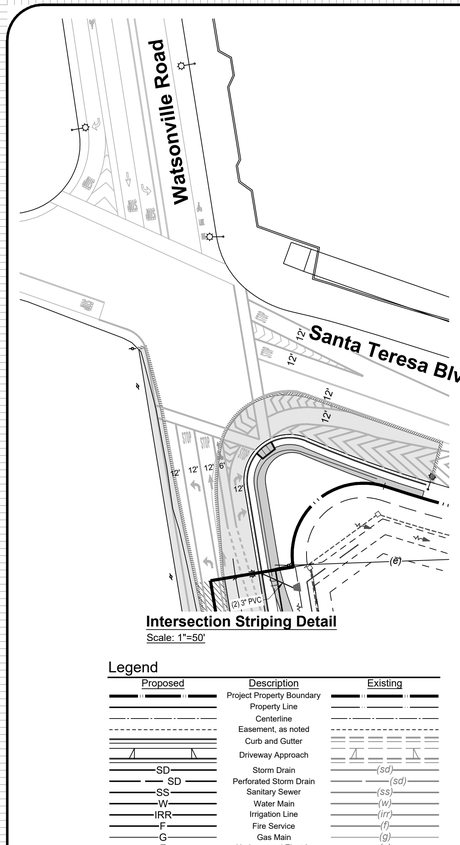


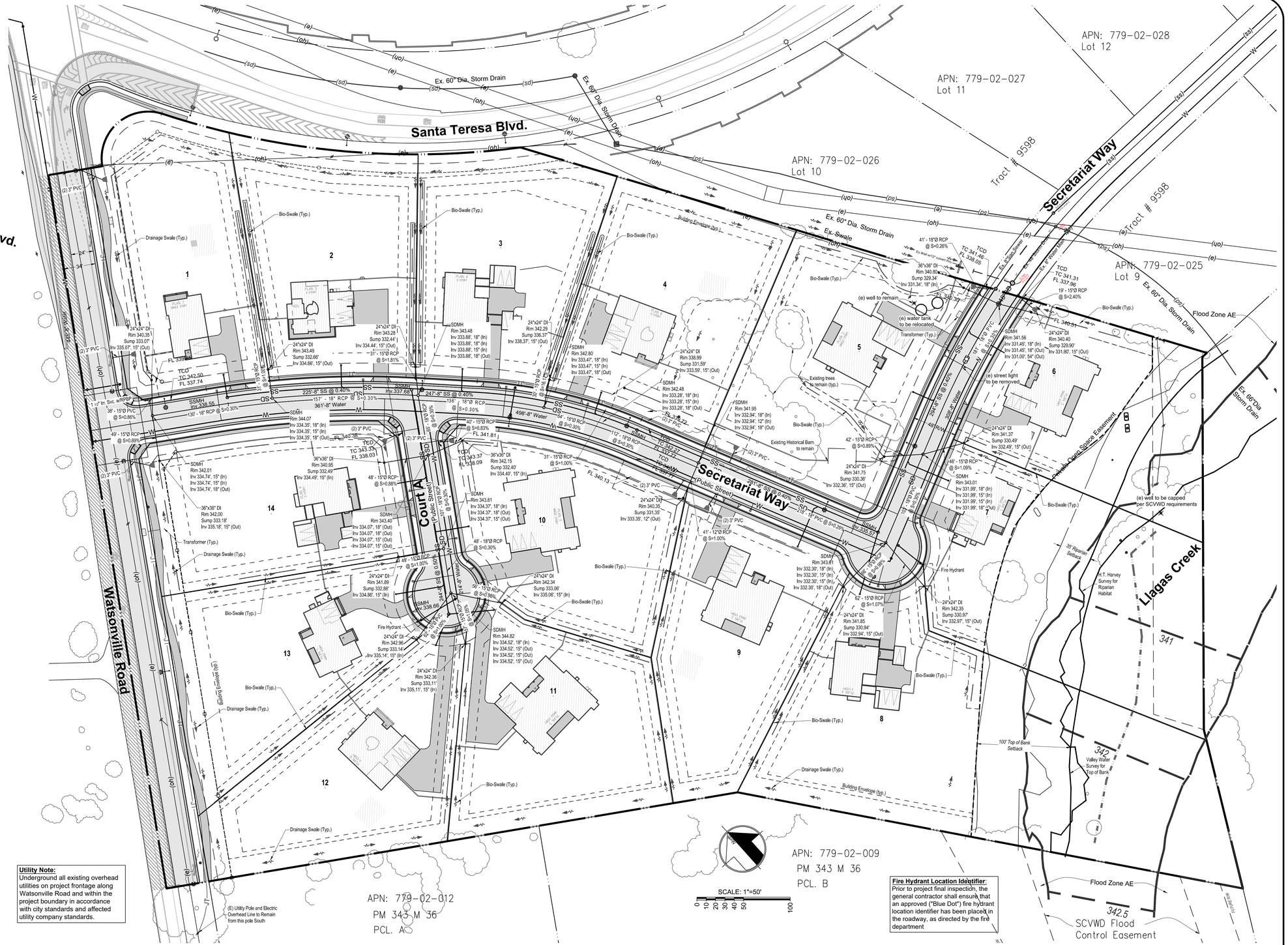
Intersection Striping Detail
Scale: 1"=50'

Legend

Proposed	Description	Existing
	Project Property Boundary	
	Property Line	
	Centerline	
	Easement, as noted	
	Curb and Gutter	
	Driveway Approach	
SD	Storm Drain	(sd)
SD	Perforated Storm Drain	(sd)
SS	Sanitary Sewer	(ss)
W	Water Main	(w)
IRR	Irrigation Line	(irr)
F	Fire Service	(f)
G	Gas Main	(g)
E	Underground Electric	(e)
E OH	Overhead Electric	(e) (oh)
T OH	Telephone	(t) (oh)
JT	Joint Trench/ Broadband	(jt)
	Chainlink Fence	
	Wood Fence	
	Street Barricade	
100	Major Contour	(100)
99	Minor Contour	(99)
	Benchmark	
	Monument, Type as shown	
2	Revision	
B/A	Section	
	Swale	
2.2%	Slope	(2.1%)
SD	Storm Drain Manhole	(sd)
	Curb Inlet	
	Drop Inlet	
SS	Sanitary Sewer Manhole	(ss)
	Fire Hydrant	(fh)
CO	Cleanout	(co)
	Gate Valve	
	Transformer	
	Utility Pole	
	Electrolier	
S	Sewer Service	S
W	Water Service	W
	Transformer	
	AC Pavement	
	AB Areas	
	PCC walks/driveways	
	Structures	
	Bio-Retention Area	
	Decorative Pavers	

** existing features are labeled in italics and parenthesis, typical

Utility Note:
Underground all existing overhead utilities on project frontage along Watsonville Road and within the project boundary in accordance with city standards and affected utility company standards.



Fire Hydrant Location Identifier:
Prior to project final inspection, the general contractor shall ensure that an approved ("Blue Dot") fire hydrant location identifier has been placed in the roadway, as directed by the fire department

quail vineyards

site utility plan

Applicant:
BLACKROCK LLC
2730 LONE OAK CT.
GILROY, CA 95020
(408) 892-8345

Engineer:
MH ENGINEERING
16075 VINEYARD BLVD.
MORGAN HILL, CA 95037
(408) 779-7381

Planner:
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA
SANTA BARBARA, CA 93109
(408) 421-2695

DpC
DEVELOPMENT PROCESS CONSULTANTS
2424 CALLE GALICIA SANTA BARBARA CA 93109
(408) 421-2695 EMAIL: VRBURGOS@HOTMAIL.COM

MH engineering Co.
16075 Vineyard Boulevard Morgan Hill, CA 95037

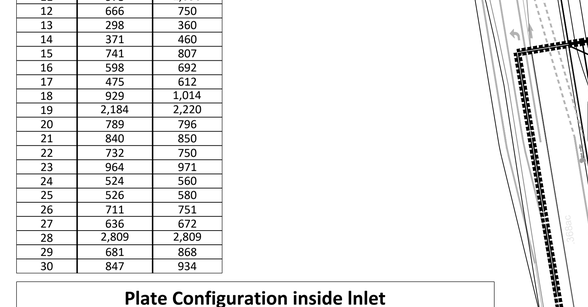
DATE: 10/07/24 DRAWN:RS CHECKED: WJM

Bio-Swale Area table

DMA NO.	Required Bio-swale area (sf)	Provided Bio-swale area (sf)
1	2,242	2,558
2	643	680
3	711	720
4	586	600
5	681	780
6	576	640
7	631	640
8	2,065	2,093
9	1,147	1,202
10	892	1,175
11	973	1,050
12	666	750
13	298	360
14	371	460
15	741	807
16	598	692
17	475	612
18	929	1,014
19	2,184	2,220
20	789	796
21	840	850
22	732	750
23	964	971
24	524	560
25	526	580
26	711	751
27	636	672
28	2,809	2,809
29	681	868
30	847	934

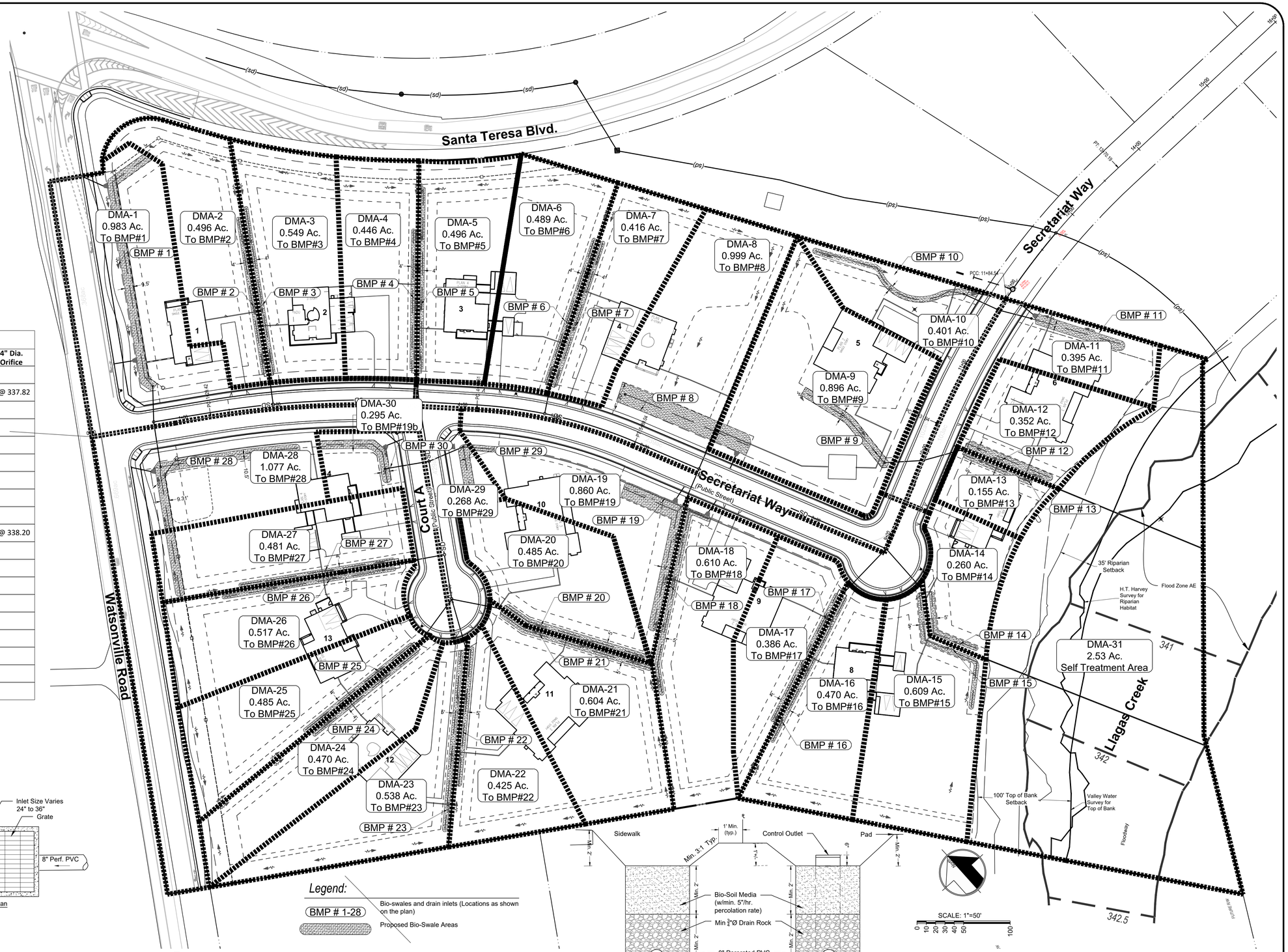
Plate Configuration inside Inlet

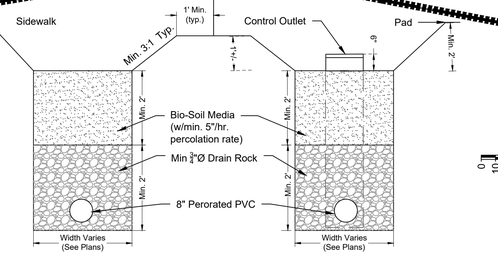
DMA No.	Grate	Top of Plate Elev.	1" Dia. Orifice	2" Dia. Orifice	3" Dia. Orifice	4" Dia. Orifice
1	2' by 2' @ 340.33	340.00	4 @335.83	1 @339.20	2 @ 339.80	
2 & 3	2' by 2' @ 341.02	340.00			2 @ 336.52	1 @ 337.82
4 & 5	2' by 2' @ 341.17	340.00		2 @ 336.67	1 @ 338.87	
6 & 7	2' by 2' @ 340.60	340.00			2 @ 336.10 1 @336.80	
8	2' by 2' @ 340.60	340.20		1 @ 336.10	1 @ 337.10	
9	2' by 2' @ 341.75	340.00	3 @ 336.36	1 @ 337.90		
10	2' by 2' @ 340.86	340.20	3 @ 336.36	1 @ 337.90		
11	2' by 2' @ 341.68	341.20		2 @ 340.00		
12 & 13	2' by 2' @ 341.87	340.00		1 @ 337.37	1 @338.20	
14 & 15	2' by 2' @ 341.87	340.00			2 @ 337.37	1 @ 338.20
16 & 17	2' by 2' @ 341.37	340.00		2 @ 336.87	1 @ 338.00	
18 & 19	2' by 2' @ 340.66	340.00		3 @ 336.16	1 @ 338.80	
20 & 21	2' by 2' @ 341.13	340.00		2 @ 338.13	2 @ 336.13	
22 & 23	2' by 2' @ 342.15	340.00		3 @ 337.65 1 @ 338.65		
24 & 25	2' by 2' @ 340.74	340.00		2 @ 336.24		
26 & 27	2' by 2' @341.74	340.00		2 @ 337.24	1 @ 339.24	
28	3' by 3' @340.23	340.00		1 @336.50 1 @335.73		
29	3' by 3' @341.23	340.00	2 @336.73 2 @337.50			
30	3' by 3' @341.21	340.00	3 @336.73 3 @337.50			



Typical Outlet Control Structure Detail

N.T.S.





Typical Bio-Swale Detail Along Property Line

N.T.S.

quail vineyards

Stormwater Control Plan

DpC
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Sheet **7** of **7**

25268.2