CEQA ADDENDUM
to the
Final Initial Study/Mitigated Negative Declaration
for the
Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project
(State Clearinghouse No. 2016052009)

Prepared for:

Las Gallinas Valley Sanitary District

Administration Building, 300 Smith Ranch Road

San Rafael, CA 94903

Attn: Michael Cortez, PE, District Engineer

November 2019

wra
ENVIRONMENTAL CONSULTANTS

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LAS GALLINAS VALLEY SANITARY DISTRICT

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BACKGROUND

1. Project Title:	Addendum to the Final Initial Study/Mitigated Negative Declaration for the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project
2. Lead Agency and Project Applicant:	Las Gallinas Valley Sanitary District Administration Building, 300 Smith Ranch Road San Rafael, CA 94903
3. Contact Person and Phone Number:	Michael Cortez, PE, District Engineer (415) 526-1518
4. Project Location:	Las Gallinas Valley Sanitary District 300 Smith Ranch Road, San Rafael, CA 94903

The project site consists of a permanent construction laydown area located east of the Las Gallinas Valley Sanitary District (LGVSD, the District) wastewater treatment plant (WWTP) which is located at 300 Smith Ranch Road in San Rafael, California. The site or laydown area is situated adjacent to three medium-sized retention basins near the Las Gallinas Wildlife Ponds, a popular bird viewing area. The laydown area is located immediately south of the three retention ponds that are part of the ongoing operation of the WWTP (see Figures in Appendix A).

5. Introduction:

On June 9, 2016, the District Board of Directors via Board Resolution No. 2016-2073 adopted the Final Initial Study/Mitigated Negative Declaration (IS/MND) for the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project or Approved Project (Appendix B). The Approved Project is a treatment system upgrade and capacity expansion of the District's WWTP. The District currently provides secondary treatment of wastewater from mainly commercial and domestic sources within its service area. The Approved Project includes upgrades to the secondary treatment process and facilities at the WWTP, and includes replacement of the force main that heads southwest along the WWTP access road. The Approved Project will also expand the treatment capacity of the WWTP from 9 million gallons per day (MGD) to 18 MGD in order to handle peak wet weather daily flows. As part of the Approved Project, the Recycled Water Facility will be expanded to treat its designed capacity of 5.4 MGD and in turn, allow for the removal of the Marin Municipal Water District recycled water facility, which is located onsite. The building is located between the existing secondary bio-filter and the deep bed filters (see Figures in Appendix A). In summary, the Approved Project requires the removal of old structures, construction of new structures, and installation of piping between the structures. The main road to the WWTP will also be realigned and raised from the middle of the facility to the perimeter to account for potential issues from sea level rise and storm events.

On November 15, 2018, the District Board of Directors via Board Resolution No. 2018-2141 adopted the First Addendum to the Adopted Initial Study/Mitigated Negative Declaration for the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project (First Addendum). The First Addendum addressed the following changes to the Approved Project:

- Relocate the aeration and anoxic basins to the edge of the WWTP site from the center of the plant;
- Relocate the secondary clarifier #2 to the middle of the WWTP site from the edge of the plant;
- Remove modifications to the Administrative Building/Lab;
- Remove digester foam control modifications adjacent to the primary digester;
- Remove secondary clarifier #3;
- Remove the odor control unit;
- Remove the bioassay/restroom facility;
- Add 29,000 square feet of new asphalt/pavement and replace 56,000 square feet of existing asphalt/pavement;
- Add structures to house various treatment plant components including sludge thickener, deep bed filter corner, fuel tank, dechlor dosing facility, pond return meter vault, emergency standby generator, electrical building, utility transformer, and Recycled Water Treatment Facility (RWTF) distribution pump station;
- Add retaining wall along the easterly boundary;
- Reroute and add new gravel to the existing public access trail; and
- Minor modifications to the Equipment Building/Grit Removal/Headworks.

The First Addendum concluded that the revisions to the Approved Project site would not result in changes to the adopted IS/MND findings and no additional analysis was needed.

6. Statutory Background:

Under the California Environmental Quality Act (CEQA), an Addendum to a certified Environmental Impact Report (EIR) or Negative Declaration (ND) is appropriate if minor technical changes or modifications to the Approved Project occur (CEQA Guidelines 15164). An Addendum is appropriate only if these minor technical changes or modifications do not result in any new significant impacts or substantially increase the severity of previously identified significant impacts. The Addendum need not be circulated for public review (CEQA Guidelines

15164 [c]); however an addendum is to be considered by the decisionmaking body along with the previously-adopted environmental document prior to making a decision on the project (CEQA Guidelines 15164 [d]). This Addendum demonstrates that the environmental analysis and impacts identified in the prior Initial Study/Mitigated Negative Declaration (IS/MND) remain substantially unchanged by the circumstances described herein, and supports the finding that the Modified Project does not raise any new issues and does not exceed the level of impacts identified in the previously adopted IS/MND.

7. Applicable Reports in Circulation:

This Addendum is prepared as an addition to the Final Initial Study/Mitigated Negative Declaration (IS/MND) for the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project adopted by the District Board of Directors on June 9, 2016. A copy of said document is available for review at the offices of the Las Gallinas Valley Sanitary District, 300 Smith Ranch Road, San Rafael, CA 94903.

PROJECT DESCRIPTION

LGVSD's Modified Project consists of a new permanent laydown area to store HDPE pipe and other associated construction materials on top of wooden pallets as a part of constructing the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project. The permanent laydown area is situated south of the retention basins near the Las Gallinas Wildlife Ponds that are part of the ongoing operation of the WWTP (see Figures in Appendix A). The laydown area does not encroach onto the existing road south of the retention basins and would not obstruct public use or any other uses of the area. All applicable mitigation measures from the 2016 IS/MND are required to be implemented by the Modified Project, including Mitigation Measure BIO-2 (Nesting Bird Surveys and Avoidance).

The permanent laydown area was previously used as a temporary storage area during the ongoing construction of the upgrade project. The laydown area contains non-native vegetation (grasslands) in an upland area. Prior to use for temporary storage, non-native vegetation was removed from the laydown area which was also graded to facilitate the storage of HDPE pipe.

ENVIRONMENTAL ANALYSIS

The 2016 Approved Project IS/MND (State Clearinghouse No. 2016052009) was prepared by the District in accordance with the requirements of CEQA and the CEQA Guidelines. The 2016 IS/MND identified environmental impacts and recommended mitigation measures to address the impacts associated with the Approved Project. The IS/MND evaluated the standard comprehensive range of environmental topics listed in CEQA Guidelines, Appendix G. Through implementation of mitigation measures all of the identified potentially significant environmental impacts of the Approved Project would be mitigated to a less-than-significant level.

The Modified Project evaluated by this Addendum would modify the previously Approved Project to include a permanent laydown area south of the three retention ponds that are part of the ongoing operation of the WWTP. These changes to the previously Approved Project warrant detailed discussion for the following topics area: Biological Resources. The Modified Project would have no new significant impacts or a substantial increase in the severity of the prior-disclosed impacts with respect to all other environmental topics evaluated in the IS/MND because the Modified Project does not involve any substantial changes to the previously Approved Project.

Biological Resources:

The laydown area contains non-native vegetation (grasslands) in an upland area with no trees. Related to the use of the laydown area for temporary storage, a nesting bird survey (Appendix A) was performed in light of the 2016 IS/MND Mitigation Measure BIO-2 (Nesting Bird Surveys and Avoidance), and in response to an inquiry filed by the California Department of Fish and Wildlife Service, regarding compliance with Mitigation Measure BIO-2 for ensuring avoidance of sensitive biological resources. Mitigation Measure BIO-2, which is also required for the Modified Project, requires that a pre-construction nesting bird survey be performed by a qualified biologist no earlier than two weeks prior to the initiation of construction activities. If any active nests are found, a suitable buffer will be determined by the biologist and the nest will be flagged and avoided until the eggs have hatched and the chicks have fledged.

The District retained the services of qualified biologists to conduct a survey of nesting birds in active ongoing construction areas and adjacent buffers. Based on the inspection conducted on June 6, 2019, there is no evidence of any destruction of birds or nests/burrows within the footprint of active ongoing construction. Nesting barn swallows (*Hirundo rustica*) were observed on existing built structures within the treatment plant, specifically. The barn swallow nests were built when the plant activities were ongoing, and these nest locations are in no danger of being removed as part of plant upgrades. Hence, there is no indication of harassment or take of these barn swallow nests because of construction activity. No other active nesting birds were observed within the Project Area where active construction is ongoing or in adjacent buffer areas. Three small animal burrows were also observed at the proposed permanent laydown area. While these burrows may be suitable nesting sites for wintering burrowing owls (*Athene cunicularia*), no evidence of nest disturbance or take of burrowing owls was observed.

The District's required compliance with applicable mitigation measures from the 2016 IS/MND, particularly Mitigation Measure BIO-2, will ensure that the Modified Project does not result in any new significant impacts related to biological resources or a substantial increase in the severity of the prior-disclosed impacts related to biological resources.

Mandatory Findings of Significance:

The potential impacts of the Modified Project with regard to biological resources would be comparable to the Approved Project. As impacts under the Modified Project would be similar to relative to the Approved Project, impacts would be less than significant.

SUMMARY AND FINDINGS

Review of the Modified Project has concluded that there will be no new impacts beyond those analyzed in the Final Initial Study/Mitigated Negative Declaration for the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project adopted by the District Board of Directors on June 9, 2016. None of the conditions described in Section 15162 of the CEQA Guidelines calling for preparation of a Mitigated Negative Declaration have occurred, and thus an Addendum to the Final Initial Study/Mitigated Negative Declaration for the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project is appropriate to satisfy CEQA requirements for the Modified Project. The following findings are therefore provided in accordance with CEQA Guidelines Section 15164(e) concerning the decision not to prepare a subsequent Negative Declaration pursuant to CEQA Guidelines Section 15162.

(1) None of the following conditions calling for preparation of a subsequent Negative Declaration have occurred:

> (a) Substantial changes are proposed in the project which will require major revisions of the previous Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in severity of previously identified significant effects;
>
> (b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions of the previous Negative Declaration due to involvement of new significant environmental effects or a substantial increase in severity of previously identified significant effects; or
>
> (c) New information of substantial importance which was not known could not have been known with the exercise of reasonable diligence at the time the previous Negative Declaration was adopted, shows the following:
>
>> (i) The project will have one or more significant effects not discussed in the previous Negative Declaration;
>>
>> (ii) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
>>
>> (iii) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
>>
>> (iv) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

(2) Only minor technical changes or additions are necessary to make the Mitigated Negative Declaration consideration adequate under CEQA.

(3) The changes to the Mitigated Negative Declaration made by this Addendum do not raise important new issues about the significant effects on the environment.

This Addendum finds that actions under the Modified Project; as identified herein, will not result in any new significant environmental effects or result in the substantial increase of any previously identified impacts in the previous Mitigated Negative Declaration.

Signature: ______________________________ Date: 12/12/19

Name and Title: Michael Cortez, PE, District Engineer

Appendix A

Nesting Bird Survey Results for the Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project, San Rafael, California (June 7, 2019)

June 7, 2019

Michael P. Cortez, PE
300 Smith Ranch Road
San Rafael, CA 94903

Re: Nesting bird survey results for the Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project, San Rafael, California

Dear Mr. Cortez:

This letter reports the findings of a survey for nesting birds conducted by WRA on June 6, 2019, at the location of ongoing construction related to the above-referenced plant upgrade project. The survey was performed in light of the project's ISMND Mitigation Measure BIO-2 (Nesting Bird Surveys and Avoidance), and in response to an inquiry filed by the California Department of Fish and Wildlife Service, regarding compliance with the aforementioned ISMND measure for ensuring avoidance of sensitive biological resources. Project activities (tree and vegetation removal, building demolition) have some potential to adversely impact nesting birds with baseline legal protections under the federal Migratory Bird Treaty Act and California Fish and Game Code. Specifically, nesting birds may occur in vegetation (grasslands, trees, and shrubbery) and on buildings within or adjacent to the Project Area. The Mitigation Measure BIO-2 requires that a pre-construction nesting bird survey be performed by a qualified biologist no earlier than two weeks prior to the initiation of construction activities. If any active nests are found, a suitable buffer will be determined by the biologist and the nest will be flagged and avoided until the eggs have hatched and the chicks have fledged.

Pre-construction nesting surveys were completed for trees that were removed in November 2018 and January 2019. No active nests were observed in the trees prior to their removal. However, the pre-construction nesting surveys only covered the trees that were removed, and other portions of the Project Area were not surveyed prior to work being initiated in May 2019.

Las Gallinas Valley Sanitary District retained the services of WRA on June 5, 2019, to conduct a survey of nesting birds in active ongoing construction areas and adjacent buffers. On June 6, 2019, WRA qualified Biologist Nathaniel Clark inspected areas of ongoing construction related to the plant upgrade project for nesting birds, and evidence of any destruction of birds or nests/burrows. The survey conducted by Mr. Clark was overseen by Senior Biologist Jason Yakich. Resumes for Mr. Clark and Mr. Yakich are enclosed.

Based on the inspection, there is no evidence of any destruction of birds or nests/burrows within the footprint of active ongoing construction. Nesting barn swallows (*Hirundo rustica*) were observed within the Project Area; these nests are located on existing built structures within the treatment plant, specifically. The barn swallow nests were built when the plant activities were ongoing, and these nest locations are in no danger of being removed as part of plant upgrades. Hence, there is no indication of harassment or take of these barn swallow nests because of construction activity. No other active nesting birds were observed within the Project Area where active construction is ongoing or in adjacent buffer areas. Three small animal burrows were also observed in an area located east of the plant upgrade project that is being used temporarily to store piping. While these burrows may be suitable nesting sites for wintering burrowing owls (*Athene cunicularia*), no evidence of nest disturbance or take of burrowing owls was observed.

Project Area Description

Vegetation removal related to plant upgrade activities, including removal of trees, occurred in November 2018, and in January 2019. Initiation of plant upgrade construction activities occurred in February 2019. The locations of active ongoing construction activities are shown in the enclosed maps and drawings. Ongoing construction activities related to the plant upgrade are located within existing disturbed areas of the existing wastewater treatment plant and a small temporary laydown area located east of the plant and adjacent to three medium-sized retention basins near the Las Gallinas Wildlife Ponds, a popular bird viewing area. The laydown area is located immediately south of the three retention ponds that are part of the ongoing operation of the wastewater treatment plant. The temporary laydown area was used to temporarily store wooden pallets beginning in mid-April 2019, and then subsequently graded in late May 2019 in order to temporarily store HDPE pipe for the plant upgrade project.

Methods

On June 6, 2019, the Project Area was traversed on foot by WRA Biologist Nathaniel Clark to survey for nesting birds. The survey was conducted between 7:15 AM and 10:00 AM, and covered the areas of active ongoing construction, a temporary laydown area located east of the plant upgrade project, and adjacent buffer areas that were accessible. The surveyed area was investigated for any evidence of avian territorial behavior (e.g., singing, chasing intruders out of territories, etc.), nesting bird behavior (e.g., adult birds carrying nesting material or food), or the presence of active nests and/or pre-fledged juvenile birds. Observations were made with binoculars and the naked eye. Careful attention was paid to the structures most favorable for nesting, including trees and shrubbery with relatively thick foliage, and the eaves of buildings.

Results

Active barn swallow nests and nesting behavior were observed within the Project Area during the survey. The barn swallow nests are located under the eaves of a large recycled water storage tank that is not part of the plant upgrade project, located immediately south of the proposed Secondary Clarifier #1, shown in the enclosed *Figure 4 – Addendum No. 1 Site Plan*. The barn swallow nests were likely built when plant activities were ongoing, and the nesting birds are therefore acclimated to noise and vibration disturbances. This building is not in danger of being removed or disturbed during construction activities. These nests are habituated to the treatment plant's disturbance levels and are unlikely to be affected by the ongoing construction.

Three small animal burrows were observed immediately north of the temporary laydown area located south of the three retention ponds adjacent to the Las Gallinas Wildlife Ponds. The three burrows were observed in intact grassland vegetation on a berm slope facing southward. While grading to prepare the temporary laydown area occurred within approximately ten feet of the burrows, the burrows were intact and undisturbed by the grading. These burrows may be suitable for use by wintering burrowing owls, however, no indicators of active owl nesting were observed at the time the survey was conducted. Dense overhanging emergent vegetation, accumulated duff and debris, and intact insect webbing were all observed at the entrances of these burrows. Furthermore, the temporary laydown area was created after wintering burrowing owls typically vacate nest locations in late Spring. These findings indicate that the burrows were unoccupied at the time the temporary laydown area was created, and no burrowing owls were adversely affected by the project construction activities.

Recommendations

WRA recommends further nest surveys for burrowing owl within the Project Area and adjacent buffer areas to ensure no adverse effects occur during ongoing active construction. WRA also recommends removal and relocation of the temporary laydown area to a more suitable location away from the Gallinas Wildlife Ponds, as this area is generally known to provide suitable habitat for many bird species, including burrowing owls.

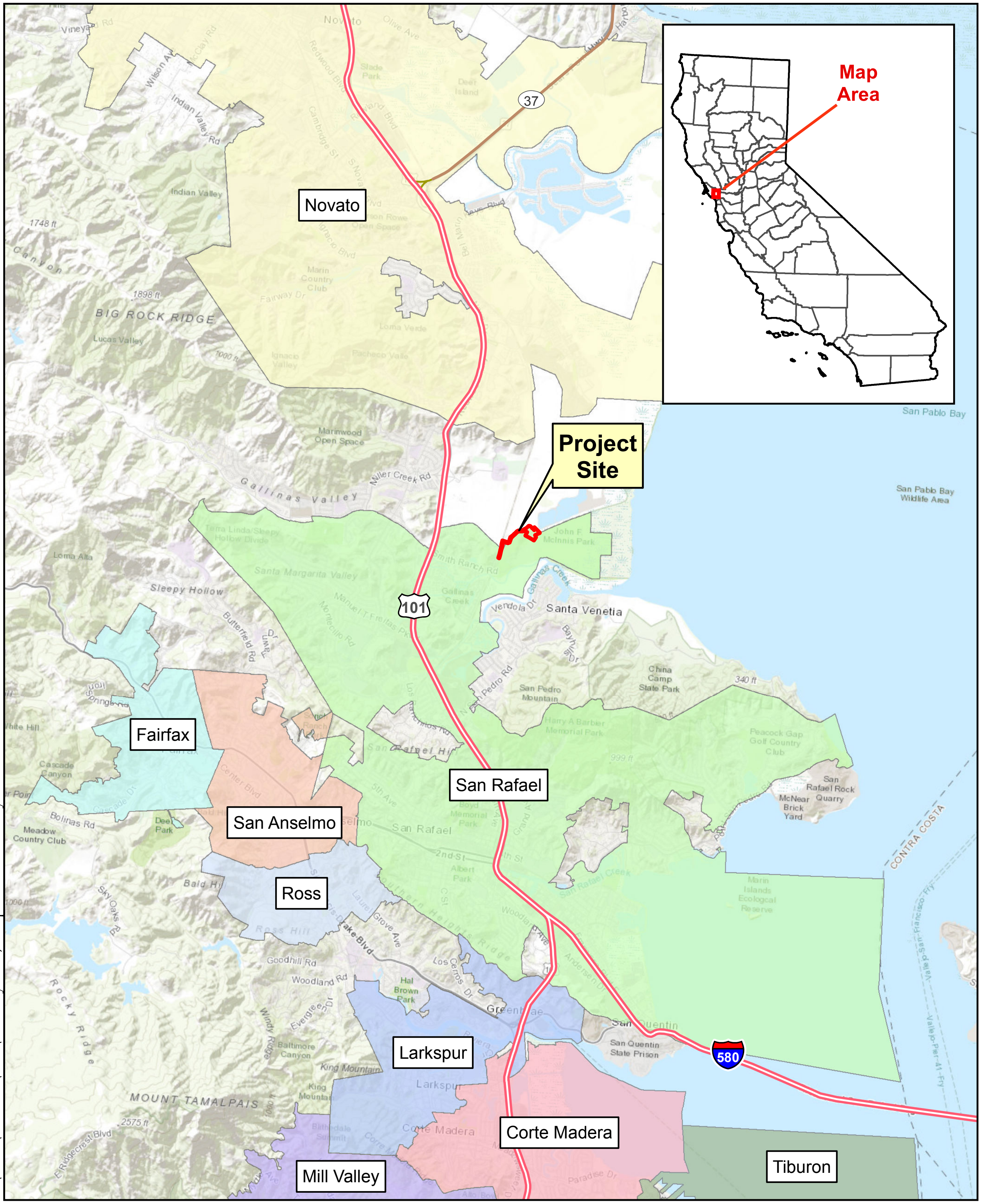
Based on WRA's inspection and coordination with Las Gallinas Valley Sanitary District representatives, no active bird nests or birds within the Project Area have been adversely affected by the ongoing construction activities.

Please contact me with any questions.

Sincerely,

Mark Kalnins
Senior Associate Regulatory Permitting Specialist
kalnins@wra-ca.com

Enclosures Qualified Biologist Resumes
Site Maps and Drawings Showing Ongoing Construction Areas



G:\2015\15-0154\GIS\Vicinity.mxd; Map created 30 May 2018

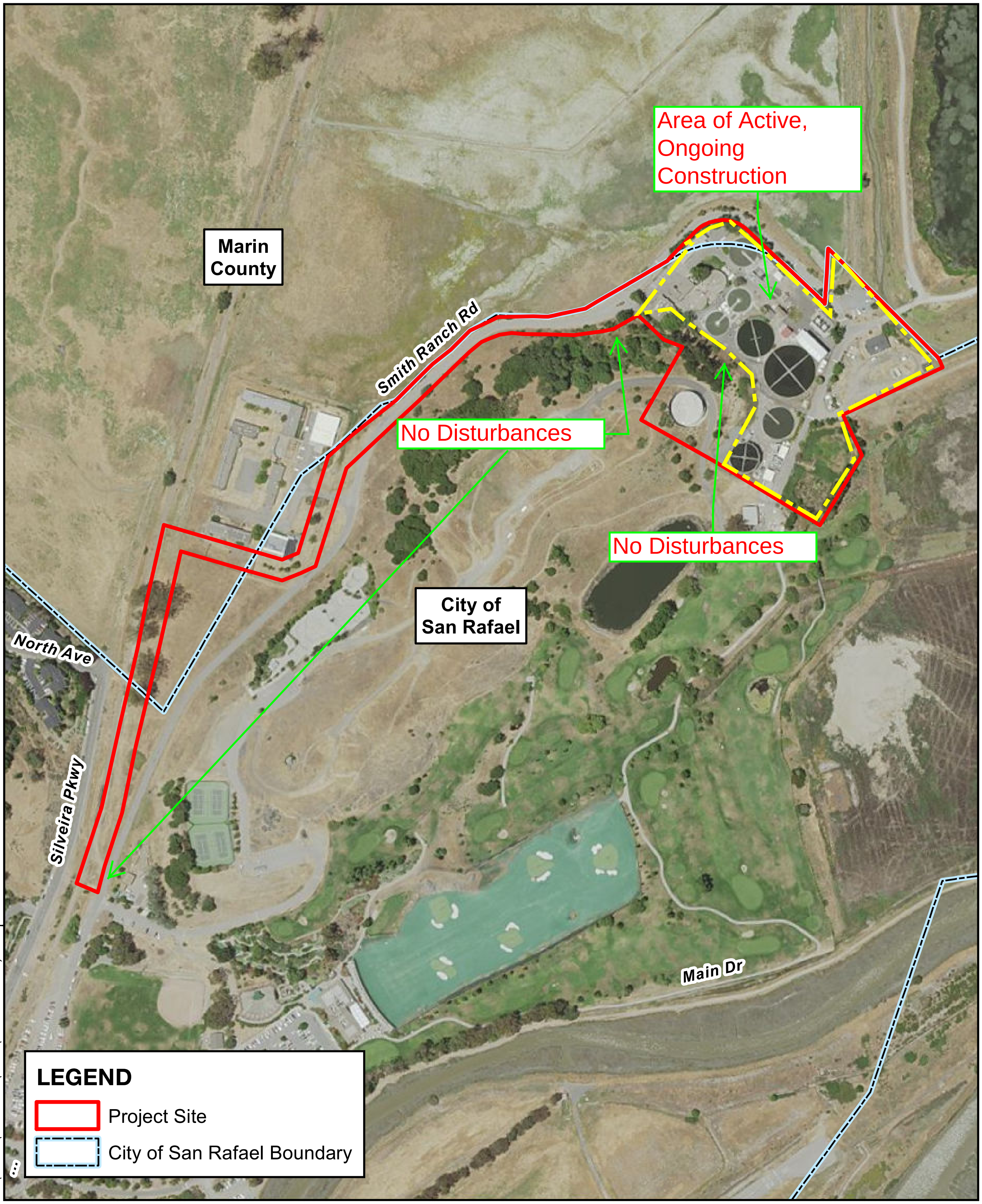
Sources: Marin Co. GIS, 2015; ESRI/USGS

Figure 1 - Vicinity Map

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

0 1 2 3 Miles

ALBERT A. WEBB ASSOCIATES



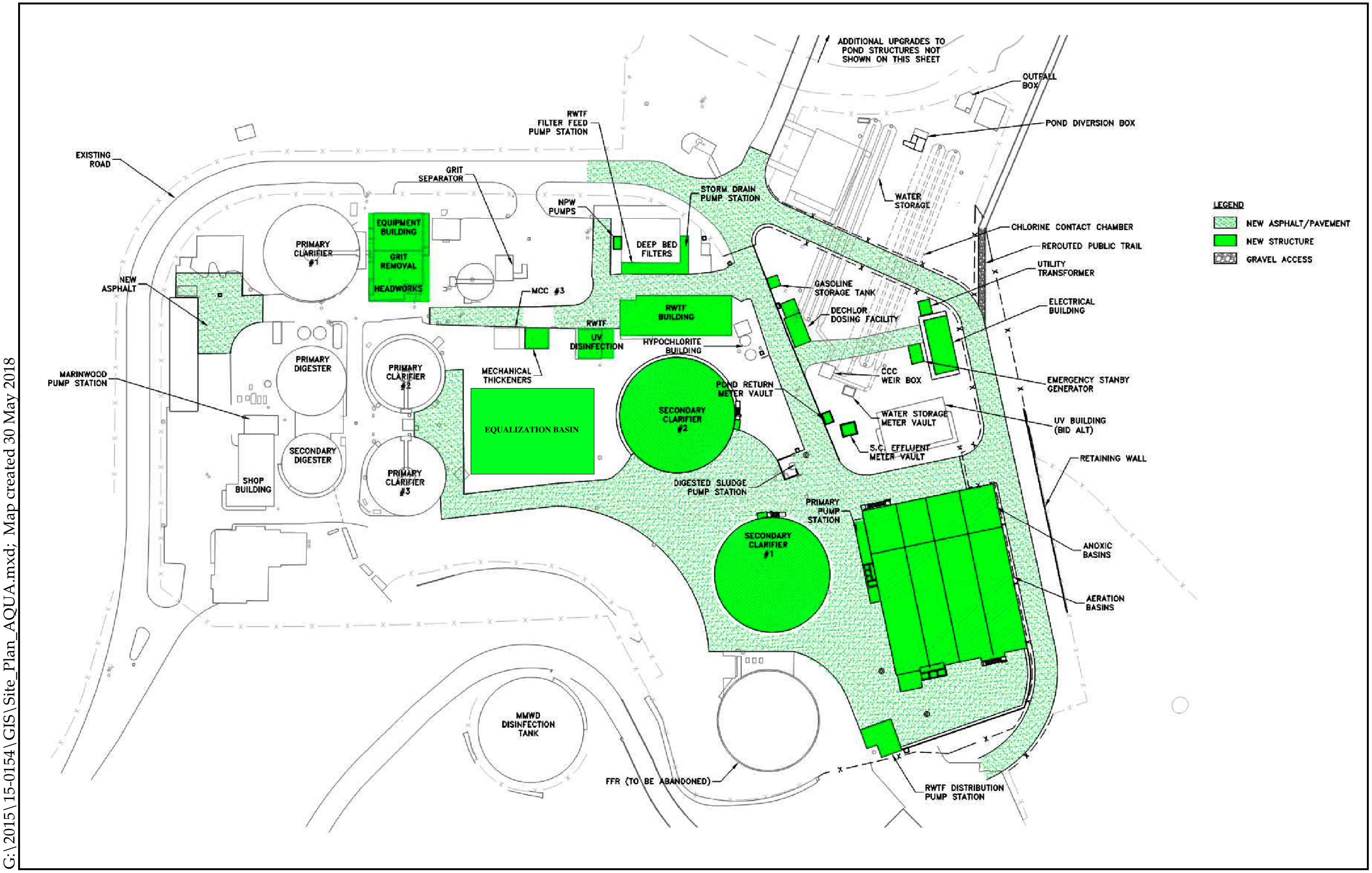
G:\2015\15-0154\GIS\Aerial.mxd; Map created 17 Mar 2016

Sources: Marin Co. GIS, 2015;
USDA NAIP imagery, 2014.

Figure 2 - Project Site

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

ALBERT A. WEBB ASSOCIATES



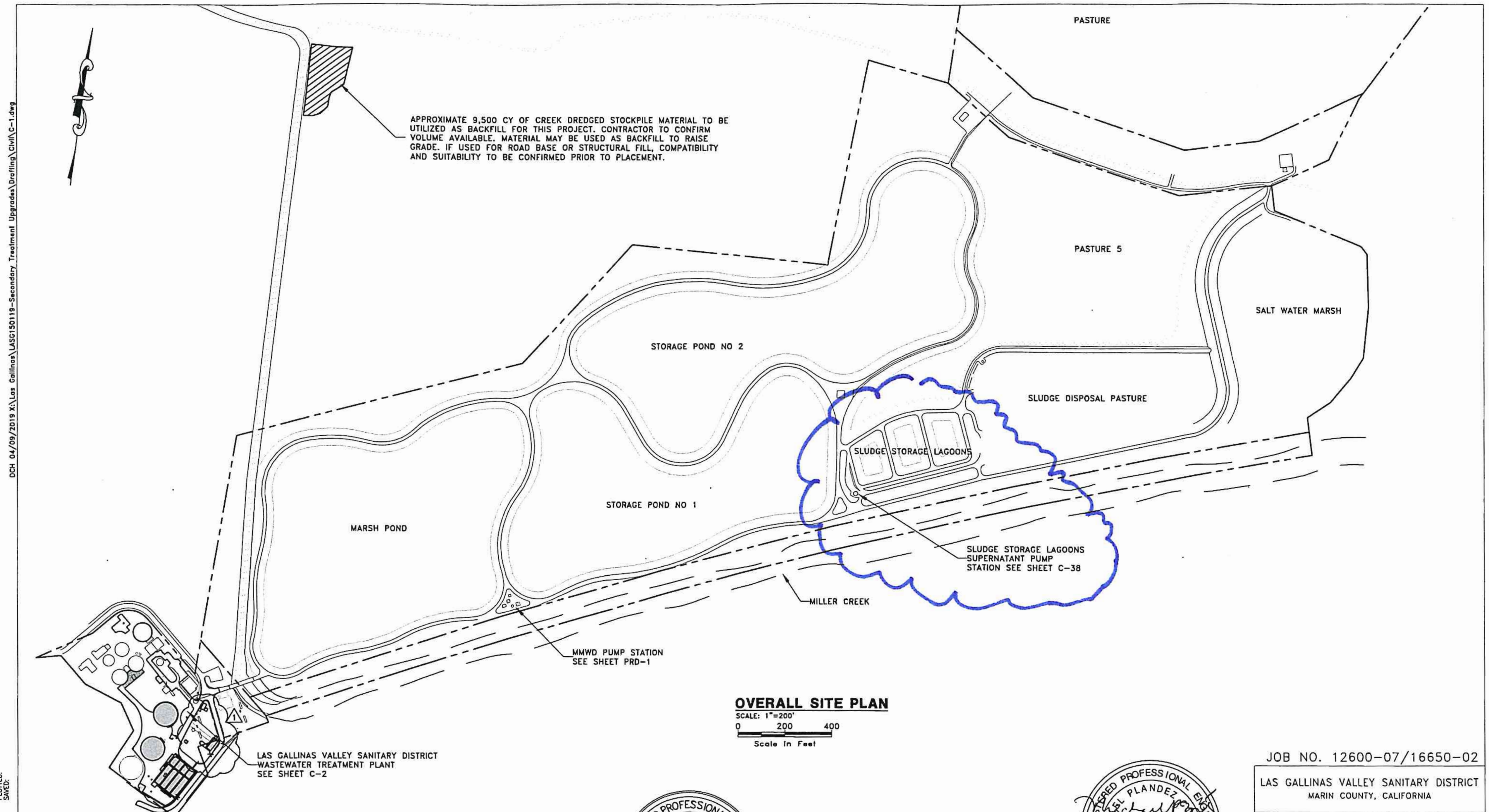
G:\2015\15-0154\GIS\Site_Plan_AQUA.mxd; Map created 30 May 2018

Source: Aqua Engineering, April 2018.

Figure 4 - Addendum No. 1 Site Plan

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

ALBERT A. WEBB ASSOCIATES



OVERALL SITE PLAN

SCALE: 1"=200'

0 200 400

Scale In Feet

JOB NO. 12600-07/16650-02

REGISTERED PROFESSIONAL ENGINEER JUSTIN R. LOGAN C 73749 11/15/18 CIVIL STATE OF CALIFORNIA

AQUA ENGINEERING

533 W. 2600 S. SUITE 275, BOUNTIFUL, UT 84010
PHONE (801) 299-1327 FAX (801) 299-0153

REGISTERED PROFESSIONAL ENGINEER MICHAEL PLANDEZ CORTEZ No. C54039 Exp. 12/31/2019 CIVIL STATE OF CALIFORNIA

LAS GALLINAS VALLEY SANITARY DISTRICT
MARIN COUNTY, CALIFORNIA

SECONDARY TREATMENT PLANT AND RW EXPANSION

CIVIL
OVERALL SITE PLAN

NO.	DATE	DESCRIPTION	BY	APP'D
1	4/1/19	REMOVE UV BID ALTERNATE	DCH	JRL

REVISIONS

WBS 120

CHECKED	DRAWN	SCALE
JRL	DCH	AS SHOWN
APPROVED	DESIGNED	DATE
JRL	EES	11/15/18

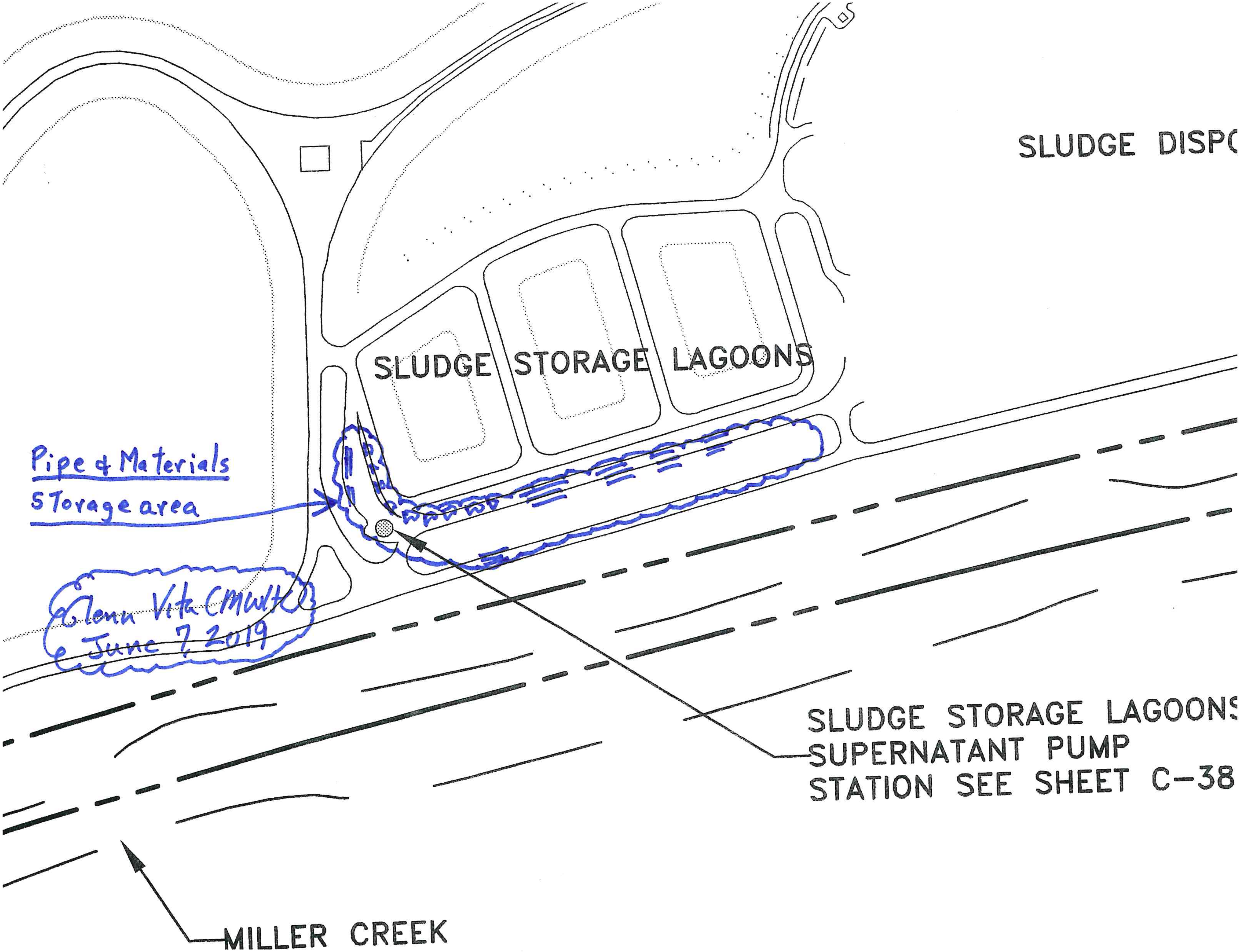
GENERAL MANAGER: Chris DeGabriele
DISTRICT ENGINEER: Michael P Cortez, RCE # 54039

SHEET: 51 of 327 | PLAN NO.: | DRAWING NO.: C-1 | REVISION NO.: C

PLOTTED:
SAVED:

LGVSD 1 FILE:
FD144793

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4


SLUDGE DISPO
SLUDGE STORAGE LAGOONS
Pipe & Materials
Storage area
Glenn Vita CMWH
June 7, 2019
SLUDGE STORAGE LAGOONS
SUPERNATANT PUMP
STATION SEE SHEET C-38
MILLER CREEK

NATHANIEL CLARK
Biologist
clark@wra-ca.com
o: 415.454.8868 x1280
c: 415.857.3298

Years of Experience: 4

Education

MS, Environmental Management, University of San Francisco, 2017

BS, Environment Science, University of California, Los Angeles, 2014

Professional Affiliations/ Certifications

Qualified Applicator Certificate (#137294)

Specialized Training

Basic Wetland Delineation Course, University of San Francisco, 2016

National Outdoor Leadership School, Alaska, 2009

Nathaniel Clark received his Bachelor's degree in Environmental Science and his Master's degree in Environmental Management. He has worked in the management and treatment of invasive plant species in a variety of vegetation communities, including grasslands, serpentine communities, oak and bay woodlands, tidal marshes, vernal pools, and dune habitats. Nathaniel also has experience in monitoring for nesting birds, western pond turtles, and steelhead redds, as well as marine mammal monitoring and identification.

Representative Projects

Pier 70 Redevelopment, South San Francisco, California

The Pier 70 redevelopment project lies on the San Francisco waterfront. A 28-acre portion of the Pier 70 Project is planned for demolition and surveys are required in the spring and summer of 2018, prior to build-out of the Project. Currently, the site is developed with numerous buildings which are scheduled for demolition so that reconstruction of the site can occur. Nathaniel assisted with required surveys for both nesting birds and bat roosts throughout the site. Overall surveys covered approximately 12 buildings of various construction, and stages of decay, as well as adjacent undeveloped habitats. This project is ongoing.

City of Livermore Stream Maintenance Mitigation, Livermore, California (August 2017 - January 2018)

Nathaniel conducted over 300 hours of onsite construction monitoring for California red-legged frog and California tiger salamander during the maintenance and restoration of pedestrian trails in and near riparian zones. He conducted pre-construction surveys prior to daily work, as well as monitoring during heavy-equipment operation, coffer-dam installation, and hydroseeding.

City of Oakley Bethel Island Road Culvert Project, Oakley, California (July – October 2017)

Nathaniel produced a complete permit package for the repair of a culvert on Bethel Island Road in Oakley. The permit package included a US Army Corps of Engineers Nationwide Permit Pre-Construction Notice, a California Department of Fish and Wildlife Lake and Streambed Agreement 1600 Notification, and a Regional Water Quality Control Board 401 Certification Application, as well as associated supplemental information.

The Village at Loch Lomond Marina, San Rafael, California (August – December 2017)

Nathaniel conducted annual vegetation and hydrological monitoring to evaluate the success of the mitigation wetlands. He then produced the annual report which included an analysis of the data collected for the year on hydrology, soils, and vegetation, a comparison to the prescribed success criteria, and recommendations for management actions in future years.

Internships and Volunteer Work

Marin County Parks and Open Space, Marin County, California (January – May 2017)
As a biological monitor, Nathaniel conducted nesting bird surveys for construction and mowing sites; biologic assessment surveys for sensitive species along proposed trail construction sites; and monitored for wildlife during mechanical excavation at construction sites; and surveyed for salmonoids and redds. He mapped spatial wildlife data using ArcGIS and produced potential to occur tables for sensitive species in proposed construction areas. Nathaniel was also responsible for maintaining wildlife camera traps and catalogue subsequent photos for the Marin Wildlife Picture Index.

The Marine Mammal Center, Sausalito, California (September 2014 – January 2015)
Nathaniel served as a stranding intern. He participated in a number of animal husbandry tasks, including restraining, feeding, and medical procedures. He operated stranded animal hotline, organized response efforts, and conducted rescue operations. Nathaniel expanded animal records in both paper and digital formats via medical charts and electronic database and also maintained and repaired animal gear and equipment, including nets, herding boards, carriers, and vehicles.

***Heal the Bay (Santa Monica Branch), Santa Monica, California* (January – June 2014)**
Nathaniel served as a team statistician, measuring water quality effects on benthic macroinvertebrate assemblages. He also organized, cleaned, and correlated large taxonomical, physical, and chemical datasets.

National Park Service, Hawaiian Island Hawksbill Turtle Recovery Project, Hawaii (June – September 2013)
Nathaniel served as a Turtle Crew Volunteer. He restrained, tagged, and released nesting Hawksbill turtle females; captured, counted, and assisted hatchlings on their way to the ocean; and labeled nests during egg laying, and set up nest cages to protect nests from invasive predators

JASON YAKICH

Senior Wildlife Biologist

yakich@wra-ca.com

o: 415.454.8868 x1240

c: 415.202.3166

Years of Experience: 15

Education

MS, Biology (Marine Biology),
San Francisco State University

BA, Biology,
University of California, Santa Cruz

Professional Affiliations/ Certifications

USFWS 10(a)1(A) Recovery Permit
TE-58760A-0

- California Ridgway's (clapper) rail (active surveys)
- California tiger salamander (larval surveys)
- vernal pool branchiopods

California Department of Fish and Wildlife Scientific Collecting Permit MOUs

- California black rail (active surveys)
- California tiger salamander (larval surveys)

Western Field Ornithologists

Western Chapter of the Wildlife Society

Specialized Training

Airport Wildlife Hazard Management Workshop, Embry-Riddle Aeronautical University (2011)

Fairy Shrimp of California Identification Course (2010)

Jason Yakich received an MS in Biology (marine biology focus) from San Francisco State University, and a BA in Biology from UC Santa Cruz. He has over 15 years of experience as a wildlife biologist with a particular focus in avian biology.

At WRA, Jason is responsible for managing and participating in and diverse field activities including site assessments, surveys and habitat assessments for special-status species, nesting bird surveys, and biological monitoring. He prepares and oversees many types of work products and technical reports, and assures permit compliance for a wide array of public and private projects that range from construction of single-family residences to broad-scale development and mitigation projects. Jason has permit authorizations from the U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife to conduct active (call-playback) surveys for California Ridgway's (formerly clapper) rail (CRR) and California black rail (CBR), larval surveys for California tiger salamander, and surveys for listed vernal pool branchiopods (fairy shrimps, tadpole shrimp).

Representative Projects

Sherman Island Whale's Mouth Wetland Restoration Project, Sacramento County, California

As part of continued collaboration with Ducks Unlimited, Inc. and the California Department of Water Resources (DWR), WRA provided biological services during the construction phase of a large-scale habitat restoration project on Sherman Island, located in the western Delta near the confluence of the Sacramento and San Joaquin Rivers. The project will ultimately restore approximately 600 acres of palustrine wetlands on lands owned by DWR which were previously managed as flood-irrigated pastures. During 2015 Jason managed a nesting bird survey effort across the restoration site prior to and during ground disturbance, which involved close coordination with Ducks Unlimited and the construction contractors. A variety of bird nests were found throughout the work area, and protected from disturbance during construction. Jason also handed reporting duties related to these surveys.

Elsie Gridley Mitigation Bank, Solano County, California

The Elsie Gridley Mitigation Bank is the largest mitigation bank in California at more than 1,800 acres, and is a central component of the largest contiguous vernal pool preserve in the United States. The bank is approved by five different agencies and covers two different Army Corps Districts. In addition, the bank sells both numerous species credits such as California tiger salamander, vernal pool crustaceans, Swainson's hawk, and burrowing owl, as well as wetland credits to offset impacts under the Clean Water Act. As part of the ongoing annual monitoring requirement Jason has co-led the monitoring efforts for CTS and vernal pool branchiopods. During 2013 and 2014 surveys over 2,500 CTS larvae were captured, enumerated and measured, and monitoring will continue in subsequent years. Jason also oversees annual monitoring for burrowing owl and Swainson's hawk.

Redwood City Saltworks Biological Baseline Study, Redwood City, California
Jason led a broad, ongoing avian survey effort at a salt production facility in South San Francisco Bay from 2009 to 2012. The purpose of the survey effort is to document existing conditions in wildlife utilization. The survey effort has included: 1) waterbird surveys focused on species identification, enumeration, and activity; 2) breeding bird surveys in tidal marsh habitats using point-count methodology; 3) a habitat assessment for western snowy plover; 4) a habitat assessment for California clapper rail; and, 5) general documentation of use of the site by other wildlife, including special-status and non-special-status species. Jason is responsible for the waterbird and tidal marsh breeding bird survey designs, and has participated in all aspects of field work at the site to date, as well as the analysis of all survey data and contributions to biological resource documents.

Cojo-Jalama Ranches Long-Term Biological Studies, Santa Barbara County, California
WRA worked with a confidential client to document biological resources within a collection of historic cattle ranches comprising nearly 25,000 acres on the Santa Barbara coastline. Collectively known as the Cojo-Jalama Ranches, the site sits at Point Conception, the confluence of northern and southern California. The site's long history of cattle ranching extending to the Spanish era, combined with its ecological uniqueness, gives it an important place in California's cultural and environmental legacy. WRA worked to document biological resources at the site for several years beginning in 2012. During this time, Jason led and participated in several wildlife-related survey efforts at the site, including surveys for marine mammals, western snowy plover (both nesting and wintering), special-status riparian birds, nesting raptors, and special-status wildlife species in general.

Warm Springs Fish and Wildlife Refuge, Fremont, California
Between 1998 and 2011, WRA worked on the Pacific Commons Preserve, a 444-acre site containing vernal pools and other habitat features constructed as mitigation for the nearby Pacific Commons development project. The site was eventually incorporated into the adjacent Warm Springs Seasonal Wetland Unit of the Don Edwards U.S. Fish and Wildlife Service Refuge. The site contains federal endangered vernal pool tadpole shrimp and Contra Costa goldfields, as well as federal threated California tiger salamander and other special status species. This project has been regarded as a success, creating a functional mosaic of wetland habitat supporting robust populations of protected species in an urban area. Jason participated in several aspects of this project from 2007 to 2011, including annual field surveys for California tiger salamander, burrowing owl and vernal pool crustaceans, hydrological monitoring, and analyses of site data. Jason has also prepared annual wildlife monitoring reports for the regulatory agencies, and presented the results of several years of wildlife monitoring at the 2009 Western Chapter of the Wildlife Society annual meeting. In 2012, Jason worked with the U.S. Fish & Wildlife Service to co-author a long-term Biological Monitoring Plan based on WRA's extensive experience with the site.

Young Ranch Butterfly and Burrowing Owl Surveys, Santa Clara County, California
Young Ranch is an approximately 2,100 acre ranch in the Coyote Hills just southeast of San Jose, California. WRA is managing a biological resources assessment of the property, including a butterfly-specific habitat suitability analysis for the federally endangered Bay checkerspot butterfly (BCB), as well as annual surveys for both BCB and burrowing owl. Jason's chief involvement in this project has been to lead and participate in adult BCB and burrowing owl surveys in an effort to document on-site habitat use and provide information for the development of a land use plan. During surveys, he has identified many individual BCBs, trained other field surveyors, and provided GPS locations which are being used in the plan.

Soquel Canyon Stream Mitigation and Wildlife Conservation Bank, Chino Hills, California
Soquel Canyon is a 300+ acre property that is proposed as a stream mitigation and wildlife conservation bank to serve Los Angeles, Orange and western San Bernardino counties. Jason has conducted field surveys and habitat assessments for special status species on the property, and co-authored the proposed bank's Biological Resources Inventory. The bank is expected to be approved for credit sales in late 2012.

Exploratorium Relocation Project, San Francisco, California
The Exploratorium is a children's science education institution located in San Francisco, California, and relocated its existing museum to Piers 15 and 17 along The Embarcadero. The relocation involved repair, replacement, and expansion of the existing piers, including pier support piles and decking. Jason conducted biological monitoring for marine mammals and Pacific herring spawning during pile driving activities as required by NMFS and CDFG, and authored a monitoring summary report that was submitted to NMFS. Jason also obtained and led the implementation of a Wildlife Depredation Permit from the U.S. Fish and Wildlife Service. This permit allowed for the limited management of western gulls nesting within active work areas to reduce health and safety hazards to workers. The project was completed successfully.

Marin County Open Space District, Road and Trail Management Plan, Marin County, California
As a member of a team, WRA is working to assist the Marin County Open Space District in preparing a Road and Trail Management Plan and associated programmatic CEQA document. This work will allow the District to more efficiently utilize limited funds for road and trail management and to prioritize sensitive habitats for protection. For this project, Jason provided technical support in analyzing which sensitive wildlife species had the potential to occur within the diverse lands and habitats managed by the District.

Stoneridge Drive Bridge Construction Project, Pleasanton, California
Development plans adjacent to Arroyo Mocho, a perennial creek/drainage, involve the construction of a bridge over this feature required protocol-level surveys for California Red-legged Frog and a concurrent effort for Western Pond Turtle. Jason led the field survey and habitat assessment effort for this project, and also prepared a final report detailing the findings of the surveys. The results of the surveys were accepted by city planners. For a latter phase of the project, Jason was contracted to conduct pre-construction surveys for breeding birds and special-status wildlife, as well as oversee worker biological sensitivity training and other aspects of permit compliance. Bridge construction was completed successfully in 2013.

IR Site 17/Building 503 Biological Monitoring, Mare Island, California
Jason developed measures to protect salt marsh harvest mouse during remedial investigation activities at IR Site 17 and the Building 503 at Mare Island. Jason led the sensitive species contractor awareness program and monitored investigation activities during implementation. The investigation was completed successfully and was in compliance with all species protection measures.

Allied Defense Recycling Mare Island Dry Dock Fish Salvage, Vallejo, California
Mothballed vessels from the National Defense Reserve Fleet in Suisun Bay are brought to the dry docks at the former Mare Island Naval Shipyard to be recycled under contract by Allied Defense Recycling. Before work can begin, the 660-foot-long dry dock is flooded with approximately 12 million gallons of water, a ship is then towed in, and the dry dock is then dewatered. In accordance with permit requirements of U.S. Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Game, biologists are required to be present during final stages of dewatering to salvage stranded fish from the dry dock. Fish salvage involves use of seines, block nets, and dip nets to systematically capture fish. They are then placed in aerated holding coolers, identified to species, counted and measured before being placed in the Mare Island Channel of the Napa River. Jason provides field technical support for the salvages, including participation in fish capture, identification and processing, and documentation. This is the first time the Mare Island Dry Docks have been operated by a private company, and the recycling effort will help eliminate several tons of lead based paint and heavy metals from entering San Francisco Bay.

Zanker Road Wetland Restoration, San Jose, California
Jason participated in the tidal channel creation and wetland restoration of approximately 12 acres of habitat in Santa Clara County. Working as a U.S. Fish and Wildlife Service approved biologist for Salt Marsh Harvest Mouse (SMHM), Jason monitored vegetation removal, exclusion fence installation, soil excavation, and soil placement. His responsibilities included daily preconstruction checks for SMHM, construction monitoring, and on-site permit compliance. All phases of ground disturbance and tidal restoration were completed in fall of 2011.

Petersen Ranch Mitigation Bank, Leona Valley, California
The Petersen Ranch Mitigation Bank is a proposed 4,000 acre mitigation bank in Los Angeles County and will be the largest mitigation bank in California. The bank consists of two different sites located in the Santa Clara River and Antelope Valley watersheds. Jason aided in initial wildlife surveys and documented a nesting colony of tricolored blackbirds on the property and Pacific pond turtle. As part of the bank proposal process, Jason also aided in writing the Biological Resources Inventory for the property. The Bank was been approved to sell credits in 2015.

MOTCO California Black Rail Surveys, Concord, California
Jason conducted population-level surveys for state-listed California black rail on a property containing tidal and brackish marsh habitats along the Suisun Bay shoreline, including the use of active (i.e., call-playback) techniques. The surveys were initiated for site planning purposes and the results were detailed in a report presented to the client.

California Least Tern Nesting Colony Monitoring and Habitat Management, Pittsburg, California
Jason participated in annual monitoring and habitat management of a four-acre California least tern nesting site located in the cooling canal complex at the Pittsburg Power Plant in Contra Costa County from 2008 to 2016. Jason supervised weekly visits to monitor adult breeding pairs, nests, and fledglings, as well as predation, competition, and management needs; all data was submitted to the USFWS and CDFW annually.

Refinery Marine Terminal Wildlife Surveys and Monitoring, Martinez, California
Jason has performed biological monitoring for several phases of a well installation project at a refinery marine terminal on Suisun Bay. The primary special-status species of concern for the project are the federal endangered California Clapper Rail and Salt-marsh Harvest Mouse. Jason has also participated in protocol level rail surveys resulting in positive detections of both California Clapper Rail and California Black Rail.

The Ranch on Silver Creek, San Jose, California
WRA biologists conducted ten years of plant and wildlife monitoring studies on the 450-acre Silver Creek Preserve in South San Jose as part of a habitat restoration effort undertaken as mitigation for a William Lyon Homes, Inc. golf and housing development. Preserve lands now support expanding populations of three listed species, including the Bay checkerspot butterfly. Jason conducted line-transect surveys for Bay checkerspot, which require expertise in identification of both the butterfly and its host plants. The survey results were incorporated into annual monitoring reports that document the success of the restoration project and its effects on the local Bay checkerspot population.

Cakebread Cellars Arroyo Creek Winery, Napa, California
Arroyo Creek winery is located in the hills southeast of Napa, California. The site is primarily composed of mixed Oak woodland and non-native grassland. Jason participated in pre-construction roost emergence surveys using night vision equipment and ultrasonic acoustic surveys, using Pettersson D240x detectors for tree roosting bats prior to the conversion of non-native grassland to vineyards. Several bat roosts were detected and four species of bats were identified. Through use of buffers and avoidance techniques, no active roosts were disturbed during the construction process.

NCRA Breeding Bird Surveys, Napa and Sonoma Counties, California
In accordance with the measures described in the ADEIR for the North Coast Railroad Authority (NCRA) Russian River Division Freight Rail Project, Jason participated in breeding bird surveys along 62 miles of railroad track in Marin and Sonoma Counties. The surveys were performed prior to vegetation and brush removal along the railroad right-of-way as part of the NCRA railroad rehabilitation program. Exclusion buffers were established around active nests and monitoring occurred until chicks fledged or the nest was predated, assuring regulatory compliance.

Novato Creek Construction Monitoring, Napa County, California
In accordance with measures required by U.S. Fish and Wildlife Service Biological Opinion, Jason performed biological monitoring for the federally endangered salt marsh harvest mouse and California clapper rail at the North Coast Railroad crossing of Novato Creek, a tributary to San Pablo Bay. The North Coast Railroad Authority (NCRA) repaired the bridge by replacing damaged and rotting creosote pilings and stringers with epoxy treated lumber. Neither of the listed species was encountered during monitoring, and the work was completed in compliance with prescribed avoidance and conservation measures.

Wilder Development and Mitigation, Orinda, California
The project is a 978-acre site which is located in west-central Contra Costa County, primarily within the City of Orinda. The site is bordered on the west by open space lands owned by EBMUD and EBRPD, and includes the headwaters of Brookside and Moraga Creeks. Sensitive species include Alameda Whipsnake, California Red-legged Frog, Foothill Yellow-legged Frog, and Western Pond Turtle. Jason's work on this project includes biological monitoring for all of these species, participation in sampling for aquatic invertebrates, and surveys for breeding birds and amphibians.

Lockheed Martin Biological Assessment, Sunnyvale, California
A Lockheed Martin facility in Santa Clara County required a biological resources assessment for the purposes of performing maintenance on an approximately six-acre storm-water detention pond. Jason was the biologist responsible for the assessment, which included both terrestrial and freshwater-aquatic habitats in its scope. Jason also co-prepared a subsequent assessment of potential impacts to benthic habitat and organisms to help gain project approval from the Regional Water Quality Control Board.

Monarch Roost Surveys, San Mateo County, California
Monarch butterfly winter roost surveys were required of a client in the Half Moon Bay, California area to determine the extent of the species in the project area. Jason performed a habitat assessment for monarch butterflies and conducted several monarch roost surveys at various field sites. Jason was responsible for leading a team of biologists through monarch habitat to determine if the area was being used by over wintering butterflies.

Richmond Shoreline California Clapper Rail Surveys, Richmond, California
Jason participated in a survey effort for California clapper rail conforming to USFWS protocol at a site along the East Bay shoreline in Richmond. The purpose of the surveys was assessing potential impacts to rails from a proposed development project. Jason had positive detections of clapper rail during the surveys, and this information was incorporated into a report to the client.

Novato Creek Bridge Rehabilitation, Novato, California
The City of Novato buttressed a municipal bridge support and created a temporary diversion of Novato Creek. A biological monitor was required due to concerns about potential impacts to central California coast Steelhead. Jason performed a pre-construction survey and determined that this species was present. Working under a supervisor’s permit, Jason was responsible for moving all Steelhead (and other native fishes) in the Project Area downstream before construction initiation, as well as biological monitoring during all phases of the project.

Jefferson-Martin Transmission Line Replacement, San Mateo County, California
Jason performed biological monitoring for a major PG&E transmission line replacement project on the San Francisco peninsula. Special status species of concern included San Francisco Garter Snake and California Red-legged Frog. Jason also performed breeding bird surveys in a variety of habitat types associated with the project’s footprint.

Santa Clara County Bridge Scour Repair, Santa Clara County, California
Twelve bridge locations within Santa Clara County were identified by Caltrans as having critical abutment scour necessitating repair. The Santa Clara County Roads and Airports Department, with funding from Caltrans, is completing the repairs, working with the Caltrans Office of Local Assistance. During the construction phase of this project, Jason has been part of a team of WRA biologists with expertise in the ecology, identification and field survey techniques of California red-legged frog, California tiger salamander, steelhead and least Bell’s vireo. To ensure compliance with the regulatory permits, Jason performed pre-construction surveys for California red-legged frog, California tiger salamander and least Bell’s vireo, he conducted environmental awareness training for construction personnel, and he monitored construction activities to prevent take of special status wildlife species

Ridge Top Ranch Wildlife Conservation Bank, Solano County, California
The USFWS approved translocation of California red-legged frog (CRLF) to establish a viable, self-sustaining population of CRLF at the Ridge Top Ranch. Working with a U.S. Fish and Wildlife Service 10(a)(1)(A) Recovery Permit-holder for California red-legged frog, Jason participated in a night-time and daytime survey for CRLF. Jason observed adult CRLF and received training in proper handling of CRLF and proper survey techniques, as well as disease due diligence.

Dotson Marsh Bay Trail and Habitat Restoration, Richmond, California
WRA is teamed with Questa, Inc., Ghirardelli Associates and Top Grade Construction on this San Francisco Bay Trail and habitat restoration project for the East Bay Regional Parks District. The site includes many acres of tidal and diked marsh, along with associated federal and state listed species such as salt marsh harvest mouse (SMHM), California black rail and California Ridgway's (clapper) rail (CRR). To avoid adverse impacts to the two listed rail species during the nesting season, Jason led protocol-level survey efforts for these birds. Jason's other field contributions include participation in nesting bird surveys and biological monitoring at the site during the construction phase.

Silicon Valley Clean Water 48-inch Force Main Project, Redwood City, California
Silicon Valley Clean Water (SVCW; formerly SBSA) is undertaking the 48-inch Force Main Reliability Improvement Project. The existing 2.5-mile section of force main sewer pipeline crosses several jurisdictions, and a number of environments, including urban and wetland areas. For the portion of the pipeline within Inner Bair Island, Jason has led both reconnaissance and protocol-level survey efforts for California Ridgway's (clapper) rail, including handling relevant agency correspondence. Jason has also conducted biological monitoring at the site.

Doherty Drive Bridge Replacement Project, Larkspur, California (2013)
The City of Larkspur in Marin County sought replaced the bridge along Doherty Drive over lower Larkspur Creek. WRA provided biological services during construction, and Jason was the project manager overseeing this work. WRA's services consisted primarily of biological monitoring during certain phases of construction, supervising the removal of and care for vegetation sod pieces that were returned to temporarily-impacted portions of the wetland following construction, and turbidity monitoring. CRR was observed several times at the site during construction and successfully avoided. The project was completed in compliance with relevant permits with no take of any special-status species.

Richmond-San Rafael Bridge Approach Improvement Projects, San Rafael and Larkspur, California (2016-present)
To improve traffic flow as it approaches the Richmond-San Rafael Bridge, the Transportation Authority of Marin has initiated several interrelated projects focused on improvements along East Sir Frances Drake Boulevard and the Highway 10/Bellam Boulevard interchange. These improvements include road widening and re-striping, landscape improvements, relocating street lights, and upgrading the storm water system. As part of project team led by David J. Powers and Associates, WRA is providing technical support services to the project team including production of biological technical reports for each project, handling permitting needs (e.g., BCDC permits), and conducting CRR surveys to avoid project-related impacts to this species. Jason led the rail survey effort and has provided technical work over the course of the project to date.

AKT Antonio Mountain Ranch Mitigation Bank Vernal Pool Surveys, Place County, California (2013)
WRA was hired by AKT to establish the approximately 808-acre Antonio Mountain Ranch Mitigation Bank located in Placer County, California. The primary purpose of the bank is to sell credits for vernal pool creation, vernal pool preservation, seasonal wetland restoration, riparian habitat, streams, and potential special-status plant or wildlife species. Two special-status vernal pool crustaceans, vernal pool fairy shrimp and California linderiella, were previously found at the site during wet season surveys. Claire was a part of a team of biologists under the direction of vernal pool crustacean USFWS 10(a)1(A) recovery permit holder Rob Schell (#TE-212445-2) who conducted dry season brachiopod surveys on the property in order to further establish the presence or absence and distribution of special-status vernal pool crustaceans.

Tehachapi Renewable Transmission Project Bird Nest Monitoring—Orange and Los Angeles Counties, California

The Tehachapi Renewable Transmission Project requires biologists to monitor the nest status of avian species prior to and during project construction. For this assignment, Kate searched for new bird nests and checked established nests bi-weekly along Segments 7 and 8 of the project. She then reported her observations of nesting behavior (e.g., nest building, incubation, feeding, and fledgling activity). She has monitored the nests of a variety of species, including killdeer, house finch, mourning dove, northern rough-winged swallow, barn swallow, cliff swallow, tree swallow, great blue heron, double-crested cormorant, black phoebe, California kingbird, western kingbird, northern mockingbird, American crow, common raven, Bullock's oriole, hooded oriole, red-tailed hawk, Nuttall's woodpecker, house wren, Anna's hummingbird, black-chinned hummingbird, song sparrow, bushtit, mallard, western scrub-jay, California quail, and California towhee.

Appendix B

Final Initial Study/Mitigated Negative Declaration – Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project (June 2016)

FINAL INITIAL STUDY/MITIGATED NEGATIVE DECLARATION, RESPONSES TO COMMENTS, and MITIGATION MONITORING AND REPORTING PROGRAM

FOR

Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project

Prepared for:

Las Gallinas Valley Sanitary District
300 Smith Ranch Road
San Rafael, CA 94903
(415) 472-1734

Prepared by:

Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506
Contact: Stephanie Standerfer
Vice President
(951) 686-1070

June, 2016

INTRODUCTION TO THE FINAL INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

In accordance with the California Environmental Quality Act (CEQA) Public Resources Code Sections 21000–21189.3 and the State *CEQA Guidelines* Code of California Regulations Sections 15000–15387, this Initial Study has been prepared to determine potentially significant impacts upon the environment resulting from the construction and operation of the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project (Project).

In accordance with Section 15063 of the State *CEQA Guidelines*, this Initial Study is a preliminary analysis by the Las Gallinas Valley Sanitary District (LGVSD, the District) as Lead Agency, to inform the Lead Agency decision makers, other affected agencies, and the public of potential environmental impacts associated with the implementation of the Project.

Organization of Final IS/MND

The final CEQA documents for the Project include:

- **Introduction**, which provides the context for the Final IS/MND, with applicable citation pursuant to CEQA and the State *CEQA Guidelines.*
- **Table of Contents (TOC)**, which identifies the main sections, figures, and appendices of the Final IS/MND.
- **Environmental Checklist Form**, which provides the Project Description, a brief discussion of the existing environmental setting, and environmental impact assessment.
- **References**, which includes a list of reference sources and bibliography, and list of preparers.
- **Responses to Comments**, which includes a copy of each comment letter received regarding the IS/MND. Although CEQA does not require the District to respond to non-written comments, responses have nonetheless been prepared in order to provide the District's Board of Directors with additional information upon which to base their decision.
- **Mitigation Monitoring and Reporting Program (MMRP)** prepared pursuant to State *CEQA Guidelines* Section 15097 to provide a mechanism for the District to verify implementation of the mitigation measures adopted for the Project.

Where comments received on the IS/MND and the District's responses resulted in changes to the text of the IS/MND, such changes are shown in the Final IS/MND text using the following conventions:

- Text added to the Final IS/MND is shown as <u>underline</u>
- Text deleted from the Final IS/MND is shown as ~~strikethrough~~

The textual changes to the Final IS/MND do not constitute "substantial revision" as defined in State *CEQA Guidelines* Section 15073.5(b); therefore, recirculation of the IS/MND is not required.

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ENVIRONMENTAL CHECKLIST FORM

1. **Project title:** Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project

2. **Lead agency name and address:**

   Las Gallinas Valley Sanitary District
   300 Smith Ranch Road
   San Rafael, CA 94903
   (415) 472-1732

3. **Contact person email address and phone number**:
   Michael P. Cortez, PE, District Engineer
   mcortez@lgvsd.org
   (415) 472-1734

4. **Project location**: Las Gallinas Valley Sanitary District, 300 Smith Ranch Road, San Rafael, CA 94903

5. **Project sponsor's name and address:**

   Las Gallinas Valley Sanitary District
   300 Smith Ranch Road
   San Rafael, CA 94903
   (415) 472-1732

6. **General plan designation:** City of San Rafael: Public – Quasi-Public, Open Space
   Marin County: Public Facility, Planned Designation: Agricultural and Environmental Resource Area

7. **Zoning:** City of San Rafael: Public/Quasi-Public (P/QP), Public/Open Space (P/OS), Public/Open Space - Wetland Overlay (P/OS-WO)
   Marin County: Agriculture, Limited (A2)

8. **Project Description:**

Project Description – Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

Background

The proposed Project is the Las Gallinas Secondary Treatment and Recycled Water Plant Upgrade Project (Project) located at the Las Gallinas Valley Sanitary District (LGVSD, the District) wastewater treatment plant (WWTP) on Smith Ranch Road in the Las Gallinas Valley between the cities of San Rafael and Novato in Northern California as shown in **Figure 1 – Vicinity Map**. The current WWTP facility is an active wastewater treatment plant that serves approximately 30,000 customers in northern San Rafael. The District currently provides secondary treatment of wastewater from mainly commercial and domestic sources within its service area. Effluent is discharged into Miller Creek, a tributary of San Pablo Bay. During the dry season, effluent is diverted to the District's onsite reclamation facilities which include a marsh pond, irrigated pasture, two storage ponds, and public trails. The Project includes upgrades to the secondary treatment process and facilities at the WWTP, and includes replacement of the force main that heads southwest along the WWTP access road. The total project area is 13.47 acres, as shown in **Figure 2 – Project Site**.

The current WWTP has secondary treatment capacity limited to about 9 Million Gallons per Day (MGD) under peak wet weather flow conditions. The WWTP experiences a number of wet weather events each year with flows above 9 MGD that require primary effluent to be routed around the secondary and tertiary process and blended with secondary/tertiary effluent for combined disinfection and discharge. Although the WWTP's current permit allows this wet weather flow routing, the Regional Water Quality Control Board (RWQCB) is requiring more documentation each permitting cycle to justify less than secondary treatment of all flows. The current capacity limitation is due to a single secondary clarifier that can only handle flows up to 9 MGD. Construction of additional secondary clarifiers would alleviate this limitation during wet weather conditions.

The WWTP currently produces effluent with relatively high suspended solids/turbidity due to existing trickling filters and nitrifying filter. Effluent quality can be improved by adding an activated sludge process that improves suspended solid and turbidity removal.

Over the coming permit cycles, it is possible that higher levels of nutrient removal will be required including nitrogen and phosphorous removal. Activated sludge processes improve effluent quality and provide conditions that allow for nitrogen and phosphorous removal.

The plant has faced discharge issues from the chlorine contact basin (CCB) into Miller Creek, which is influenced by tides and high water levels during storm events. Miller Creek is also expected to have a water surface elevation increase due to sea level rise during the next 100 years. Discharge issues due to creek depth can be alleviated by raising the secondary treatment and secondary clarification processes to create sufficient head availability, allowing discharge to continue during these storm events or increases in stream depth.

Project Components

The Project will provide an expansion of the plant to handle peak wet weather daily flows of 18 MGD, doubling the plant's wet weather treatment capacity. In order to add the additional capacity for wet weather treatment, the existing trickling filters and fixed film reactor will be removed from the treatment train and replaced with a combined fixed-film, activated sludge process which will result in improved effluent quality and the ability to reduce nutrients from the effluent. To maintain treatment capacity in the WWTP, the primary trickling filter will be taken offline first. The 3 feet of rock media will be removed and the rotary distributor will be raised approximately 3 feet and modified to accommodate the installation of 6 feet of new plastic media. With this modification, the primary trickling filter will be placed in service, allowing the secondary trickling filter to be removed from service, demolished, and the activated sludge processes to be constructed in its place.

A 1.2 million gallon equalization basin will be constructed within the boundaries of the current WWTP to handle the potential peak hourly flows anticipated up to 25 MGD. The EQ basin will be built adjacent to the primary clarifiers and will share a common wall with the new primary pump station.

A new primary pump station will be constructed to regulate the flowrate of primary effluent into the secondary treatment portion of the plant. The three current pump stations after the primary clarifiers and the fan pumps, at the discharge point, will all be eliminated with this new primary pump station.

STM AerotorTM technology will be used for the fixed-film activated sludge process due to the low power requirements inherent to its design. There will be four treatment trains, each equipped with three STM Aerotors TM. There will also be dedicated anaerobic and anoxic tanks in each train.

Two additional secondary clarifiers will be constructed and the existing secondary clarifier will be modified to meet requirements for the increased flow for a total of three secondary clarifiers. A common RAS/WAS (return activated sludge/waste activated sludge) pump station/splitting structure will be placed between the clarifiers. The RAS/WAS pump station/splitting structure will provide for adequate return of activated sludge and also wasting of sludge from the process.

The CCB currently used for disinfection will require minor modifications to account for grading changes and connection changes. Discharge issues from the CCB into Miller Creek, which is influenced by tides and high water levels during storm events, will be alleviated by raising the secondary treatment and secondary clarification processes to create sufficient head availability during these storm events or increases in stream depth. The outfall box houses a 36" diameter axial fan wall pump that allows discharge from the box to enter Miller Creek when the water surface (WS) in the creek is above the WS elevation in the box. The splitter box that introduces sodium hypochlorite into the final clarifier effluent will be tall enough to provide sufficient head to push flow through the CCB and into Miller Creek even when the creek is at higher elevations.

As a part of the upgrade, the Recycled Water Facility will be expanded to treat its designed capacity of 5.4 MGD to maximize the plant's ability to provide recycled water. This will include electrical upgrades, the addition of the membrane, other ancillary equipment in the building, pump replacement, feed water pretreatment, and possibly internal wall modifications to the existing chlorine contact/storage basin. The building is located between the existing secondary bio-filter and the deep bed filters, see **Figure 4 – Site Plan**. This recycled water expansion will allow for the removal of the Marin Municipal Water District (MMWD) recycled water facility, which is located onsite. The MMWD has reached its useful life and its footprint is required to accommodate the secondary treatment upgrade.

There are three viable options in terms of combined primary sludge (PS) and waste activated sludge (WAS) thickening including dissolved air floatation thickening (DAFT), disk thickeners, and centrifuge thickeners of which one will be chosen by the District during the design portion of the Project. The RAS/WAS Thickening Facility can be completed at any time during Project construction.

The Project will involve construction of new structures and the piping between them. The Project will also include 2600 feet of new piping as a part of the replacement of the existing force main along Smith Ranch Road as shown in **Figure 2 – Project Site**. The new force main will replace an existing force main in the same alignment as the existing line. The entire 2,600 foot length includes replacing an 18-inch line with a new 24-inch line except for the last 800 feet which will be replacing an existing 28-inch line with a new 28-inch line.

The main road will be realigned and raised from the middle of the facility to the perimeter to account for potential sea level rise issues along with storm events. This will also improve the overall plant layout and move public traffic outside the plant fence line. The laboratory building needs to be relocated between the existing administration building and mechanical building to allow for road realignment. The 3,600 sf administration building will be modified or demolished and reconstructed to accommodate the lab relocation. Plant improvements require that some of the power poles and overhead power along the road be relocated to the eastern boundary of the facility along with the road. These modifications will include 2 or 3 power poles being relocated and the road being modified as shown in the site plan, **Figure 4**.

The plant upgrade requires the removal of the existing lagoons on the east side of the facility, which allow the road and public access to be moved outside the plant perimeter and provide space for secondary clarification.

These lagoons will be demolished with the vegetation being removed legally from the site along with any connecting piping, manholes, and miscellaneous structures. This area will be leveled and raised as required to accommodate the installation of the secondary clarification process and the adjacent roadway re-alignment.

Upgrades will also be made to the electrical systems at the plant. Newly constructed facilities and pumps will require electrical gear located in a new electrical building or in existing buildings, as feasible. Some of the existing duct banks, electrical vaults and boxes will likely need to be abandoned, relocated, or modified facility-wide. In addition, the proposed build out would require a new utility transformer, service entrance located adjacent to the headworks area mechanical/electrical building and new metering equipment which would be coordinated with PG&E. The existing indoor generator in the Headworks Building will be replaced with a larger, outdoor, sound attenuated generator assembly. The empty space from the existing generator would be filled by new power distribution equipment that requires some modification to the interior of the Headworks Building.

The existing primary and secondary treatment processes do not currently have odor control components. Potential odor control work includes: (1) containing foul air around the screens and grit removal along with the channels in the headworks area; (2) covering the launders on the primary clarifiers and removing foul air; (3) containing foul air from the thickening process; and (4) passing collected foul air through a biofilter, chemical scrubber, or ionization unit that will remove foul smelling components from the air prior to its discharge.

Construction Phasing

The Project will be implemented in four phases to allow for the construction of the new processes while maintaining treatment capabilities with existing processes. One of the project goals is to improve the overall site layout by having processes placed in their order of treatment while moving through the plant. Accomplishing this requires existing process removal to allow for replacement process construction in the correct locations. However, the effluent treatment requirements must be met through online treatment processes, which complicates this effort. By splitting construction into four phases, treatment capabilities are maintained while the new processes are constructed and implemented. The phases will be constructed in series with the total project requiring between 24-30 months for completion. Major components of the four project phases are outlined in the following paragraphs:

Phase 1 – Phase 1 will include the preparatory work required for the remaining work to proceed, including temporary items required to meet permit conditions during the construction. Phase 1 includes the following:

- Removal of primary trickling filter rock media and modification of distributor (non-discharge season)
- Installation of temporary plastic media in primary trickling filter (non-discharge season)
- Addition of polymer equipment at headworks
- Demolition and grading of lagoon area #2
- Construction of new lab facility and existing administration building modifications (or demolition and reconstruction, if need be)
- Construction of Primary Pump Station
- Expansion of Recycled Water Facility
- Modification of RAS/WAS Thickening Facility
- Realignment of overhead power
- Construction of new secondary clarifier effluent box
- Modification to CCB
- Phase Timeline is 5-7 months

Phase 2 – This phase includes the items that cannot be done until the Phase 1 items are complete.

- Demolition of Marin Municipal Water District (MMWD) facility within the treatment plant facility
- Demolition of existing lab
- Realignment of plant road
- Phase Timeline is 2-4 months

Phase 3 – Once the primary trickling filter has been modified as part of Phases 1 and 2 and is completely started back up and fully functioning, Phase 3 work can begin, including the following:

- Demolition of secondary trickling filter
- Construction of combined Secondary Clarifier/RAS Splitting Structure
- Construction of STM Aerotor Basins
- Construction of Secondary Clarifier No 2 (could be started in Phase 1B)
- Phase Timeline is 8-10 months

Phase 4 – Once the STM Aerotor process and primary pump station are installed, started up, and completely functional the Phase 4 work can commence as follows:

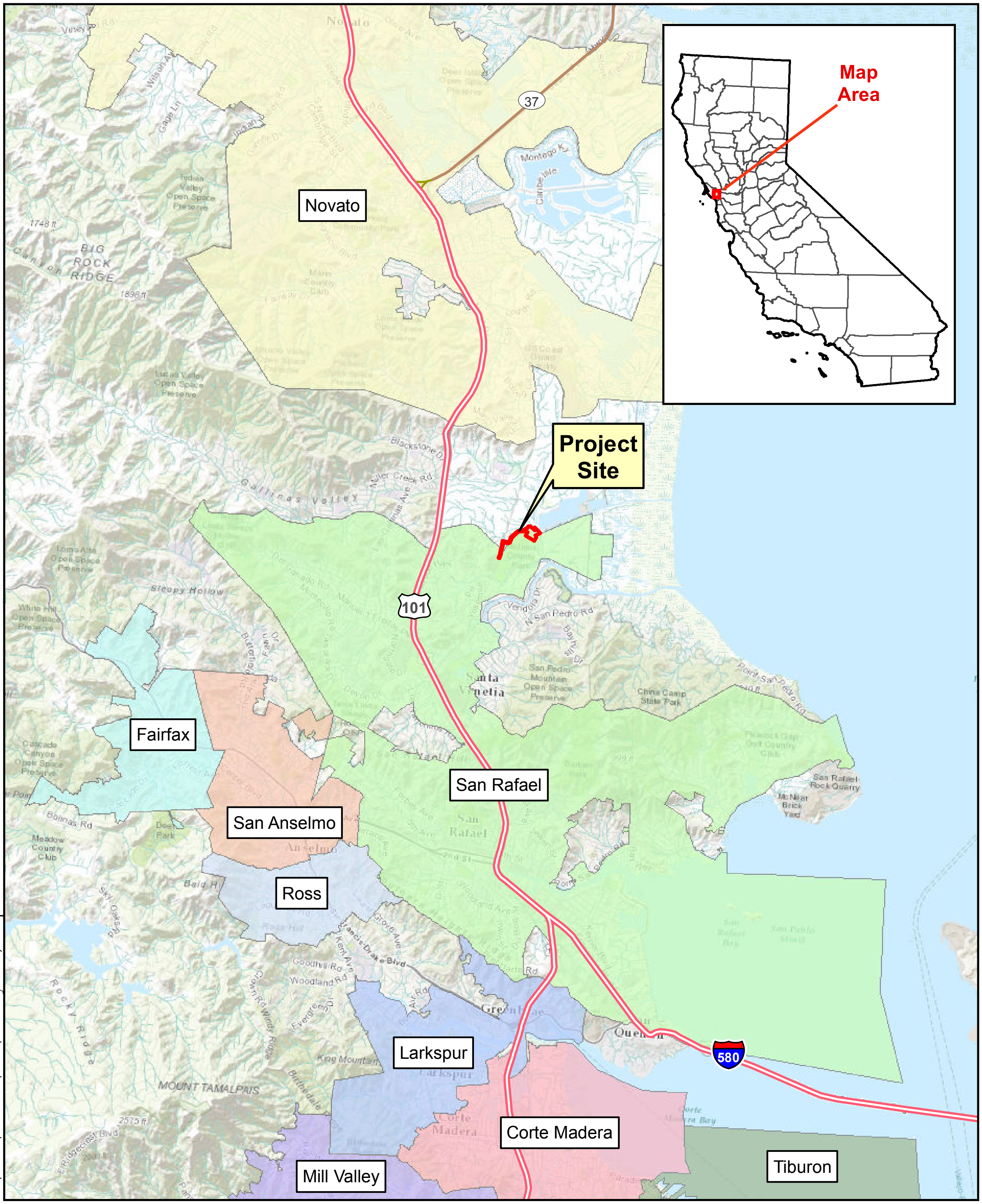
- Demolition of fixed film reactor (bid alternate)
- Demolition of primary trickling filter
- Modification of Clarifier No 1
- Construction of Clarifier No 3 (bid alternate)
- Construction of Anaerobic and Anoxic Basins
- Construction of Equalization Basin
- Phase Timeline is 8-10 months

9. Surrounding land uses and setting:

The Proposed project area is within the LGVSD WWTP facility and along Smith Ranch Road to the west of the Plant. The project area is surrounded by mostly park and open land. The LGVSD WWTP associated habitat pond, storage ponds, and solar field are located to the northeast of the project area. Pasture land owned by the Silveira family is located directly north of the project site. The John F. McInnis County Park and Golf Club are located to the south and southeast of the project area. The Helen Vine Detox Center is located to the west of the project site.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):

- Bay Area Air Quality Management District, Air Quality Permits
- State Water Resources Control Board, Financial Assistance – Clean Water State Revolving Fund, Water Recycling Funding Program
- US Army Corps of Engineers, a Clean Water Act Section 404 Permit, if required
- Regional Water Quality Control Board, San Francisco Bay Region, if a Section 404 Permit is required, then a Section 401 Water Quality Certification will be required
- California Department of Fish and Wildlife, a Fish and Game Code Section 1600 Streambed Alteration Agreement, if required



Sources: Marin Co. GIS, 2015;
ESRI/USGS

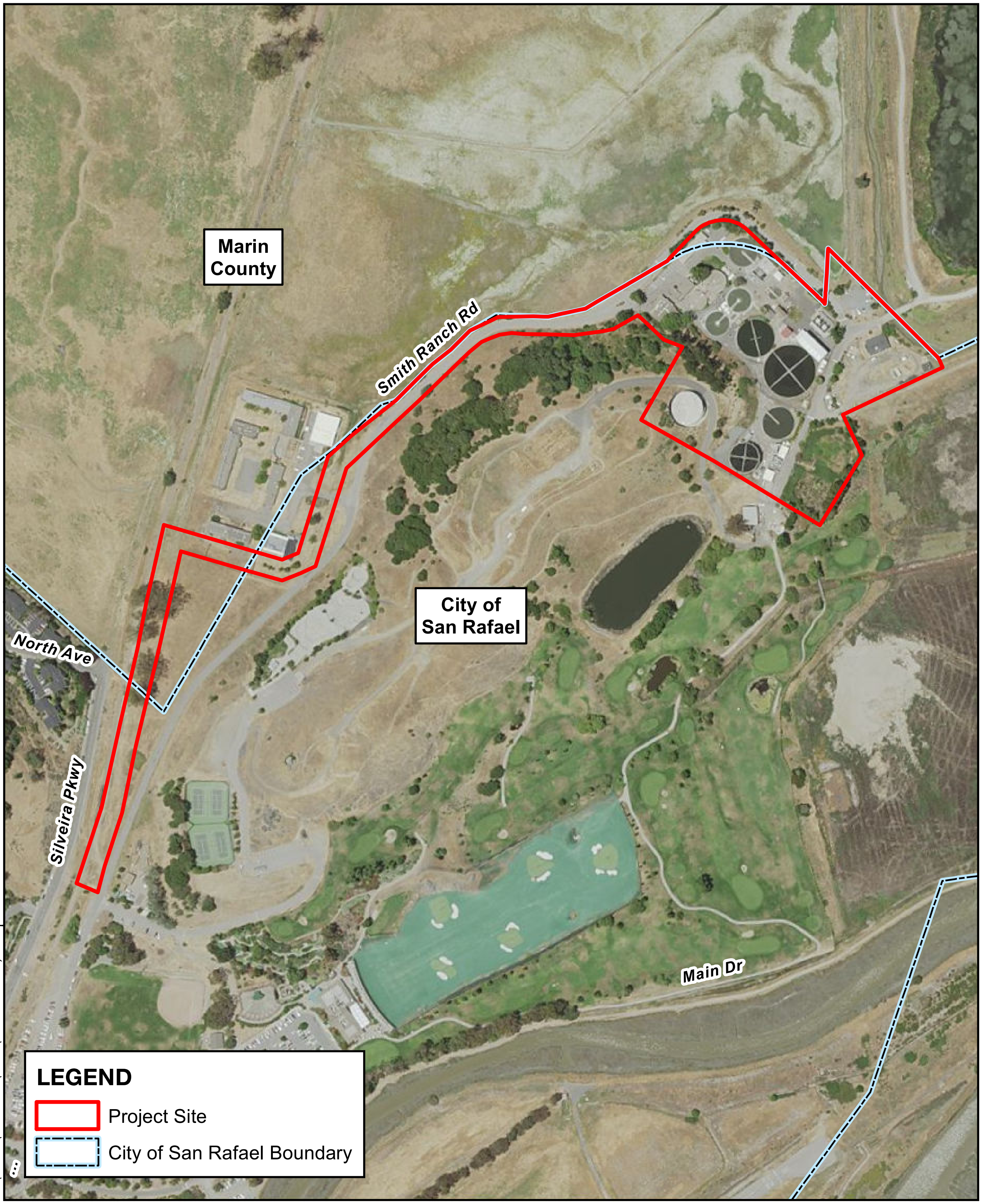
Figure 1 - Vicinity Map

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

G:\2015\15-0154\GIS\Vicinity.mxd; Map created 08 Mar 2016

0,2,000,000
Feet

ALBERT A. WEBB ASSOCIATES



G:\2015\15-0154\GIS\Aerial.mxd; Map created 17 Mar 2016

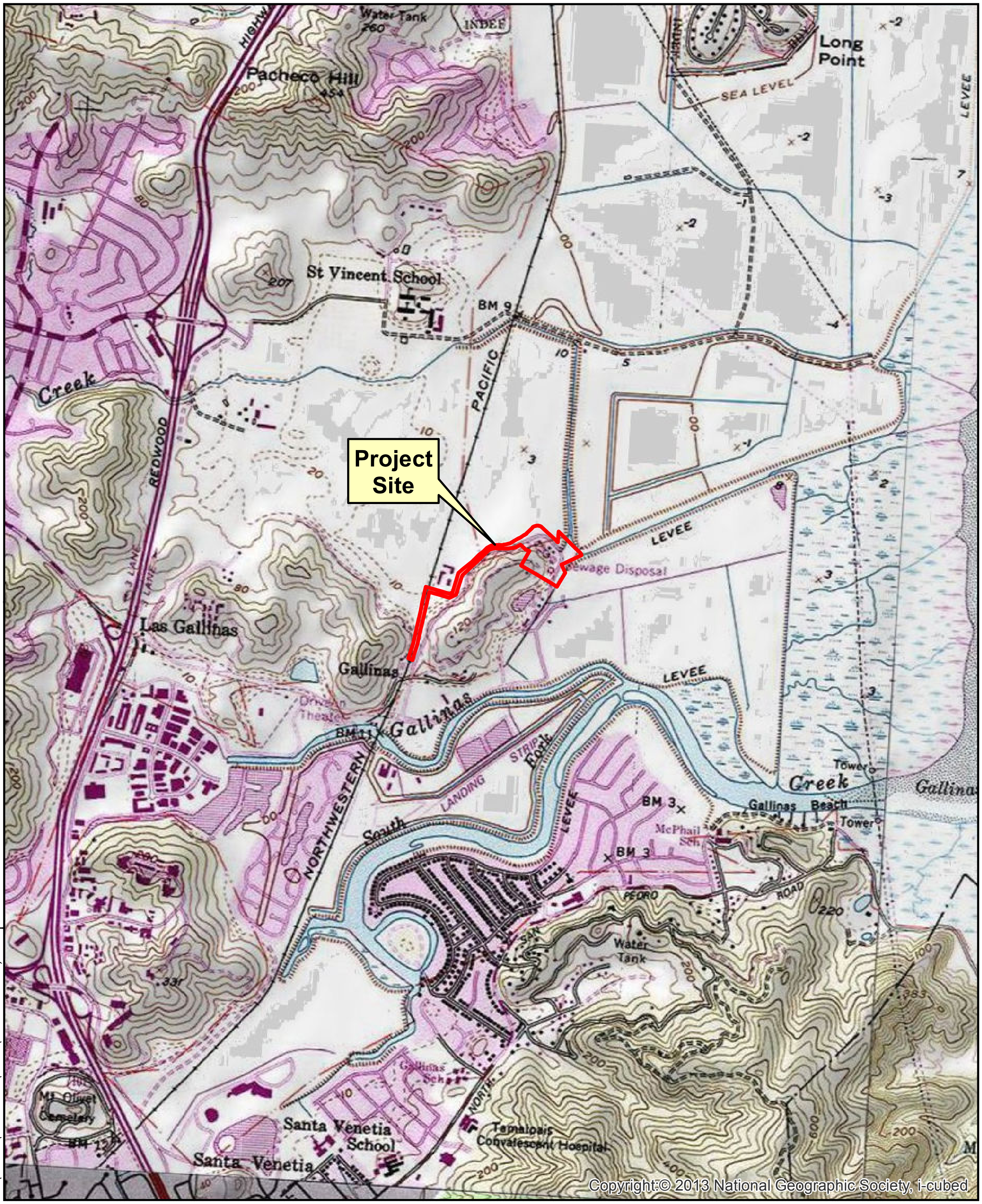
Sources: Marin Co. GIS, 2015;
USDA NAIP imagery, 2014.

0 200 400 600 800 Feet

Figure 2 - Project Site

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

ALBERT A. WEBB ASSOCIATES



G:\2015\15-0154\GIS\USGS.mxd; Map created 08 Mar 2016

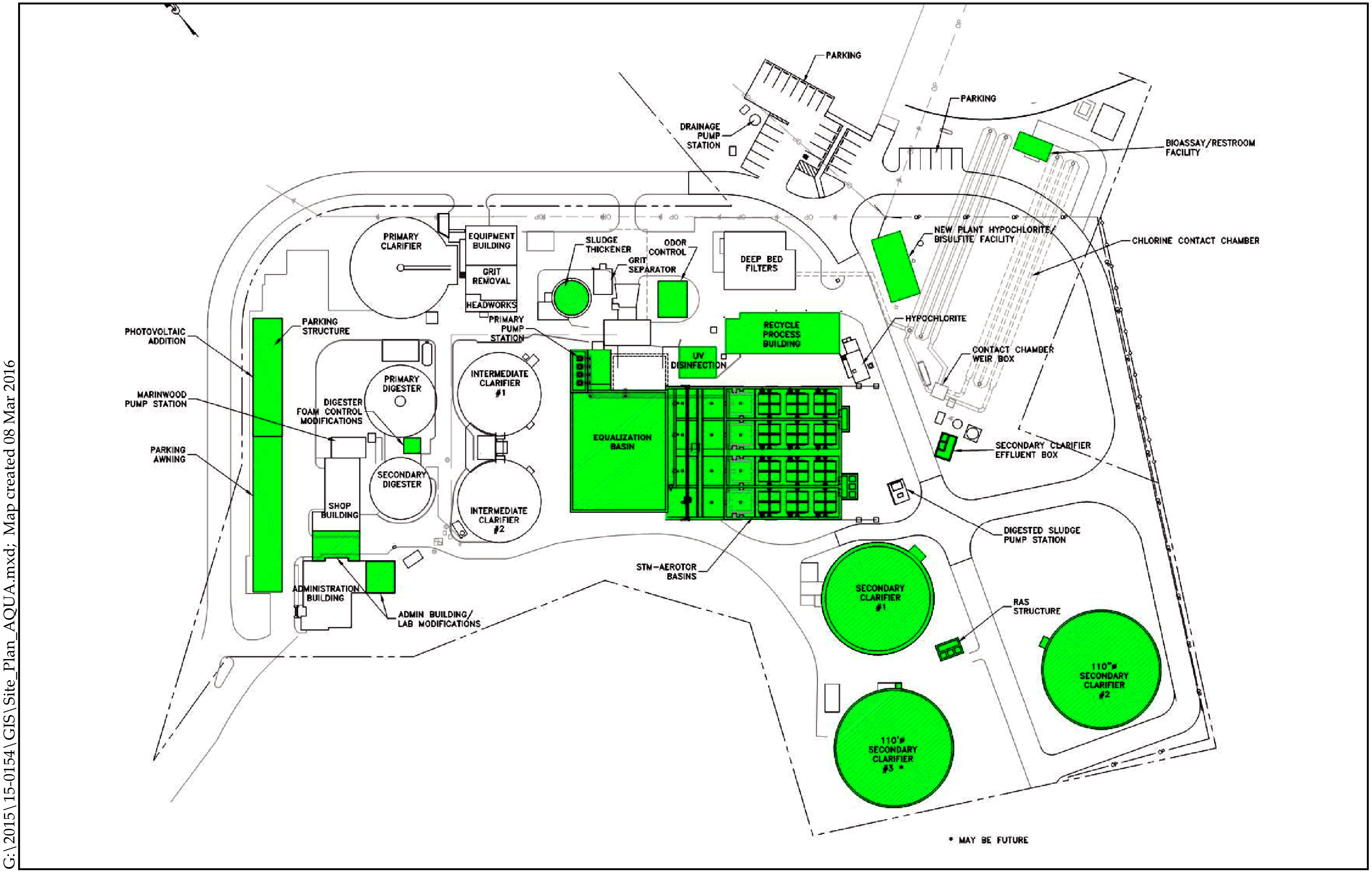
Sources: Marin Co. GIS, 2015; ESRI/USGS

0 1,000 2,000 3,000 Feet

Figure 3 - USGS Map

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

ALBERT A. WEBB ASSOCIATES



Source: Aqua Engineering, 2016.

Figure 4 - Site Plan

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

Not to Scale

ALBERT A. WEBB ASSOCIATES

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages:

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/Service Systems	☐ Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ 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 the mitigation measures described on an attached sheet have been added to the project. 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" impact 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 or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project.

Signature ______________________________ Date ________________

Michael P. Cortez, PE, District Engineer
Printed Name

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved *(e.g., the project falls outside a fault rupture zone)*. A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards *(e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis)*.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). Earlier analyses are discussed below:

   a. **Earlier Analysis Used.** Identify and state where they are available for review.
   b. **Impacts Adequately Addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c. **Mitigation Measures.** For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measure which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts *(e.g., general plans, zoning ordinances)*. Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated. A source list should be attached and other sources used or individuals contacted should be cited in the discussion.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) The explanation of each issue should identify:

   a. the significance criteria or threshold, if any, used to evaluate each question; and
   b. the mitigation measure identified, if any, to reduce the impact to less than significant.

ENVIRONMENTAL FACTORS: ENVIRONMENTAL CHECKLIST	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
I. AESTHETICS. Would the project:				
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. Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Aesthetics Discussion:

a) Would the project have a substantial adverse effect on a scenic vista?

Less than Significant Impact. The proposed Project area is located within the City of San Rafael (the City) and a small portion of the proposed force main realignment is within unincorporated Marin County (the County), per Figure 2. The City of San Rafael within (the County is characterized by scenic hills and valleys, as well as San Pablo and San Rafael Bays. The hills between the City and the surrounding communities are scenic topographical features. Large areas of open space that contain undeveloped ridgelines, hillsides, and oak tree groves also contribute to the natural scenic character of the area.

The Project site is located in a valley between scenic hillsides and the San Pablo Bay. Adjacent land uses include residential development, a nature preserve, recreational facilities, a wild animal hospital and educational center, and open space. The proposed Project is an upgrade to an existing Waste Water Treatment Plant (WWTP) that includes primarily low-lying structures that do not obstruct view sheds or scenic vistas. The existing storage tanks are located on hillsides and are visible from nearby neighborhoods to the southeast and roadways to the north. However, these storage tanks are surrounded by trees and shrubs that help them blend into the landscape. The WWTP is, however, shielded to the south and southwest by a hillside (See Figure 3 – USGS Map). Views to San Pablo Bay from any adjacent land uses are not restricted by the existing WWTP, nor will they be as a result of Project implementation. be consistent with what is existing on site . Therefore, because the existing conditions related to scenic vistas will not change significantly as a result of the upgrades, impacts to any scenic vistas will be less than significant.

Source: GP 2020 Exhibit 17 – San Rafael Community Design, GP 2020 FEIR

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Less than Significant Impact. The proposed Project is not located adjacent to a state scenic highway. The closest eligible state scenic highways are SR 101 and SR 37 near Novato and Ignacio, approximately 4 miles north of the Project site (CalTrans; Google Earth). These scenic highways are eligible, but not officially designated. Since the proposed Project is not located adjacent to a state scenic highway, no impact will occur in terms of damaging scenic resources within a state scenic highway.

The City of San Rafael General Plan 2020 (GP 2020) identifies North San Pedro Road as a Scenic Rural Roadway that is located approximately 1 mile southwest of the Project site. The Las Gallinas Valley Sanitary District (LGVSD) WWTP is separated by Smith Ranch Road from residential development, WildCare Silveira Ranch, the Santa Venetia Marsh Preserve, Gallinas Creek, and the John F. McInnis County Park. In addition, according to the Marin Countywide Plan

(Marin CWP), the St. Vincent's School for Boys, approximately 0.65 miles north of the Project site, is listed as a State Historical Landmark.

The proposed Project involves treatment upgrades within the existing WWTP that includes primarily low-lying structures that do not obstruct view sheds or scenic vistas. Views to San Pablo Bay and associated salt marsh habitat from any adjacent land uses are not restricted by the existing WWTP, nor will they be as a result of Project implementation. Therefore, any potential impacts will be less than significant.

Source: CalTrans, GP 2020 Exhibit 17 – San Rafael Community Design, Marin CWP Map 4-1 – Historic Resources, Google Earth

c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

Less than Significant Impact. As identified in the GP 2020 FEIR, urban growth and development have the potential to alter the existing visual character of the City. The proposed Project entails upgrades to an existing WWTP and therefore will not substantially degrade the existing visual character or quality of the site and its surroundings because the proposed facility upgrades will be similar to those structures already located on the WWTP site. Therefore, any impacts to the visual character or quality of the site and its surroundings will be less than significant.

Source: GP 2020, GP 2020 FEIR

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than Significant Impact. The proposed Project will include on-site lighting for security purposes similar to what is already located on site for the existing WWTP facility. The project design includeslight sources to be fully shielded from off-site view and downcast in order to not adversely affect surrounding uses, in particular to the marsh areas and open space areas. Therefore, escape of light to the atmosphere will be minimized and any potential impacts affecting nighttime views in the area will be less than significant.

Source: GP 2020, GP 2020 FEIR

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
II. AGRICULTURAL and FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
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?	☐	☐	☒	☐

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined n 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. 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?	☐	☐	☒	☐

Agricultural Resources Discussion:

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?

No Impact. The Project site is not located on or adjacent to any 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. The proposed Project involves upgrades to the LGVSD WWTP that currently exists on the site and therefore will not convert such Farmland to non-agricultural use. No impact will occur in this regard.

Source: DOC California Important Farmland Finder

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Less than Significant Impact. The proposed Project is within parcels with either County or City zoning. The Project site is currently zoned by the City as Public/Quasi-Public (P/QP), Public/Open Space (P/OS), and Public/Open Space with a Wetland Overlay (P/OS-WO). Per GP 2020, there are zero acres of agricultural land within the City planning area.

The proposed Project does not conflict with any existing Williamson Act contracts; however, the proposed Project area within County jurisdiction is within agriculturally zoned land (Agriculture Limited – A2) which is not protected by conservation easements or Williamson Act contracts. The proposed force main replacement (see Figure X) is within the area that is zoned A2. . Since the replacement will have the same alignment as the existing line, the proposed Project will not conflict with the existing agricultural zoned uses. Therefore, any impacts relating to existing zoning for agricultural use or Williamson Act contracts would be less than significant.

Source: GP 2020 Exhibit 12 – Land Use Map, GP 2020 FEIR Exhibit IV.1-1 – Proposed Changes to Land Use Categories, Exhibit IV.1-3 General Plan Land Use Designations, Existing and Proposed, Appendix VIII.1 – Initial Study, Zoning Information, Marin CWP Map 2-20 – Protected Agricultural Lands

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined n 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))?

No Impact. The Project site is currently zoned by the City as Public/Quasi-Public (P/QP) and Public/Open Space with a Wetland Overlay (P/OS-WO). Per GP 2020, the City does not contain any forest land, timberland, or timberland zoned

Timberland Production within the City planning area. The Project site is zoned by the County as Agriculture Limited (A2). Therefore, the proposed Project will not conflict with existing zoning for or cause rezoning of forest land, timberland, or timberland zoned Timberland Production and no impacts will occur.

Source: GP 2020 Exhibit 12 – Land Use Map, GP 2020 FEIR Exhibit IV.1-1 – Proposed Changes to Land Use Categories, Exhibit IV.1-3 General Plan Land Use Designations, Existing and Proposed, Appendix VIII.1 – Initial Study, Zoning Information

d) 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?

Less than Significant Impact. Per GP 2020, the City does not contain any agricultural land or forest land within the City planning area. The portion of the Project site within the County is designated as locally important farmland, within the County designated Agriculture, Limited (A2) zone. The portion of the proposed Project on County land is the proposed force main replacement that is in the exact location as the existing pipes within a roadway.

Because the Project site is located within the existing LGVSD WWTP and replacing existing pipelines, the proposed Project will not result in the conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use. Therefore, any potential impacts will be less than significant.

Source: GP 2020 Exhibit 12 – Land Use Map, GP 2020 FEIR Exhibit IV.1-1 – Proposed Changes to Land Use Categories, Exhibit IV.1-3 General Plan Land Use Designations, Existing and Proposed, Marin CWP Map 2-20 – Protected Agricultural Lands

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c. 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Air Quality Discussion:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact. The proposed Project is located within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The proposed Project would not conflict with BAAQMD air quality planning goals because Project elements would be required to comply with all applicable BAAQMD rules and requirements during construction and operation (e.g., visible emissions, nuisance, fugitive dust, boilers/heaters, emergency generators, etc.).

The proposed Project would also necessitate modifying the facility's existing BAAQMD operating permit due to the changes in processes, equipment, and resulting emissions. The BAAQMD permitting process would ensure that the Project meets regulatory requirements through the application review process and by placing specific operating conditions on the modified permit. Compliance with the rules, regulations, and permit conditions would ensure that the Project would not conflict with or obstruct implementation of applicable air quality plans.

Also, in accordance with the BAAQMD's CEQA guidelines, the proposed Project would need to develop and comply with a construction fugitive dust control plan. In general, full and proper implementation of fugitive dust control measures at the construction site, principally surface watering several times per day, reduces fugitive dust impacts to less than significant.

Source: AQ/GHG Analysis prepared by Yorke, March 2016

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than Significant Impact. The proposed Project would be required to comply with all applicable BAAQMD rules and requirements during construction and operation which would support maintenance of generally good air quality in the Project Area. Due to the relatively small scale of the proposed Project, construction and operational emissions impacts would be relatively small.

A project's construction phase produces many types of emissions, but PM10 (including PM2.5) in fugitive dust and diesel engine exhaust are the pollutants of greatest concern. Fugitive dust emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle exhaust. Construction-related emissions can cause substantial increases in localized concentrations of PM10, as well as affecting PM10 compliance with ambient air quality standards on a regional basis. The BAAQMD's approach to CEQA analyses of fugitive dust impacts is to require implementation of effective and comprehensive dust control measures rather than to require detailed quantification of emissions. The BAAQMD has determined that compliance with an approved fugitive dust control plan, primarily through frequent water application, constitutes sufficient mitigation to reduce PM10 impacts to a level considered less than significant.

As shown in Table 3.1, all daily construction impacts would be less than significant, however, as required by BAAQMD, fugitive dust controls – in the form of Best Management Practices (BMPs), listed below – would further reduce generation of fugitive dust and hence local impacts in the vicinity of the Project, which are included as **MM AQ 1**. Also, while not mitigation per se (i.e., ministerial regulatory requirements), all painting materials purchased for the proposed Project would comply with BAAQMD Regulation 8, Rule 3: Architectural Coatings, which requires coating manufacturers to limit the VOC contents of products offered for sale within BAAQMD jurisdiction.

Table 3.1. CalEEMod Model Results Estimated Criteria Emissions Summary and Significance Thresholds Evaluation – Construction						
Activity	Maximum Daily Emissions (lbs/day)					
	ROG (VOC)	NO_x	CO	SO_2	PM-10	PM-2.5
BAAQMD Daily Thresholds Construction	54	54	None	None	82	54
Daily Project Emissions - Construction	3.5	24.9	21.2	0.03	3.7	2.4
Exceeds Y/N Threshold?	N	N	N	N	N	N

Source: Table 3-4 and 3-5, AQ/GHG Analysis

The term "project operations" refers to the full range of activities that can or may generate pollutant emissions when the development is functioning in its intended use. For projects such as office parks, shopping centers, residential subdivisions, and other indirect sources, motor vehicles traveling to and from the project represents the primary source of air pollutant emissions. For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint. CEQA significance thresholds address the impacts of operational emission sources on local and regional air quality. Thresholds are also provided for other potential impacts related to project operations, such as odors and TACs. Particular to this Project, since the WWTP is an existing permitted stationary source of criteria air pollutants, TACs, and GHGs, only the net change in operational emissions, i.e., post-project minus pre-project, was evaluated for CEQA significance.

As shown in Table 3.2, daily operational ROG impacts would be less than significant with respect to CEQA significance thresholds. In addition, all annual operational impacts of ROG and TACs would also be less than significant with respect to CEQA significance thresholds and BAAQMD's Toxic Air Contaminant Trigger Levels. The transient exception is tetrachloroethylene (perchloroethylene) which is no longer considered generally applicable. This is due the general phase-out of PERC as a common dry cleaning agent since the waste water treatment EETs (Appendix B) were initially developed by the EPA in the 1990s (BAAQMD 2013b). The phase-out of PERC, along with phase-outs of other chlorinated solvents (e.g., 1,1,1-TCA and TCE), have substantially reduced evaporative emissions of these substances from waste water treatment processes over the past two decades. In addition, the screening risk assessment presented in d) demonstrates that notwithstanding such phase-outs, risks to nearby receptors would nevertheless be less than significant.

Table 3.2. Estimated Emissions Summary and Significance Thresholds Evaluation – Net Daily Operational Change					
Criteria Pollutants & TACs	Maximum lbs/day	Threshold lbs/day	Annual lbs/yr	Threshold lbs/yr	Exceeds Y/N Threshold?
Reactive Organic Gases (ROG)	3.89	54	78.8	20,000	N
Chloroform	0.98	None	20.0	20.0	N
Benzene	0.09	None	1.8	3.8	N
Methyl Chloroform (1,1,1-TCA)	2.71	None	55.0	39,000	N
Methylene Chloride	2.34	None	47.5	110.0	N
Trichloroethylene (TCE)	0.27	None	5.5	54.0	N
1, 4-Dichlorobenzene	0.13	None	2.5	9.50	N
Toluene	0.69	None	14.0	12,000	N
Tetrachloroethylene (PERC)	0.91	None	18.5	18.0	Y*
Xylenes	0.82	None	16.5	27,000	N

Source: Table 3-6, 3-7, & 3-8, AQ/GHG Analysis
*Note: No longer applicable and not a significant risk (see discussion above)

BMPs for Construction Related Emissions
The following BMPs would be implemented as part of the Project so that all construction-related emissions, including fugitive dust, would result in less than significant impacts (BAAQMD 2011, 2010b):

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. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of CCR). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator if visible emissions are apparent to onsite construction staff.

8. A publicly visible sign shall be posted with the telephone number and 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 phone number shall also be visible to ensure compliance with applicable regulations.

With the incorporation of BAAQMD construction-related BMPs, air quality impacts of the proposed Project construction would be less than significant.

Source: AQ/GHG Analysis prepared by Yorke, March 2016

c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less than Significant Impact. Mitigated fugitive dust emissions would not exceed CEQA thresholds for construction of the proposed Project. As described in b) above, all other Project-related emissions of criteria pollutants, including NO_x and ROG, would not exceed CEQA thresholds.

Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Therefore, since temporary construction emissions and changes in operational emissions would be less than significant with incorporation of BAAQMD construction-related BMPs, the cumulative air quality impact would also be less than significant with mitigation.

Source: AQ/GHG Analysis prepared by Yorke, March 2016

d) Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. The nearest receptors to the facility are institutional (worker) and residential: WildCare Silveira Ranch is 300 meters (980 feet) southwest and the McInnis Park Apartments are 600 meters (1,970 feet) southwest. Any project with the potential to expose sensitive receptors (including residential areas) or the general public to substantial ambient levels of toxic air contaminants (TACs) would be deemed to have a potentially significant impact. This applies to receptors locating near existing sources of TACs, as well as TAC sources locating near existing receptors. Particular attention must be placed on either 1) the location of a new facility that has the potential to emit TACs within 1,000 feet of an existingschool, or 2) the location of a new school within 1,000 feet of an existing facility that has the potential to emit TACs. There are no schools located within 1,000 feet of the proposed Project.

A screening-level health risk assessment (SHRA) for DPM was performed to demonstrate that maximum risks to the nearest receptors (i.e., residents and workers) during Project construction would be below significance thresholds with incorporation of BAAQMD construction-related BMPs. Similarly, a SHRA was also performed for estimated absolute post-project operational emissions of TACs from the upgraded WWTP. The results of both risk assessments, which are conservative, show that no unacceptable risks to nearby residents and workers would result from the proposed Project. Therefore, impacts related to sensitive receptors is considered less than significant with incorporation of BAAQMD construction-related BMPs.

Source: AQ/GHG Analysis prepared by Yorke, March 2016

e) Create objectionable odors affecting a substantial number of people?

Less than Significant Impact. While odors rarely cause any physical harm, they can be unpleasant, often generating citizen complaints to local governments and the BAAQMD. Any project with the potential to frequently expose the public to objectionable odors in violation of BAAQMD Regulation 1, Rule 301: Nuisance and Regulation 7: Odorous Substances would be deemed to have a significant impact. Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. Specifically, Rule 301 states that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30 day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct.” The existing WWTP has no such notices on file. The improved WWTP is not expected to create objectionable odors at the nearest residential and worker receptors.

In addition, the existing primary and secondary treatment processes do not currently have odor control components. Potential odor control work includes: (1) containing foul air around the screens and grit removal along with the channels in the headworks area; (2) covering the launders on the primary clarifiers and removing foul air; (3) containg foul air from the thickening process; and (4) passing collected foul air through a biofilter, chemical scrubber, or ionization unit that will remove foul smelling components from the air prior to its discharge. Therefore, any potential impacts would be less than significant.

Source: AQ/GHG Analysis prepared by Yorke, March 2016; Project Description

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
IV. BIOLOGICAL RESOURCES. Would the project:				
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 federally protected wetlands as defined by Section 404 of the Clean Water Act (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?	☐	☐	☐	☒

Biological Resource Discussion:

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?

Less than Significant Impact with Mitigation. Field biological reconnaissance surveys were conducted on December 9, 2015, by Dudek wildlife biologists. During these field reconnaissance surveys, all terrestrial and aquatic habitat areas within and adjacent to the Project area were evaluated.

Special-status biological resources present or potentially present within the Project area were identified through a literature search using the following sources: U.S. Fish and Wildlife Service (USFWS) Information, Planning and Conservation (IPaC) Trust Resources Report; California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB); and the California Native Plant Society (CNPS) online Inventory of Rare and Endangered Vascular Plants. Historical aerial photography (Google Earth 2016) was used to determine areas of the site that could potentially contain jurisdictional Waters of the U.S. or Waters of the State.

A CNDDB records search was conducted for the Novato USGS 7.5-minute quadrangle and the surrounding eight quadrangles (CNDDB 2003, December 2015 update). Dudek also conducted a CNPS search for the Novato USGS 7.5-minute quadrangle and the surrounding eight quadrangles (CNPS, December 2015 update). In addition to state and federally-listed species, California Rare Plant Rank (CRPR) 1 and 2 plant species were included in this search. The IPaC Trust Resources Report was generated from an approximately five-mile radius around the Project area.

Results of the CNDDB and CNPS searches revealed 15 special-status plant species that have potential to occur on or in the vicinity of the Project area (Bio Assessment, Appendix A). Of these 15 species, 14 species were eliminated from consideration due to the lack of suitable habitat conditions or the Project area is outside the species range. The remaining plant species, soft salty birds-beak (*Chloropyron molle ssp. molle*) is a semi-parasitic annual herb in the Orobanchaceae family. It occurs in coastal salt marshes and swamps between zero and 10 feet above mean sea-level and blooms from July to November. Although coastal salt marsh habitat does not occur within the Project area, it occurs adjacent to the northern and eastern boundaries of the Project area. Furthermore, due to the proximity of the treatment plant to San Francisco Bay and surrounding expanses of relatively undisturbed baylands, there is increased potential for special-status plants to occur in portions of the Project area that have remained undeveloped (e.g., areas along the force main alignment). Therefore, in order to confirm presence/absence of special-status plants, focused surveys for soft salty bird's-beak and other rare plants should be conducted by a qualified botanist during the blooming period(s) of the target species.

Results of the CNDDB and IPaC searches revealed 19 special-status animal species (species that are listed or proposed for listing as rare, threatened, or endangered by either the USFWS or CDFW). Of the 19 species, 16 species were removed from further consideration due to lack of suitable habitat conditions within the Project area, or the Project area is outside of the species range.

A habitat assessment for California red-legged frog (CRLF, *Rana draytonii*) was performed independently of this general biological assessment by Dudek. The nearest documented occurrences of CRLF are located greater than 10 miles west-southwest and north-northeast of the project area. Potential CRLF habitat within the project area is limited to the two backwash/balancing basins and surrounding upland habitat located in the southwestern portion of the project area. Based on the location of the project area adjacent to the bay and relatively saline environments, the substantial distance of the project area to known CRLF occurrences in the region, the poor quality of the backwash/balancing basin habitats and surrounding upland habitat, and the manner in which the basins are operated as part of the recycled water operation, makes it highly unlikely that these basins are occupied by CRLF. Due to the dense nature of the cattails and blackberry in and adjacent to these ponds, visual encounter surveys would likely not result in detection even if the species was present. The habitats do not appear to provide suitable breeding or upland habitat for CRLF and as a result, it is highly unlikely the CRLF occur within these basins, the three seasonal wetlands, or within other aquatic habitats adjacent to the project area.

The three remaining animal species have moderate potential to occur within the Project area. These species include burrowing owl (*Athene cunicularia*), short eared owl (*Asio flammeus*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Suitable nesting and foraging habitat exists for both owl species on and adjacent to the Project area. Townsend's big-eared bat could potentially utilize the equipment and treatment plant infrastructure/facilities for roosting and the Project area for foraging (Appendix A).

All raptor species found in California are protected by California Fish and Game Code 3503.5. Four raptor species were observed on or flying over the Project area during the survey and several suitable nesting trees and/or cavities are present within the Project area. Although raptor species have the potential to nest and forage within the Project area and surrounding area, the Project area does not provide substantially important habitat, due to its small size and developed condition that would affect raptor species from continuing to occur in the area.

Based on the field reconnaissance surveys of the Project area, suitable habitat for special-status plant species does not appear to be present. The absence of appropriate habitat conditions and extent of prior development and ground disturbance likely precludes any special-status plant species from occurring within the Project area. However, due to the proximity of the treatment plant to San Francisco Bay and surrounding expanses of relatively undisturbed baylands, there is increased potential for special-status plants to occur, especially in portions of the Project area that have remained undeveloped (e.g., areas along the force main alignment). As such, Dudek recommends a focused survey for special-status plants be conducted during the appropriate blooming periods to ensure impacts to special-status plants do not result from project implementation, included as **MM Bio 1**.

No special-status animals were detected during the field reconnaissance survey. However, all native birds in California are protected by the federal Migratory Bird Treaty Act (MBTA) of 1918 and Section 3503.5 of the California Fish and Game Code, which specifically protects raptors. The Project area contains suitable nesting habitat for several common raptor species found in California, such as red-tailed hawk, and also common passerine species such as western meadowlark (*Sturnella neglecta*). Additionally, most of the construction activities within the Project area would be within areas that have been previously developed and disturbed, and would therefore not cause additional loss of important habitat.

Dudek recommends a nesting bird survey be completed by a qualified biologist two weeks prior to construction during the nesting season (February 1 - September 30) to determine if any native birds are nesting on or near the site (including a 300 foot buffer for raptors). If any active nests are observed during surveys, a suitable avoidance buffer from the nests will be determined and flagged by the qualified biologist based on species, location and planned construction activity. These nests would be avoided until the chicks have fledged and the nests are no longer active. Dudek also recommends removing any habitat (i.e. trees) outside of the bird nesting season, and with proper permits for tree removal from the County. A nesting bird survey will be included as **MM Bio 2**.

A focused bat survey is recommended to determine if any suitable roosting habitat is present in the Project area. The survey should take place not more than 30 days prior to the beginning of construction activities. Several species of bats are known to roost in the eaves of buildings, under peeling tree bark and tree cavities, and in other structures present on the Project area. Bats are protected by California Fish and Game code and any maternity roosts should be avoided until natal young have left the roost. The breeding period for bats typically occurs between April and August in California. Young are born in the spring and typically leave the maternity roost in late summer or early fall. Any active maternity roosts, if present, should be avoided until the breeding season is over. A focused bat survey will be included as **MM Bio 3**.

With adherence to **MM Bio 1, MM Bio 2,** and **MM Bio 3**, any potential impacts related to sensitive species as a result of Project implementation will be less than significant.

MM Bio 1:

> A pre-construction focused survey for soft salty bird's-beak and other rare and special-status plants will be conducted by a qualified botanist during the blooming period(s) of the target species. If a special-status species is observed, impacts should be avoided or minimized per the botanist's recommendation. If impacts are unavoidable, mitigation will be required in the form of: (1) methods of soil removal that ensure the existing layer of topsoil is not damaged or buried and is replaced as the top layer of soil after the force main is installed and backfilled; or (2) preservation and enhancement of lands supporting existing populations of the special-status species elsewhere, per the botanist's recommendation.

MM Bio 2:

A pre-construction nesting bird survey will be performed by a qualified biologist no earlier than two weeks prior to the initiation of construction activities. If any active nests are found, a suitable buffer will be determined by the biologist and the nest will be flagged and avoided until the eggs have hatched and the chicks have fledged.

MM Bio 3:

A pre-construction roosting bat survey will be completed to assess whether any active bat roosts are located within the Project area. These surveys would be performed in the early spring when maternity colonies are being formed. If no maternity colonies exist in the Project area, but day roosts are found, an exclusion plan would be developed in coordination with CDFW prior to initiation of construction.

Source: Bio Assessment prepared by Dudek, March 14, 2016

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?

Less than Significant Impact with Mitigation. Vegetation communities and land cover types present within the Project area were evaluated and delineated on a map during the field reconnaissance surveys prepared by Dudek. An aerial photograph (Google Earth 2015) with an overlay of the Project area boundary, and surrounding buffer was utilized to map the vegetation communities and record any special-status species observations or other sensitive biological resources while in the field (Figure 4).

Six land cover types were documented within the Project area (Figure 5). The majority of the Project area consists of developed/disturbed habitat including buildings, paved areas and gravel lots, ornamental landscaping, and upland areas that contain a mixture of weedy ruderal plant species and non-native annual grasses. No riparian habitat was identified during the biological survey. Annual grassland land cover type occurs in a small area between the eucalyptus (Eucalyptus spp.) grove to the west and Smith Ranch Road. The eucalyptus grove consists of approximately six eucalyptus trees that are interspersed among annual grassland habitat. A small area of oak woodland exists in the center of the Project area on the knoll to the west of the wastewater treatment facility. This area consists of annual grassland habitat oak trees (*Quercus* spp.), cottonwood (*Populus spp*.) and eucalyptus. Oak woodland and annual grassland land cover types are described in more detail below.

Annual Grassland. The annual grassland vegetation community mapped during the survey is dominated by a dense to sparse cover of annual, non-native grasses and forbs. Common species include brome grass, Italian ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*), orchard grass (*Dactylis glomerata*), barley, filarees (*Erodium* spp.), and others. However, native species are also often present in this grassland community, including bulbs, legumes, and some grasses, such as blue wildrye (*Elymus glaucus*). Ruderal species also occur in grasslands, especially along the margins of grasslands and in areas that have been historically disturbed. All of the grass species are dormant during the dry summer months.

Oak Woodland. Oak Woodland occurs in a narrow band on the knoll to the west of the wastewater treatment facility. This stand of approximately a dozen trees consists primarily of coast live oak (*Quercus agrifolia*), cottonwood (*Populus* spp.) and eucalyptus. The understory consists primarily of non-native annual grassland species including wild oats, ripgut brome (*Bromus diandrus*), wild radish (*Raphanus sativus*), and wild mustard (*Brassica* spp.).

Three, small, potentially jurisdictional seasonal wetland features are located along Smith Ranch Road within the alignment of the proposed force main replacement. These features are present along the southern side of Smith Ranch Road and appear to hold runoff from the adjacent hillside and drain to the open fields on the northern side of the road via a culvert that passes under the road (Figure 5). These three features appear to be independent of each other and exhibit evidence of wetland hydrology.

In addition to the aquatic features located along the Smith Ranch Road, two constructed backwash/balancing basins are also present on the eastern side of the Project area. These basins are dominated by freshwater emergent wetland vegetation, including cattail (Typha sp.); however, these are man-made features and function as part of the treatment plant's recycled water operation. The hydrology of these basins is artificial and is a function of the water that is piped into and out of these basins during the recycled water treatment process. Other inputs are limited to direct precipitation and a very limited amount of overland flow as the area surrounding these features has been highly modified.

Impacts from the proposed project would occur mostly to the developed portions of the Project area, and therefore would not cause additional loss of important habitat to any listed species. Minimal temporary impacts to habitat along Smith Ranch Road would occur due to installation of the force main, but no permanent loss of important habitat for special-status species would occur due to development in this portion of the Project area, per **MM Bio 1**. Although no significant impacts have been identified to any protected or special habitat type by the project, in order to reduce impacts to currently undisturbed vegetation communities within the Project area are minimized **MM Bio 4** would be implemented, and all previously undeveloped areas that are disturbed by construction activities would be returned to pre-project grades and contours to the maximum extent practicable. Any exposed soils would be stabilized, protected from erosion from wind and water and seeded with an appropriate native/naturalized seed mix. With implementation of **MM Bio 4**, any potential impacts to sensitive natural communities will be less than significant.

MM Bio 4:

To minimize impacts on vegetation communities from project construction activities, all previously undeveloped areas including annual grassland, annual grassland disturbed, and eucalyptus grove that are disturbed by construction activities should be returned to pre-project grades and contours to the maximum extent practicable. Any exposed soils should be stabilized, protected from wind and water erosion and seeded with an appropriate native/naturalized seed mix.

Source: Bio Assessment prepared by Dudek, March 14, 2016, Bio Assessment – Appendix D

Source: Dudek, 2016.

Figure 5 - Potentially Jurisdictional Features and Vegetation Communities

Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

ALBERT A. WEBB ASSOCIATES

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c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than Significant Impact with Mitigation. According to the Biological Resources Assessment conducted by Dudek, several locations within the Project area were identified as potentially jurisdictional wetlands. Three, small, potentially jurisdictional seasonal wetland features are located along Smith Ranch Road within the alignment of the proposed force main replacement. These features are present along the southern side of Smith Ranch Road and appear to hold runoff from the adjacent hillside and drain to the open fields on the northern side of the road via a culvert that passes under the road (Figure 5). These three features appear to be independent of each other and exhibit evidence of wetland hydrology.

In addition to the aquatic features located along the Smith Ranch Road, two constructed backwash/balancing basins are also present on the eastern side of the Project area. These basins are dominated by freshwater emergent wetland vegetation, including cattail (Typha sp.); however, these are man-made features and function as part of the treatment plant's recycled water operation. The hydrology of these basins is artificial and is a function of the water that is piped into and out of these basins during the recycled water treatment process. Other inputs are limited to direct precipitation and a very limited amount of overland flow as the area surrounding these features has been highly modified.

The three small aquatic features may be considered jurisdictional by the regulatory agencies (i.e., U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and/or California Department of Fish and Wildlife (CDFW)). A formal delineation of waters of the United States/State is recommended to determine if these features are jurisdictional wetlands and would be subject to regulation by one or more of these agencies. If these features are determined to be jurisdictional, and cannot be avoided by project construction activities, then a permit(s) from one or more of the regulatory agencies would be triggered and compensation for unavoidable impacts in the form of wetland creation, restoration and/or enhancement of aquatic resources similar to those impacted would likely be required. Such regulatory permits would likely include specific requirements to protect wildlife resources during project implementation, such as seasonal work restrictions, pre-construction surveys for nesting birds, erosion control measures and/or installation of wildlife exclusion fencing.

Since there is the potential to affect federally protected wetlands, **MM Bio 5** will be implemented. Upon completion of the formal jurisdictional delineation of the three small aquatic features, impacts to federally protected wetlands will be evaluated and any potential permits will be obtained prior to construction. With **MM Bio 5** incorporated, impacts will be less than significant.

MM Bio 5:

Since three potentially jurisdictional features and two constructed basins with wetland characteristics were observed in the Project area during the field reconnaissance survey, a formal delineation of waters of the United States/State will be completed to determine the jurisdictional status of these features and whether project impacts to these features will trigger the need for permits from USACE, RWQCB and/or CDFW. If these features are determined to be jurisdictional, and cannot be avoided by project construction activities, then a permit(s) from one or more of the aforementioned regulatory agencies would be triggered and compensation for unavoidable impacts in the form of wetland creation, restoration and/or enhancement of aquatic resources similar to those impacted will be implemented.

Source: Bio Assessment prepared by Dudek, March 14, 2016

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?

Less than Significant. Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal.

Because the Project area occurs within an area that has been subject to disturbance and modified by human activities, the Project area has limited value as a potential wildlife corridor or habitat linkage. However, the surrounding lands could potentially be used as a local wildlife corridor by common wildlife species such as raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginianus*) and coyote (*Canis latrans*). Wintering waterfowl and other migratory birds were observed using the area to the north of the Project area as a stopover for feeding and resting. All native migratory birds in California are protected by the federal Migratory Bird Treaty Act and this area could be utilized as a foraging and resting habitat linkage during migration periods.

Since the proposed Project area has limited value as a potential wildlife corridor or habitat linkage, and migratory birds are protected by federal regulations, any potential impacts to the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors will be less than significant.

Source: Bio Assessment prepared by Dudek, March 14, 2016

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less than Significant. The City does not have a Tree Preservation Ordinance; however, County Native Tree Preservation and Protection Ordinance #3291 is in place to protect large trees, trees with historical importance, oak woodland habitat, and prevent the untimely removal of trees. A Tree Removal Permit from the County of Marin is required for the removal of trees in the following instances:

- More than two (2) "Protected Trees" are being removed from a developed lot in a 12-month period;
- The tree qualifies as a "Heritage Tree";
- The tree is a "Protected Tree" or "Heritage Tree" and is located in a Stream Conservation Area or a Wetland Conservation Area;
- Any removal of "Protected Trees" on a vacant lot; and,
- The trees proposed for removal do not qualify for an exemption under Section 22.62.040 of the Marin County Code.

If any trees need to be removed to facilitate Project implementation, a report from a licensed arborist will be obtained to verify the status of the trees and document the applicability of Ordinance #3291. If necessary, tree removal would occur outside of the bird nesting season (the non-nesting season extends from October 1-January 31). With adherence to the County Native Tree Preservation and Protection Ordinance, any impacts related to conflicts with local policies or ordinances protecting biological resources will be less than significant.

Source: Bio Assessment prepared by Dudek, March 14, 2016, GP 2020 FEIR Appendix VIII.1 – Initial Study, Marin CWP

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?

No Impact. Currently, no approved local, regional, or state habitat or natural community conservation plans exist that include any portion of the City or the County. Therefore, the proposed Project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. No impacts will occur in this regard.

Source: Bio Assessment prepared by Dudek March 14, 2016, GP 2020 FEIR Appendix VIII.1 – Initial Study, Marin CWP FEIR

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
V. CULTURAL RESOURCES. Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b. Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Cultural Resource Discussion:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

Less than Significant Impact. A resource less than fifty years old may be considered for listing in the California Register of Historical Resources (CRHR) if it can be demonstrated that sufficient time has passed to understand its historical importance (see Cal. Code Regs., tit. 14, section 4852(d)(2)). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the National Register of Historic Places (NRHP).

A cultural resource investigation of the proposed Project consisted of a records search of the project area and a 0.5 mile radius around the project area at the NWIC, a search of the Sacred Lands File at the NAHC, and an intensive pedestrian survey of the project area. A records search was requested by Dudek archaeologist Scott Wolf on January 1, 2016 at the NWIC and responded to by the NWIC on January 22, 2016. The records search included examination of historic resource location maps, historic maps, and a review of previous studies performed in the area.

The records search identified one previously known cultural resource within the project area, the Las Gallinas Wastewater Treatment Plant itself (P-21-002672). The plant was erected 1954 indicating it is historic in age. However, the plant has undergone many renovations since its original construction and possesses no historically unique characteristics. Based on these observations, the plant was determined ineligible for the NRHP or CRHR in 2009.

One previously known cultural resource was also identified within 0.5 mile of the project area. Railroad tracks for the Northwestern Pacific Railroad (P-21-002618) are adjacent to the force main replacement portion of the APE, directly to the west. The present alignment for the tracks was set in 1912-1913. The current tracks were upgraded in 1970s. Numerous other upgrades have substantially compromised the integrity of this resource as a whole and it was recommended to be ineligible for the NRHP and CRHR listing in 2008.

Since the Las Gallinas Valley Wastewater Treatment Plant was determined to be ineligible for NRHP or CRHR listing, impacts related to modifications to the WWTP would be less than significant.

Source: Cultural Resources Report prepared by Dudek March 10, 2016

b) Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?

Archaeological Resources
Less than Significant Impact with Mitigation. An intensive pedestrian survey was performed by Dudek on January 21, 2016 on foot to look for surface artifacts, undisturbed areas, or historic structures. Subsurface exposures and rodent burrows were opportunistically inspected for indications of soils with the potential to contain archaeological deposits.

A series of overview photographs were taken to document the current condition and previous disturbances to the section as well as to document the existing structures on the site.

The majority of areas throughout the site were noted to have been subject to substantial disturbances related to construction of the wastewater treatment plant. This construction appears to have included cut-and-fill, trenching, pad preparation, and general grading activities. Office buildings, maintenance garages, and other facility structures are present in the western portion of the site, and much of the remaining area is devoted to clarifying pools, parking areas, and landscaping. It appears that limited intact subsurface native soils remain.

The alignment of the proposed force main upgrade extends from the southwest entrance of the treatment plant and follows Smith Ranch Road south for approximately 1,400 feet. The road here has been cut out of the hillside, stabilized, and paved over. The alignment then extends west to the train tracks and turns south and follows the eastern side of the train tracks under a bed of fill to the southern boundary of the project area. All areas along the alignment of the force main replacement show high levels of ground disturbance. No artifacts or cultural resources were encountered during the pedestrian survey.

The Cultural Resources Report prepared for the proposed Project by Dudek included a records search and intensive field survey of the Project site, the results of which did not reveal the presence of any previously recorded or potential archaeological resources. Further, the site has been previously disturbed and it is highly unlikely that any archaeological resources could exist. However, in order to provide protection in the unlikely event that archaeological resources are unearthed during Project construction, implementation of mitigation measure **MM CR 1** will reduce potential impacts to less than significant with mitigation.

> **MM CR 1**: In the event cultural resources are inadvertently found by onsite personnel during construction, all ground disturbing activities should stop and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology should be retained to evaluate the discovered resources and recommend appropriate action.

<u>Tribal Resources</u>

Less than Significant Impact with Mitigation. Assembly Bill 52 (AB 52), signed into law in 2014, amends CEQA and establishes new requirements for tribal notification and consultation. AB 52 applies to all projects for which a notice of preparation or notice of intent to adopt a negative declaration/mitigated negative declaration is issued after July 1, 2015. AB 52 also broadly defines a new resource category of tribal cultural resources and establishes a more robust process for meaningful consultation that includes:

- Prescribed notification and response timelines;
- Consultation on alternatives, resource identification, significance determinations, impact evaluation, and mitigation measures; and
- Documentation of all consultation efforts to support CEQA findings.

A Sacred Lands File search request was requested from the NAHC on January 20, 2016 by Dudek archaeologist Scott Wolf. The NAHC's response on February 18, 2016 failed to identify any Native American cultural resources within the project area. The NAHC also provided a Contact List of Native American representatives that may have additional information relating to cultural resources in the vicinity. Letters containing a brief project description and location were sent on March 1, 2016 to these individuals with a request for any additional information that might be provided. No responses to these outreach attempts have been received from tribal representatives to date.

Additionally, no tribes have contacted the District pursuant to AB52 for consultation on projects. Therefore, AB52 does not apply to this project.

The Cultural Resources Report prepared for the proposed Project by Dudek included a records search and intensive pedestrian survey of the Project site, the results of which did not reveal the presence of any previously recorded or potential tribal resources. Further, the site has been previously disturbed and it is highly unlikely that any tribal resources could exist. According to the Cultural Resources Report, no cultural monitoring appears to be necessary. However, in order to provide protection in the unlikely event that cultural resources are unearthed during Project construction, implementation of mitigation measure **MM CR 1** will reduce potential impacts to less than significant with mitigation.

Source: Cultural Resources Report prepared by Dudek March 10, 2016

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant Impact with Mitigation. As discussed in b), a records search was requested by Dudek archaeologist Scott Wolf on January 1, 2016 at the NWIC and responded to by the NWIC on January 22, 2016. No prehistoric resources have been identified in the project area or surrounding records search area. However, given that the Project site has been previously disturbed, discovery of any unique paleontological resource is considered highly unlikely. Nonetheless, to ensure impacts to paleontological resources at the Project site are less than significant in the event of accidental discovery, the Project will incorporate **MM CR 2** which will reduce potential impacts to less than significant with mitigation.

> **MM CR 2:** In the event paleontological resources are inadvertently found by onsite personnel during construction, all ground disturbing activities should stop and a qualified paleontologist should be retained to evaluate the discovered resources and recommend appropriate action in accordance with the standards and guidelines of the Society of Vertebrate Paleontology.

Source: Cultural Resources Report prepared by Dudek March 10, 2016

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less than Significant Impact. There are no known human remains or cemeteries on the site and, because of the minimal ground disturbance in recently deposited sediment, none are likely to be encountered in project implementation.

PRC Section 5097.98 outlines the process to be followed in the event that human remains are discovered. If human remains of prehistoric origin are discovered, California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains can occur until the County Coroner has examined the remains (Section 7050.5b). Therefore, with adherence to existing laws and codes, impacts will be less than significant.

Source: Cultural Resources Report prepared by Dudek March 10, 2016

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VI. GEOLOGY AND SOILS. Would the project:				
a. Expose people or structures to 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 or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐

Environmental Factors:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides or mudflows?	☐	☐	☒	☐
b. Result in substantial changes in topography, unstable soil conditions from excavation, grading or fill, or 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 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Geology and Soils Discussion:

a) Expose people or structures to 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 or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less than Significant Impact. There are no Alquist-Priolo Earthquake Fault Zones within the proposed Project site and the Project site is not near any known active faults. The nearest known active fault traces are the San Andreas fault, approximately 8 miles to the southwest of the City, and the Hayward fault, approximately 8 miles to the northeast. Therefore, the potential for fault surface rupture within the Project site is low and potential impacts are less than significant.

Source: GP 2020 Exhibit 28 – Active Regional Faults, GP 2020 FEIR, Marin CWP Map 2-10 – Fault Hazards

ii) Strong seismic ground shaking?

Less than Significant Impact. The San Rafael Planning Area is located within a seismically active area and will therefore experience the effects of future earthquakes. Within the San Francisco Bay Area, faults are concentrated along the San Andreas Fault zone. There are no known active faults within the Planning Area and compared to other cities in the Bay Area, the estimated historic earthquake accelerations experienced in the Planning Area are relatively low. This is due to the fact that San Rafael is situated an equal distance between the major faults and the epicenters of the historic earthquakes have been a fair distance from the project area..

The proposed Project involves upgrades to the existing LGVSD WWTP that will be in compliance with the Uniform Building Code (UBC), which provides for stringent earthquake resistant design parameters for areas subject to seismic ground shaking. With adherence to the UBC, potential impacts from strong seismic ground shaking will be less than significant.

Source: GP 2020 FEIR

iii) Seismic-related ground failure, including liquefaction?

Less than Significant Impact. Liquefaction is the transformation of loose, wet soil from a solid to a liquid state often as a result of strong ground shaking during an earthquake. According to the Marin CWP, the proposed Project site has a High and Very High Level of Liquefaction susceptibility. On the basis of the liquefaction failures that occurred during past earthquakes, it is expected that at least 80 percent of future liquefaction failures will take place in areas judged to have High or Very High susceptibilities.

The WWTP upgrades will be designed to meet UBC parameters to protect features from liquefaction. With adherence to the UBC, potential impacts from seismic-related ground failure, including liquefaction will be less than significant.

Source: GP 2020 FEIR; Marin CWP Map 2-11 – Liquefaction Susceptibility Hazards

iv) Landslides or mudflows?

Less than Significant Impact. Landslides and mudflows involve the downslope movement of soil, rocks, water, and debris, which typically occurs during an earthquake or after heavy rain fall. There are no slopes within the proposed Project area where landslides or mudflows could occur; therefore impacts would be less than significant.

Source: GP 2020 FEIR

b) Result in substantial changes in topography, unstable soil conditions from excavation, grading or fill, or soil erosion or the loss of topsoil?

Less than Significant Impact. The proposed Project is located within the existing LGVSD WWTP and will not involve substantial changes in topography. Construction activities may lead to soil erosion or the loss of topsoil, however, implementation of a Stormwater Pollution Prevention Plan (SWPPP) would reduce these potential impacts to a less than significant level.

Source: GP 2020 FEIR

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?

Less than Significant Impact. Impacts related to landslides are addressed above in response to 6a.iv; impacts related to liquefaction are addressed above in response to 6a.iii. This analysis addresses impacts related to unstable soils, as a result of lateral spreading, subsidence, or collapse:

Lateral Spreading: Lateral spreading is a situation in which a subsurface layer of soil liquefies and allows the upper soil mass to deform laterally toward a free face, such as a stream.

Subsidence: Seismic ground subsidence (not related to liquefaction induced settlements) occurs when strong earthquake shaking results in the densification of loose to medium density sandy soils above groundwater. Ground subsidence can occur from the consolidation of the compressible bay mud that underlies the eastern portion of the City Planning Area. Consolidation of the bay mud can result in significant settlement of the ground surface. Previous fill placed to develop the marsh areas is currently causing ongoing consolidation and settlement of the ground surface. Any new fill or structure loads will induce new settlement in addition to any on-going settlement.

Collapse: A collapsible soil will undergo a reduction in volume upon wetting. Collapsible soils will typically have a low dry density and low moisture content. Collapsible soils may support large pressures with low compressibility when dry but experience significant compression upon wetting without an increase in pressure.

Prior to construction of proposed Project, site specific Geotechnical Investigations will be prepared to assess the geology and soils present and any hazards associated with the site conditions. Compliance with recommendations from the site project specific Geotechnical Investigation will reduce hazards associated with unstable soils to a less than significant impact.

Source: GP 2020 FEIR

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less than Significant Impact. Table 18-1-B of the Uniform Building Code ("Classification of Expansive Soil") states the potential expansion as a function of the expansion index of the soil (an Expansion Index of 1-20 has a Very Low potential expansion, 21-50 has Low, 51-90 has Medium, 91-130 has High, and above 130 has Very High potential expansion). According to the GP 2020 FEIR, expansive soils are not widely present in the City of San Rafael, but they can exist locally. A geotechnical investigation would reduce expansive soils impacts by identifying, characterizing and developing recommendations to mitigate expansive soils hazards. In addition, prior to issuance of a grading permit, the County also requires a Geotechnical report that would identify hazards associated with expansive soils.

Prior to construction of proposed Project, site specific Geotechnical Investigations will be prepared to assess the geology and soils present and any hazards associated with the site conditions. Compliance with recommendations from the site project specific Geotechnical Investigation will reduce hazards associated with expansive soils to a less than significant impact.

Source: GP 2020 FEIR; Marin CWP FEIR; UBC

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The proposed Project will be served by the sewer system at the existing LGVSD WWTP facility and no septic tanks or alternative wastewater disposal systems would be required. Therefore, there will be no impacts in terms of having soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems.

Source: Project Description

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VII. GREENHOUSE GAS EMISSIONS. Would the project:				
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 gases?	☐	☐	☒	☐

Greenhouse Gas Emissions Discussion:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant Impact. Greenhouse gases – primarily carbon dioxide, methane, and nitrous oxide collectively reported as carbon dioxide equivalents (CO2e) – are directly emitted as a result of stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as onroad vehicles and offroad construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (CARB 2008).

No GHG thresholds apply to construction activities. As shown in Table 7.1 below, the proposed Project would cause to be emitted about 870 MT of CO2e during construction. The BAAQMD industrial facility GHG threshold of 10,000 metric tonnes (MT) per year would apply to the proposed Project with respect to the net operational change. If the net change in ROG emissions of 79 pounds per year is treated as methane (CH4), which has a Global Warming Potential (GWP) of 25 (EPA 2016), then the apparent net change attributable to WWTP processes would be less than one metric ton per year of CO2e, which is less than significant (BAAQMD 2011, 2010b).

Direct onsite and offsite GHG emissions were estimated for construction of the proposed Project. Ongoing operation of the upgraded POTW would result in approximately the same – or just slightly greater – level of direct and indirect GHG emissions as the existing facility, therefore, there would be no substantial net impacts from Project operation, hence, less than significant. However, as applicable to new construction, the proposed Project would be required to comply with Title 24 energy conservation mandates. The aggregate GHG impact of construction and operation of the proposed Project would be less than significant.

7.1 CalEEMod Model Results Estimated GHG Emissions Summary – Construction		
Greenhouse Gases	Maximum lbs/day	Total MT
Biogenic CO_2	0.0	0.00
Non-Biogenic CO_2	3,044	867
Total CO_2	3,044	867
CH_4	0.8	0.16
N_2O	0.0	0.00
CO_2e	3,060	870

Source: Table 3-11, AQ/GHG Analysis

Source: AQ/GHG Analysis prepared by Yorke, March 2016

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact. California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2013 standards improved upon the 2008 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2013 standards went into effect on July 1, 2014. The 2016 standards currently in draft form (released June 2015) will further improve upon the 2013 standards for all types of buildings. The final 2016 standards will go into effect on January 1, 2017 (CEC 2016).

Since the Title 24 standards require energy conservation features in new construction (e.g., high-efficiency electric motors, high-efficiency lighting, high-efficiency heating, ventilating, and air-conditioning (HVAC) systems, thermal insulation, double-glazed windows, water conserving plumbing fixtures, etc.), they indirectly regulate and reduce GHG emissions. The new construcition on the site will comply with Title 24. Therefore, the Project will not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases and the impact would be less than significant.

Source: AQ/GHG Analysis prepared by Yorke, March 2016

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
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 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 for people residing or working in the project area?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed?	☐	☐	☒	☐

Hazards and Hazardous Materials Discussion:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant Impact. Construction and operation of the proposed Project may include the transportation and storage of hazardous materials, such as fuels, paints, cleaning solvents. The transportation of hazardous materials can result in accidental spills, leaks, toxic releases, fire, or explosion. The project is not expected to create the need for an excess of hazardous materials being used on site either for construction or operation of the treatment plant upgrades.

Anumber of federal and state agencies prescribe strict regulations for the safe transportation of hazardous materials. Hazardous material transport, storage and response to upsets or accidents are primarily subject to federal regulation by the United States Department of Transportation (DOT) Office of Hazardous Materials Safety in accordance with Title 49 of the Code of Federal Regulations. California regulations applicable to Hazardous material transport, storage and response to upsets or accidents are codified in Title 13 (Motor Vehicles), Title 8 (Cal/OSHA), Title 22 (Management of Hazardous Waste), Title 26 (Toxics) of the California Code of Regulations, Chapter 6.95 of the Health and Safety Code (Hazardous Materials Release Response Plans and Inventory) and the California Building Code.

The NPDES permit (no. CA0037851) for LGVSD WWTP includes policies, guidelines, and plans to address wastewater discharge and any potential wastewater contamination from hazardous materials. The National Toxics Rule (NTR) and California Toxics Rule (CTR) contain water quality criteria for priority pollutants. The NPDES permit also includes provisions so that all waters are maintained free of toxic substances in concentrations that are lethal or that produce other detrimental responses in aquatic organisms.

Compliance with all applicable federal and state laws related to the transportation, use, storage and response to upsets or accidents that may involve hazardous materials would reduce the likelihood and severity of upsets and accidents during transit and storage. Additionally, the project is not expected to result in the use of large amounts of hazardous materials that would create a risky situation. Therefore, potential impacts are considered less than significant.

Source: CCR, Title 49 of the Code of Federal Regulations, CBC, NPDES no. CA0037851

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than Significant Impact. As noted in response 8a above, the Project may involve the use of hazardous materials but shall comply with all applicable federal and state laws pertaining to the transport, use, disposal, handling, and storage of hazardous materials, including but not limited to Title 49 of the Code of Federal Regulations and Title 13, (motor vehicles) Title 8 (Cal/OSHA), Title 22 (Health and Safety Code), Title 26 (Toxics) of the California Code of Regulations, Chapter 6.95 of the Health and Safety Code (Hazardous Materials Release Response Plans and Inventory) and the California Building Code, which describes strict regulations for the safe transportation of hazardous materials. Compliance with all applicable federal and state laws related to the transportation, use and storage of hazardous materials would reduce the likelihood and severity of accidents during transit, use and storage to a less than significant impact.

Source: California Health and Safety Code, CCR, Title 49 of the Code of Federal Regulations, CBC

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. The proposed Project site is not located within one-quarter mile of an existing or proposed school. The closest schools are the GATE Academy and Timothy Murphy School located at 1 St Vincents Drive in San Rafael, approximately 0.65 miles north of the Project site. Therefore, there will be no impacts in terms of emitting hazardous emissions or handling hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Source: Google Earth

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?

Less than Significant Impact. Per a review of the California Department of Toxic Substances Control (DTSC) EnviroStor Database, the proposed Project site is located on the former San Francisco Nike Battery 93 site (J09CCA0944), a Military Evaluation Cleanup Site. Between the years of 1956 and 1970, the Army accumulated 71.67 acres through purchases, donations, leases, and condemnations. Nike 39 is a Formerly Used Defense Site (FUDS) that served as an assembly, launch and control facility for defense against hostile aircraft. The site was declared excess to General Services Administration (GSA) on November 8, 1971, and the property was quitclaimed to the City of San Rafael for park and recreation purposes. Among the improvements to this facility were four Underground Storage Tanks (USTs) located in the Facility Area. No evidence of hazardous wastes, toxic substances, or unexploded ordnance was observed. Similarly, no evidence of contamination was detected at either the Launcher or IFC areas.

A site map provided by USACE does indicate the presence of a 4,000 gallon UST near the launchers. No evidence was observed as to whether the tank still exists, though the fill and vent pipes may be buried. The cleanup status of the site is open but eligible for closure as of September 1, 2013. The site was also referred to the RWQCB as of July 22, 2014. Given that the site is eligible for closure and no evidence of contamination, hazardous wastes, toxic substances, or unexploded ordnance was observed, and since the site is an already operating WWTP, the proposed Project would not create a significant hazard to the public or the environment and potential impacts are less than significant.

Source: DTSC EnviroStor, USACE CorpsMap

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 for people residing or working in the project area?

No Impact. The proposed Project is not located within an airport land use plan or within 2 miles of a public use airport and as such will have no impact on exposing people residing or working in the Project area to safety hazards in that regard.

Source: GP 2020 FEIR Exhibit IV.4-2 Existing Airport Noise Contours

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Less than Significant Impact. The San Rafael Airport is approximately 0.34 miles from the existing LGVSD WWTP and proposed Project site. The San Rafael Airport is privately owned and is limited to based-aircraft only. Commercial flight activity, flight training and use by helicopters are prohibited. All development in the vicinity of the San Rafael Airport are required to adhere to the provisions of the *Airport Land Use Planning Handbook*, published by Caltrans' Division of Aeronautics which includes safety standards, as well as the policies of the City's general plans. Therefore, any potential impacts will be less than significant.

Source: GP 2020 Exhibit 32 – San Rafael Airport Noise Contours, GP 2020 FEIR Exhibit IV.4-2 Existing Airport Noise Contours

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The City has adopted an Emergency Response Plan in cooperation with other public agencies that provides procedures to be followed in terms of fire, flood, and earthquake response. Since the proposed Project involves updates to an existing WWTP, there will be no impact in terms of impairing implementation or physically interfering with an adopted emergency response plan or emergency evacuation plan.

Source: OES Strategic Plan 2-Year Progress Report

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed?

Less than Significant Impact. The proposed Project is located within the current WWTP area and the property is not located within a Very High Fire Severity Zone (VHFSZ). The Project site is also not located where wildlands are adjacent to urbanized areas or where residences are intermixed. Therefore, any impact regarding exposure or structures to a significant risk of loss, injury or death involving wildland fires will be less than significant.

Source: CAL FIRE - Marin County Very High Fire Hazard Severity Zones in LRA

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
IX. HYDROLOGY AND WATER QUALITY. Would the project:				
a. Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of a watercourse or wetland, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?	☐	☐	☒	☐
e. 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?	☐	☐	☒	☐
f. Otherwise substantially degrade water quality?	☐	☐	☒	☐
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☒	☐
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j. Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Hydrology and Water Quality Discussion:

a) Violate any water quality standards or waste discharge requirements?

Less than Significant Impact. Construction and operation of the proposed Project has the potential to release pollutants that could impact downstream water quality. The Water Quality Standards that could be impaired by the Project are the sum of the Water Quality Objectives (numeric and narrative) and Designated Beneficial Uses (e.g., human contact recreation, fish spawning, etc.) of the receiving waters. The site is tributary to Miller Creek which outlets into San Pablo Bay. Both waterbodies have Water Quality Standards described in the San Francisco Bay Basin Plan enforced by the San Francisco Bay Regional Water Quality Control Board (RWQCB). The RWQCB and the State Water Resources Control Board (SWRCB) issue and enforce Waste Discharge Requirements (aka WDRs or permits) that allow for construction and discharge from various land uses, including wastewater treatment plants, while maintaining downstream Water Quality Standards.

Currently, the LGVSD wastewater treatment plant discharges ‘blended’ effluent (primary-treated effluent combined with secondary/tertiary-treated effluent) as needed during wet-weather events that exceed the capacity of the plant. The primary goal of the Project is to add secondary clarifiers to double the capacity and stop the need for discharging ‘blended’ effluent into Miller Creek and the Bay. In addition, the Project proposes to improve effluent quality by adding an activated sludge process. Lastly, the proposed Project includes raising the elevations of the secondary treatment and clarification processes in consideration of the following factors: (1) rising sea levels, and (2) high tides and water levels during storm events. This is aimed at stopping discharges from the chlorine contact basin into Miller Creek.

The existing drainage pattern routes onsite storm water collected via gutters and catch basins into the headworks of the LGVSD wastewater treatment plant. The stormwater is comingled with the wastewater, treated and discharged as part of the plants’ secondary-treated municipal effluent. The effluent is discharged at two locations in Miller Creek and regulated by the plant’s WDR permit to protect downstream Water Quality Standards (Tentative Order No. R2-2015-XXXX, NPDES No. CA0037851). The plant is also subject to compliance with the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems that details operation and maintenance, reporting and mitigation requirements (“General Colllection System WDRs,” SWRCB Order No. 2006-0003-DWQ). The pollutant of concern for Miller Creek is diazinon, an organophosphate insecticide commonly found in urban runoff. The RWQCB Basin Plan includes a TMDL for diazinon and pesticide-related toxicity in urban creeks, including Miller Creek. The TMDL does not apply to the LGVSD wastewater treatment plant because the plant does not discharge urban runoff.

During construction of the proposed Project, there is potential for on-site and off-site erosion (from wind and water), as well as non-storm water discharges (e.g., construction materials and leaking machinery). To mitigate construction-phase discharges, the project is required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP) pursuant to Statewide Construction General Permit No. 2009-0009-DWQ (NPDES No. CAS000002). Temporary erosion and sediment control BMPs would be designed by a Qualified SWPPP Developer and applied under the supervision of a Qualified SWPPP Practitioner to minimize the potential for construction-related pollutants to the maximum extent practicable.

Furthermore, one of the first tasks of Project construction is relocation of the main road to the eastern perimeter and raising its elevation to act as a barrier between the Project site and the tidal effects of San Pablo Bay.

After construction is complete, onsite storm water will continue to be routed to the plant headworks for treatment. Because the facility is a Publicly-Owned Treatment Works (POTW), it is exempt from the post-construction stormwater best management practice (BMP) requirements found in the Marin County MS4 (Multiple Separate Storm Sewer System) permit (Order No. 2013-0001-DWQ, NPDES No. CAS000004)

All stormwater within the plant boundaries, excluding the reclamation area, is directed to the plant headworks; therefore, coverage under the statewide permit for discharges of stormwater associated with industrial activities is not required (NPDES General Permit No. CAS000001).

With compliance of existing regulations for implementing effective construction-phase erosion and sediment control BMPs, improvement of plant effluent by the proposed Project, and continuing adherence to the plant’s discharge permit, impacts of the Project to water quality standards and waste discharge requirements are expected to be less than significant.

Source: Project Description; Basin Plan; NPDES, MS4 Permit

b) ***Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?***

Less than Significant Impact. The project site is located within the Novato Valley Groundwater Basin. Approximately 2,000 square feet of porous pavement in the form of curb, gutter, and sidewalk was recently installed onsite as part of a clarifier project. As described in response (a) above, the proposed Project does not include a component that would significantly deplete or interfere with groundwater supplies or recharge. Even with a small increase in the impervious area of the plant, the marsh ponds and two storage ponds will be unchanged and the water they hold will continue to be utilized for recycled water purposes. Therefore, impacts are considered less than significant.

Source: Marin CWP FEIR Exhibit 4.5-2 – St. Vincent's/Silveira Properties – Hydrologic Setting; Personal communication, Justin Logan, AQUA Engineering, 1/12/16.

c) ***Substantially alter the existing drainage pattern of the site or area, including through the alteration of a watercourse or wetland, in a manner which would result in substantial erosion or siltation on- or off-site?***

Less than Significant Impact. The Project site is generally flat and will be altered during Project construction to prevent future high water levels and tidal impacts from Miller Creek and San Pablo Bay. This includes moving the access road to the eastern perimeter to act as a barrier. However, onsite runoff will continue to be funneled to the plant headworks for treatment. No watercourses or wetlands will be impacted as part of the Project. Complying with the General Stormwater Construction Permit will ensure an effective SWPPP to minimize erosion and sedimentation to the maximum extent practicable; therefore, impacts are considered less than significant.

Source: Project Description

d) ***Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?***

Less than Significant Impact. The proposed Project will change the site layout by the addition of various plant components, but the drainage pattern will continue to funnel onsite flows into the plant headworks for treatment. The Project will not alter the course of any stream or river. The site will remain relatively flat and is not expected to substantially increase the rate or amount of runoff. The proposed Project is, in fact, aimed at reducing unnecessary discharges during wet-weather events by increasing treatment capacity. Therefore, on-site or off-site flooding is considered less than significant.

Source: Project Description

e) ***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?***

Less than Significant Impact. One of the goals of the proposed Project, as listed in the plant's NPDES effluent permit renewal, is to reduce the amount of stormwater draining into the plant which subsequently goes partially untreated because it occurs during a storm event and the plant is exceeding capacity. Although the Project will increase the impervious area of the plant, the plant's treatment volume will double from roughly 9 million gallons per day (MGD) to 18 MGD; therefore eliminating future events of wet-weather discharges of blended effluent. Onsite stormwater drainage systems are not expected to operate above capacity and additional sources of polluted runoff are not anticipated with incorporation of existing regulations for construction and operation-phase activities. Therefore, impacts are considered less than significant.

Source: Project Description

f) Otherwise substantially degrade water quality?

Less than Significant Impact. Project construction has the potential to result in discharges of polluted runoff that would impact water quality. Potential and expected pollutants include metals, nutrients, sediment, trash/debris, and oil/grease. Sources of these pollutants include various types of earthmoving equipment, and exposed soil. However, water quality impacts related to construction of the proposed Project are mitigated by the established regulatory mechanisms which govern the construction phase of the Project.

During construction, the Project is required to comply with NPDES requirements, as discussed in (a) above. Preparation of a project-specific SWPPP, in accordance with the NPDES Statewide General Construction Permit, is required to minimize discharges to the maximum extent practicable. The SWPPP identifies methods of erosion control, sediment control, wind erosion control, waste management, and BMPs for non-storm water discharges. Thus, through regulatory compliance, impacts to water quality during construction are less than significant.

At completion, the plant will produce improved effluent, additional capacity, and overall enhanced capabilities particularly during storm events that are aligned with the plant's NPDES discharge permit. Therefore, impacts to water quality are less than significant.

Source: Project Description

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Less than Significant Impact. The property currently does not have housing and likewise, the proposed Project would not include construction of any housing. Impacts are considered less than significant.

Source: Project Description

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less than Significant Impact. The LGVSD wastewater treatment plant property is not within the 100-year flood hazard area (FEMA Panel No. 006097C110G); however, it is bordered on three sides by land that is within the 100-year flood hazard area (FEMA Panel No. 06041C0294D). Two driving factors for the Project are to prepare the plant for rising sea levels and alleviate impacts from high tides particularly during storm events. This includes raising the elevation and relocating the main road to the perimeter. With these elements incorporated, the existing and proposed structures on the property would not impede or redirect flood flows, and impacts are considered less than significant.

Source: FEMA, GP 2020 – Exhibit 29 Flood Hazard Areas

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less than Significant Impact. Most of the proposed Project area is within the 500-year flood zone (FEMA Panel No. 06097C1100G; 0.2% chance of occurrence) and would not be affected by the failure of a levee or dam. Therefore, any potential impacts are considered less than significant.

Source: FEMA

j) Inundation by seiche, tsunami or mudflow?

Less than Significant Impact. According to the Marin County Countywide Plan, a seiche and tsunami could occur in San Pablo Bay; however, tsunami inundation maps do not include the Marin County coast. Exposure would vary locally, depending on many factors involved. Implementation of the proposed Project would have no effect on this condition, therefore impacts are considered less than significant.

Source: Marin CWP

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
X. LAND USE PLANNING. Would the project:				
a. Physically divide an established community?	☐	☐	☐	☒
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Land Use and Planning Discussion:

a) Physically divide an established community?

No Impact. The proposed Project involves upgrades to the existing LGVSD WWTP and therefore will not divide an established community. The proposed use is consistent with the City General Plan P/QP designation and no established communities exist within the site and the proposed Project would not divide any of the communities in the surrounding area. Therefore, the Project would not physically divide an established community, and no impacts would occur.

Source: GP 2020 Exhibit 12 – Land Use Map

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant Impact. According to the Marin CWP, the proposed Project is within the Las Gallinas Valley (Planning Area 2). The land use policy for the surrounding area is Public Facility, Open Space, and Planned Designation: Agricultural and Environmental Resource Area. The LGVSD facility has parcels that are within the County and parcels that are within the City, (See Figure 2). For the portions of the project in the City, the land use designation is Public/Quasi-Public and Public/Open Space according to GP 2020.

Zoning for the proposed Project varies from City to County. The Project site is currently zoned by the City as Public/Quasi-Public (P/QP), Public/Open Space (P/OS), and Public/Open Space with a Wetland Overlay (P/OS-WO). The Project site is zoned by the County as Agriculture Limited (A2).

The portion of the proposed Project on County land is the proposed force main replacement that is in the exact location as the existing pipes. Since the replacement will have the same alignment as the existing line, the proposed Project will not conflict with the existing zoned uses. Similarly, the portion of the proposed Project that is on City land will be improvements to the existing LGVSD WWTP and road realignment. These improvements will be compatible with the P/QP designation. Therefore, any potential impacts to land use and policies will be less than significant.

Source: Marin CWP – St. Vincent's and Silveira Land Use Policy Map, GP 2020 Exhibit 12 – Land Use Map, Zoning Information, Marin GIS

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. Currently, no approved local, regional, or state habitat or natural community conservation plans exist that include any portion of the City or the County. Therefore, the proposed Project will not conflict with the provisions of an adopted Habitat Conservation Plan or Natural Community Conservation Plan. No impacts will occur in this regard.

Source: GP 2020 FEIR Appendix VIII.1 – Initial Study, Marin CWP FEIR

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XI. MINERAL RESOURCES. Would the project:				
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?	☐	☐	☐	☒

Mineral Resources Discussion:

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?

No Impact. The San Rafael Rock Quarry is the only mineral resource located in the City with local, regional, or state significance. The project site is not within or near this quarry. Therefore, no impacts will occur relating to the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

Source: GP 2020 FEIR Appendix VIII.1 – Initial Study

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?

No Impact. The San Rafael Rock Quarry is the only mineral resource located in the City with local, regional, or state significance as identified in the GP 2020 Initial Study. The project site is not within or near this quarry. Therefore, no impacts will occur that will result in the loss of availability of a delineated locally-important mineral resource recovery site.

Source: GP 2020 FEIR Appendix VIII.1 – Initial Study

Environmental Factors:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XII. NOISE. Would the project result in:				
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Noise Discussion:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact. According to GP 2020, new nonresidential projects shall not create noise impacts that would increase noise levels to more than 70 dB, at the property line of the noise receiving use, whichever is the more restrictive standard.

The City has also adopted a Noise Ordinance. The intent of the Noise Ordinance is to control excessive, unnecessary and unreasonable noises from any and all sources in the community. To limit the potential nuisance from construction noise, especially for adjacent noise sensitive receptors, the Noise Ordinance (Section 8.13 of the Municipal Code) limits the hours of construction activities from 7:00 a.m. to 6:00 p.m., Monday through Friday, and 9:00 a.m. to 6:00 p.m. on Saturdays, provided that the noise level at any point outside of the property plane of the project do not exceed 90 dBA. Construction activities are not permitted on Sundays and holidays.

During proposed Project construction, temporary increases to ambient noise levels may occur. Noise would occur from the driving and use of construction equipment such as trucks, tractors and cranes. Sensitive receptors that may be affected by Project generated noise during construction include WildCare Silveira Ranch, approximately 300 meters (980 feet) to the southwest, and the McInnis Park Apartments, approximately 600 meters (1,970 feet) southwest of the WWTP facility. The proposed outdoor generator will be shielded with a solid barrier that reduces noise between 10 and 15 dB, located 980 feet from the closest sensitive use. Each doubling of distance reduces noise impacts by 3 dBA.

Noise levels from the site due to the operation the WWTP equipment and traffic from workers commuting to and from the proposed Project site as well as delivery of materials. With the WWTP upgrade envisioned by the project, no new or significantly different operational facilities are envisioned that would increase noise levels to violate the City's noise ordinance.

The project is not located near sensitive receptors where the operational noise that already occurs on site would be elevated to a level that would be considered significant. The LGVSD will comply with the city's Noise Ordinance. Since the proposed Project site is not subject to elevated noise levels and any noise generated during construction will adhere to the San Rafael Municipal Code standards, impacts relating to exposure and generation of excess noise will be less than significant.

Source: Municipal Code – Section 8, Google Earth

b) *Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?*

Less than Significant Impact. Both construction and operation of development projects can generate ground-borne vibration. In general, demolition of structures preceding construction generates the highest vibrations. Construction equipment such as vibratory compactors or rollers, pile drivers and pavement breakers can generate perceptible vibration during construction activities. Heavy trucks can also generate ground-borne vibrations that vary depending on vehicle type, weight and pavement conditions. Other than the typical construction equipment and methods needed to demolish and construct the project components, no groundborne vibration or noise is expected.

To limit the potential nuisance from construction noise, which could include vibration and groundborne noise, especially for adjacent noise sensitive receptors, the City Noise Ordinance (Section 8.13 of the Municipal Code) limits the hours of construction activities from 7:00 a.m. to 6:00 p.m., Monday through Friday, and 9:00 a.m. to 6:00 p.m. on Saturdays, provided that the noise level at any point outside of the property plane of the project do not exceed 90 dBA. Construction activities are not permitted on Sundays and holidays.

Since the project construction methods are not anticipated to generate any significant sources of groundborne vibration/noise above those that would normally be associated with construction, and any noise generated during construction will adhere to the San Rafael Municipal Code standards, impacts relating to exposure and generation of excessive groundborne vibration or groundborne noise levels will be less than significant.

Source: Municipal Code – Section 8, Google Earth

c) *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less than Significant Impact. Permanent noise levels would be derived from the operation of the facility. The proposed upgrades to the WWTP will result in similar noise sources as the existing condition. Running of equipment, truck and employee traffic and generator noise is expected. Noise levels will be in compliance with the City of San Rafael Noise Ordinance.

The proposed Project also includes replacement of an existing indoor generator in the Headworks Building that will be replaced with a larger, outdoor, sound attenuated generator. According to the *Handbook of Environmental Acoustics*, outdoor barrier noise reduction included as a part of these generators can decrease noise impacts from approximately 10-15 dB, which is an approximate 50-65% subjective loudness reduction. In addition, since the proposed uses are similar to what is already experienced on site, and with the generator design features that include noise attenuation, impacts from project operation creating a permanent increase in noise levels will be less than significant.

Source:, Municipal Code – Section 8, Project Description, Google Earth

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant Impact. The primary source of temporary noise associated with the proposed Project is from construction activity. An L_{max} of 86 dBA at 50 feet is commonly used as a maximum construction noise limit by CalTrans. Equipment and operations are usually at or less than that level. Construction equipment that will be utilized by the proposed Project during construction and their noise limits are found in Table 12.1 below and do not exceed an L_{max} of 86 dBA.

Table 12.1 Proposed Project Construction Equipment Noise	
Equipment Description	L_{max} Noise Limit at 50 feet, dB, Slow
All other equipment more than 5 horsepower	85
Bar Bender	80
Compactor (ground)	80
Compressor (air)	80
Concrete mixer truck	85
Concrete pump truck	82
Crane (mobile or stationary)	85
Dozer	85
Dump truck	84
Excavator	85
Flatbed truck	84
Generator	82
Grader	85
Jackhammer	85
Paver	85
Pumps	77
Scraper	85
Tractor	84

Source: CalTrans TNS, Table 8-1

The proposed Project will be subject to Municipal Code Section 8, that regulates noise levels in the City. As discussed in response 12a, above, any Project-related traffic or construction noise will be temporary and will not result in substantial increases in ambient noise levels. With adherence to the City's Noise Ordinance, construction-related impacts will be less than significant.

Source: Municipal Code – Section 8, Google Earth

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 expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed Project is not located within an airport land use plan or within 2 miles of a private airstrip and as such will have no impact on people residing or working in the project area to excessive noise levels.

Source: GP 2020 FEIR Exhibit IV.4-2 Existing Airport Noise Contours

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Less than Significant Impact. The San Rafael Airport is approximately 0.34 miles from the existing LGVSD WWTP and proposed Project site. The San Rafael Airport is privately owned and is limited to based-aircraft only. Commercial flight activity, flight training and use by helicopters are prohibited. The WWTP currently operates outside the defined 60 (Ldn) and 55 (Ldn) noise contours of the San Rafael Airport. Therefore, any potential impacts will be less than significant.

Source: GP 2020 Exhibit 32 – San Rafael Airport Noise Contours, GP 2020 FEIR Exhibit IV.4-2 Existing Airport Noise Contours

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XIII. POPULATION AND HOUSING. Would the project:				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Population and Housing Discussion:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Less than Significant Impact. The proposed Project includes upgrades to the existing LGVSD WWTP and does not propose new homes or new businesses, and therefore will not directly induce substantial population growth. While the proposed Project does include road realignment, the road infrastructure will not be in a highly urbanized area and will not indirectly contribute to substantial population growth. Further, according to GP 2020 the projected 2020 population growth of the City is slower than the Bay Area as a whole, and in line with Marin County as a whole, which is the slowest growing county in the Bay Area. The treatment plant upgrades and capacity expansion are related to the need to allow more storm water to be treated at the facility during high storm events; these upgrades are not necessary to support proposed development. Therefore, the impacts from the proposed Project on inducing substantial population growth will be less than significant.

Source: GP 2020 FEIR Exhibit IV.1-4 – Population, Households, and Employment – San Rafael Planning Area, Project Description

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The proposed Project will not displace existing housing, necessitating the construction of replacement housing elsewhere because the proposed Project site is currently in use as a WWTP and has no existing housing that will be removed or affected by the proposed project. Therefore, there will be no impact on existing housing.

Source: Project Description, Google Earth

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. The project will not displace existing housing, necessitating the construction of replacement housing elsewhere because the project site is currently in use as a WWTP and has no existing housing that will be removed or affected by the proposed project. Therefore, there will be no impact on the displacement of substantial numbers of people that necessitates the construction of replacement housing elsewhere.

Source: Project Description, Google Earth

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XIV. PUBLIC SERVICES. Would the project:				
a. 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:				
i. Fire protection?	☐	☐	☐	☒
ii. Police protection?	☐	☐	☐	☒
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

Public Service Discussion:

a) 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?

i. Fire protection?

No Impact. The proposed Project is serviced by the San Rafael Fire Department as well as the Marin County Fire Department (CSA 31). The proposed Project involves upgrades to the existing WWTP that will not cause an increase in population or any additional fire facilities or impacts to acceptable service ratios, response times, or performance objectives. Therefore, there will be no impact in terms of fire protection.

Source: GP 2020 Safety Element, Marin Countywide Plan Map 3-31 – Marin County Fire Agencies, County of Marin GIS – District Lookup

ii. Police protection?

No Impact. The proposed Project is serviced by the San Rafael Police Department as well as the Marin County Sheriff's Office. The proposed Project involves upgrades to the existing WWTP and will not cause an increase in population. Therefore, the Proposed Project will have no impact in terms of new police facilities or maintaining acceptable service ratios, response times, or other performance objectives.

Source: GP 2020 Safety Element, County of Marin GIS – District Lookup

iii. Schools?

No Impact. The proposed Project is included in the San Rafael High School District as well as the Dixie School District. The proposed Project involves upgrades on an existing WWTP site and will not cause an increase in population that would require additional school facilities. Therefore, there will be no impact in terms of school service.

Source: County of Marin GIS – District Lookup

iv. Parks?

No Impact. The proposed Project site is included in the jurisdiction of the San Rafael Department of Parks and Recreation. The John F McInnis County Park is located adjacent to the Project site and is managed by Marin County Parks. Since the proposed Project involves upgrades to an existing WWTP that will not cause an increase in population, there will be no need to provide additional park service. Therefore, no impacts will occur in terms of adverse physical impacts associated with the provision of new park facilities.

Source: GP 2020 Exhibit 26 – Parks and Recreation Facilities, 2004, County of Marin GIS – District Lookup

v. Other public facilities?

No Impact. The proposed Project is serviced by two public libraries in the City of San Rafael, the Downtown Library and the Pickleweed Library. The proposed Project will not cause an increase in the population and thereby will not require the construction of new public facilities. Therefore, no impacts related to other public facilities will occur.

Source: Marin Countywide Plan Map 3-22 – San Rafael Community Facilities and Sphere of Influence, Google Earth

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XV. RECREATION.				
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?	☐	☐	☐	☒

Recreation Discussion:

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?

No Impact. The proposed Project involves upgrades to the current LGVSD WWTP and will not cause an increase in the population. Therefore, the proposed Project would not 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. No impacts will occur in this regard.

Source: Project Description

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?

No Impact. The Project will not include new public recreational facilities or require the construction or expansion of recreational facilities. Therefore, there will be no impact in this regard.

Source: Project Description

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a. Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b. Conflict with applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for	☐	☐	☐	☒

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
designated roads or highways?				
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e. Result in inadequate emergency access?	☐	☐	☒	☐
f. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

Transportation and Traffic Discussion:

a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less than Significant Impact. According to GP 2020, no arterials operating at level of service (LOS) E & F during A.M. and P.M. peak hours are located near the Project site. Any increase in traffic during construction will be minimal and will not conflict with any existing circulation plans. Access to the proposed Project is located via Smith Ranch Road, a small access road. The proposed Project site is not adjacent to any relevant intersections, streets, highways or freeways, pedestrian or bicycle paths, or mass transit as identified in the GP 2020 FEIR. Therefore, any potential impacts on the effectiveness of the circulation system will be less than significant.

Source: GP 2020 Exhibit 20 – Arterial Level of Service, GP 2020 FEIR, Google Earth

b) Conflict with applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

No Impact. Each county in California is required to develop a Congestion Management Program (CMP) that analyzes at the links between land use, transportation and air quality. The Transportation Authority of Marin (TAM) is the County's Congestion Management Agency (CMA). The TAM prepares and periodically updates the County's CMP to meet federal Congestion Management System guidelines and state CMP legislation.

According to Figure 1 – Marin County CMP Network, in the TAM 2015 CMP Update, the segment of US 101 from Freitas Parkway to Lucas Valley Road is the only road in proximity to the Project site listed as part of the CMP System of Highways and Roadways. This road segment is not adjacent to the Project site, and therefore the Project will have no impact in this regard.

Source: 2015 TAM CMP Update

c) Result in change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The proposed Project involves upgrades to the existing LGVSD WWTP that includes primarily low-lying structures. Implementation of the proposed Project will not change air traffic patterns, increase air traffic levels or change the location of air traffic patterns. As such, no impact will occur.

Source: GP 2020 Exhibit 32 – San Rafael Airport Noise Contours, GP 2020 FEIR Exhibit IV.4-2 Existing Airport Noise Contours

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less than Significant Impact. The proposed Project does not propose any design features that would increase traffic hazards. All road improvements will be compatible with existing adjacent uses. As conditioned, the project will have a less than significant impact on increasing hazards through design or incompatible uses.

Source: Project Site Plans

e) Result in inadequate emergency access?

Less than Significant Impact. The project site currently has access from Smith Road which provides the current emergency access and will continue to do so after the upgrades are implemented. Additionally, the site access main road is proposed to be improved. The main road will be realigned and raised from the middle of the facility to the perimeter to account for potential sea level rise issues along with storm events. This improvement will enhance the project site's emergency access. The Project will be reviewed by the City Fire Department to ensure compliance with the Fire Code. As such the Project will provide adequate emergency access in accordance with City regulations and requirements. Therefore, a less than significant impact will occur.

Source: Municipal Code – Title 4 – Fire

f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Less than Significant Impact. The Circulation Element of GP 2020 includes provisions for increasing transportation alternatives to automobile use. Also, the Metropolitan Transportation Commission, the regional transportation agency for planning and allocating funding, adopted a Regional Transportation Plan which coordinates regional transportation systems and improvements. The proposed Project would adhere to the County and regional policies, plan, and programs in place to support alternative modes of transportation for employees of the WWTP. Adherence to these provisions would reduce potential impacts to less than significant.

Source: GP 2020 FEIR Appendix VIII.1 – Initial Study

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XVI. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b. Require or result in the construction of new water or wastewater treatment or facilities or expansion of existing facilities, the construction of which could cause significant	☐	☐	☒	☐

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
environmental effects?				
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e. 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?	☐	☐	☒	☐
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g. Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Utilities and Service Systems Discussion:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No Impact. The proposed Project is in the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB). The existing LGVSD WWTP holds permits from the San Francisco Bay RWQCB to maintain operations. The proposed Project involves upgrades to the existing WWTP to increase treatment capacity. The current WWTP has secondary treatment capacity limited to about 9 Million Gallons per Day (MGD) under peak wet weather flow conditions. The WWTP experiences a number of wet weather events each year with flows above 9 MGD that require primary effluent to be routed around the secondary and tertiary process and blended with secondary/tertiary effluent for combined disinfection and discharge. Although the WWTP's current permit allows this wet weather flow routing, the Regional Water Quality Control Board (RWQCB) is requiring more documentation each permitting cycle to justify less than secondary treatment of all flows. The current capacity limitation is due to a single secondary clarifier that can only handle flows up to 9 MGD. Construction of additional secondary clarifiers would alleviate this limitation during wet weather conditions. Therefore with the project implemented, there will be no impact in terms of exceeding wastewater treatment requirements of the San Francisco Bay RWQCB.

Source: Marin CWP FEIR

b) Require or result in the construction or relocation of new water or wastewater treatment or transmission facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less than Significant Impact. The proposed Project is an upgrade to the LGVSD WWTP to which environmental impacts herein are being evaluated. The analysis included herein indicates that all environmental effects are less than significant associated with the upgrades to the existing WWTP facility.

Source: Project Description

c) 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?

Less than Significant Impact. The proposed Project itself includes improvements to the existing WWTP facility so that wet weather events can be treated appropriately at the WWTP prior to discharge. The storm drain facilities being designed and implemented from surrounding development is treated at LGVD's WWTP. Therefore, the project has a beneficial impact to storm water drainage and impacts are considered less than significant.

Source: Project description

d) *Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*

Less than Significant Impact. The Marin Municipal Water District (MMWD), a public utility governed by an elected board, provides water service generally to all eastern Marin cities south of Novato, including San Rafael. MMWD facilities include six area reservoirs, two water treatment plants, storage tanks, pumps, and lines. The primary source of water for MMWD is rainfall stored in two of the area reservoirs. The district also maintains a line intertie with the North Marin Water District for Russian River water. The total current storage capacity of the MMWD is approximately 80,000 acre feet. Seventy-two percent of the water used within the MMWD is from local reservoirs, 26 percent came from the Russian River in Sonoma County, and two percent was from recycled water.

MMWD has developed an urban water management plan (UWMP) as well as a Long Range Capital Program. These plans provide the MMWD with a planning tool that considers all projects necessary to provide adequate water supply to the service area. Because the project is the upgrades to an existing WWTP facility, no new potable water supply entitlements are needed. Any potential impacts relating to sufficient water supply to serve the proposed Project will be less than significant.

Source: GP 2020 FEIR

e) *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?*

Less than Signficant Impact. The wastewater treatment provider for the proposed Project is the LGVSD itself. The proposed Project is an upgrade of the existing WWTP to increase treatment capacity to accommodate wet weather events. Therefore, there impacts are considered less than significant in terms of adequate wastewater treatment capacity.

Source: GP 2020 FEIR, Project Description

f) *Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*

Less than Significant Impact. The principal landfill for residential and commercial wastes generated within the Planning Area is the Redwood Sanitary Landfill, located in northern Marin County. The projected landfill closure year for Redwood Landfill is 2032. The majority of solid waste generation as a result of Project implementation will be construction-related some of which can be recycled. Therefore, potential impacts related to landfill capacity and solid waste disposal needs will be less than significant.

Source: GP 2020 FEIR

g) *Comply with federal, state, and local statutes and regulations related to solid waste?*

No Impact. The collection and disposal of solid waste would conform to applicable federal, State, and local plans and regulations, including AB 939 (Integrated Waste Management Act) and the Marin County Integrated Waste

Management Plan. LGVSD will adhere to all federal, State and local regulations related to solid waste during construction and operation. Therefore, the proposed Project would have no impact in terms of complying with federal, state, and local statutes and regulations related to solid waste.

Source: GP 2020 FEIR Appendix VIII.1 – Initial Study

ENVIRONMENTAL FACTORS:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
MANDATORY FINDINGS OF SIGNIFICANCE.				
a. Does the project have the potential to 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, reduce the number or restrict the range of a rare or an 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?	☐	☐	☒	☐

Mandatory Findings of Significance Discussion:

a) Does the project have the potential to 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, reduce the number or restrict the range of a rare or an endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less than Significant Impact with Mitigation. As discussed throughout the Initial Study, the proposed Project area contains some sensitive biological resources that could potentially be affected by the project. All potentially significant impacts to biological resources would be avoided or reduced to a less than significant impact with the implementation of **MM Bio 1**, **MM Bio 2**, **MM Bio 3**, **MM Bio 4, and MM Bio 5** identified in this initial study and measures already incorporated into the project.

The presence of any previously recorded or potential cultural resources was not found on the proposed Project site. Further, the site has been previously disturbed and it is highly unlikely that any cultural resources could exist. However, in order to provide protection in the unlikely event that culutral resources are unearthed during Project construction, implementation of mitigation measure **MM CR 1 and MM CR 2** will reduce potential impacts to less than significant with mitigation.

Therefore, the proposed Project's impacts in terms of the potential to 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, reduce the number or restrict the range of a rare or an endangered plant or animal or eliminate important examples of the major periods of California history or prehistory will be less than significant with mitigation incorporated.

Source: Initial Study

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)?

Less than Significant. The proposed Project involves upgrades to the currently operating WWTP and replacement of an existing force main line. The current WWTP has secondary treatment capacity limited to about 9 Million Gallons per Day (MGD) under peak wet weather flow conditions. The WWTP experiences a number of wet weather events each year with flows above 9 MGD that require primary effluent to be routed around the secondary and tertiary process and blended with secondary/tertiary effluent for combined disinfection and discharge. Although the WWTP's current permit allows this wet weather flow routing, the Regional Water Quality Control Board (RWQCB) is requiring more documentation each permitting cycle to justify less than secondary treatment of all flows. The current capacity limitation is due to a single secondary clarifier that can only handle flows up to 9 MGD. Construction of additional secondary clarifiers would alleviate this limitation during wet weather conditions, providing a beneficial impact to water quality and treatment capacity.

Therefore, as the upgrades are considered beneficial, currently or in the future, the proposed Project's impacts are not expected to contribute to any cumulatively considerable impacts.

Source: Initial Study, Project Description

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than Significant Impact. Effects on human beings were evaluated as part of the aesthetics, air quality, hazards and hazardous materials, hydrology & water quality, noise, population and housing, and traffic sections of this initial study and found to be less than significant for each of the above sections. Based on the analysis and conclusions in this initial study, the proposed Project will not cause substantial adverse effects directly or indirectly to human beings. Therefore, potential direct and indirect impacts on human beings that result from the proposed Project are considered less than significant.

Source: Initial Study

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Sections 65088.4, Gov. Code; Sections 210808(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; *Sundstrom v. County of Mendocino,* (1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors,* (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; P*rotect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109*; San Francisco Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

EARLIER ANALYSES

Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration as per California Code of Regulations, Section 1503 (c) (3) (D).

Earlier Analysis Used, if any:

None

REFERENCES AND BIBLIOGRAPHY

The following documents were referred to as information sources during preparation of this document. They are available for public review at the locations abbreviated after each listing and spelled out at the end of this section. Some of these documents may also be available at the Downtown Library in San Rafael.

Cited As:	Source:
AQ/GHG	Yorke Engineering, LLC, *Air Quality & GHG Impact Analysis: Las Gallinas Valley Sanitary District Secondary Treatment Upgrade*, March 2016. (Appendix A)
Basin Plan	California Regional Water Quality Control Board San Francisco Bay Region, *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*, approved January 18, 2007. (Available at http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml, accessed January 14, 2016.)
Bio	Dudek, *Biological Resources Assessment for the Proposed Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project, San Rafael, Marin County, California*, March 14, 2016. (Appendix B)
CAL FIRE	California Department of Forestry and Fire Protection, Marin County Very High Fire Hazard Severity Zones in LRA. (Available at http://www.fire.ca.gov/fire_prevention/fhsz_maps_marin, accessed January 12, 2016.)
CalTrans	California Department of Transportation, *Officially Designated State Scenic Highways and Historic Parkways. (*Available at http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm, accessed January 8, 2016.)
CalTrans TNS	California Department of Transportation, Technical Noise Supplement, prepared November 2009.
CBC	California Building Standards Commission, California Building Code, California Code of Regulations Title 24, Part 2, Volume 1 of 2, 2013. (Available at http://www.ecodes.biz/ecodes_support/Free_Resources/2013California/13Building/13Building_main.html, accessed January 14, 2016.)
CCR	California Code of Regulations. (Available at https://govt.westlaw.com/calregs/Index?transitionType=Default&contextData=%28sc.Default%29, accessed January 14, 2016.)
Code of Federal Regulations	Code of Federal Regulations, Title 49 Transportation. (Available at http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49tab_02.tpl, accessed January 14, 2016.)
Cultural	Dudek, *Cultural Resources Report for the Proposed Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project, Marin County, California*, March 10, 2016. (Appendix C)
DOC	California Department of Conservation, California Important Farmland Finder. (Available at http://maps.conservation.ca.gov/ciff/ciff.html, accessed January 8, 2016.)
DTSC	California Department of Toxic Substances Control, EnviroStor Database. (Available at http://www.envirostor.dtsc.ca.gov/public/, accessed January 14, 2016.)
FEMA	Federal Emergency Management Agency, Flood Map Number 06041C0294D & 006097C110G. (Available at https://msc.fema.gov/portal/search?AddressQuery=300%20smith%20ranch%20road%2C%20san%20rafael%2C%20ca#searchresultsanchor, accessed January 14, 2016.)

Google Earth	Google Earth Pro 7.1.5.1557, accessed on January 4, 2016.
GP 2020	City of San Rafael, *The City of San Rafael General Plan 2020*, adopted November 15, 2004, updated for adoption of Sustainability Element, July 2011. (Available at http://www.cityofsanrafael.org/Government/Community_Development/Planning.htm, accessed January 4, 2016.)
GP 2020 FEIR	City of San Rafael, *San Rafael General Plan 2020 – General Plan Update Final Environmental Impact Report*, Certified November 15, 2004. (Available at http://www.cityofsanrafael.org/Government/Community_Development/Planning.htm, accessed January 4, 2016.)
Handbook of Env Acoustics	Cowan, J. P., *Handbook of Environmental Acoustics*, published 1994.
Health and Safety Code	California Health and Safety Code. (Available at http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=hsc, accessed January 14, 2016.)
Marin CWP	Marin County, *Marin Countywide Plan*, Adopted November 6, 2007, as amended January 27, 2009. (Available at http://www.marincounty.org/depts/cd/divisions/planning/2007-marin-countywide-plan, accessed January 4, 2016.)
Marin CWP FEIR	Marin County, *Marin Countywide Plan Update Final Environmental Impact Report*, Certified November 6, 2007. (Available at http://www.marincounty.org/depts/cd/divisions/planning/2007-marin-countywide-plan/countywide-plan-environmental-impact-report, accessed January 4, 2016.)
Marin GIS	Marin County Community Development, Zoning General Plan Lookup. (Available at http://gis.marinpublic.com/Html5Viewer/Index.html?viewer=zonelookup, accessed January 15, 2016.)
MS4 General Permit	State Water Resources Control Board, General Permit for Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Order No. 2013-0001-DWQ, NPDES No. CAS000004, effective on July 1, 2013.
Municipal Code	City of San Rafael, Municipal Code. (Available at https://www.municode.com/library/ca/san_rafael/codes/code_of_ordinances?nodeId=TIT4FI_CH4.08FICO, accessed on January 15, 2016.)
NPDES	San Francisco Bay Regional Water Quality Control Board, NPDES No. CA0037851, effective on July 1, 2015.
OES	San Rafael Office of Emergency Services, *Two-Year Progress Report on the OES 2007-2012 Emergency Management Strategic Plan*. (Available at http://www.cityofsanrafael.org/oes-docs/, accessed January 12, 2016.)
TAM CMP	Transportation Authority of Marin, *Final Report 2015 CMP Update – Marin County*, updated September 24, 2015. (Available at http://www.tam.ca.gov/index.aspx?page=84, accessed January 15, 2016.)
USACE	United States Army Corps of Engineers, CorpsMap Viewer. (Available at http://corpsmapu.usace.army.mil/cm_apex/cm2.cm2.map, accessed January 14, 2016.)
Zoning	City of San Rafael, Online Zoning Information. (Available at http://www.cityofsanrafael.org/zoning, accessed January 8, 2016.)

Persons Contacted

Justin Logan, AQUA Engineering, Personal communication, 1/12/16.

LIST OF INITIAL STUDY PREPARERS

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RESPONSE TO COMMENTS

Pursuant to State *CEQA Guidelines* Section 15073, the IS/MND was circulated for a 30-day period between April 29, 2016 through June 3, 2016, to the State Clearinghouse, Marin County Clerk, Responsible Agencies, and interested parties for review and comment. No new effects were identified during the public comment period.

State *CEQA Guidelines* Section 15074 requires the decision-making body to consider the proposed IS/MND together with any comments received during the public review process. There is no requirement for a formal response to each of the comments received (unlike the requirement for a Final Environmental Impact Report). However, in order to provide the Las Gallinas Valley Sanitary District (LGVSD) Board of Directors with additional information upon which to base their decision, the following Responses to Comments have been prepared. The materials contained in this document include copies of verbal comment requests and the District's responses. Each comment is labeled alphabetically.

The District has prepared this Response to Comments package to address environmental comments received during the CEQA public review period. No comment letters were received during the public review period. Comments via telephone were received by two different agencies. Responses to those comments were prepared and sent via email. Each comment and email correspondence is provided in this report. The responses are provided following each email correspondence. All verbal and written comments have been made a part of the public record and have been forwarded to the LGVSD Board of Directors for consideration.

LIST OF PERSONS, ORGANIZATIONS AND AGENCIES THAT COMMENTED ON THE INITIAL STUDY

Table 1-A – Comments Received During Public Comment Period

Comment	Agency/Name	Date
A	California Department of Transportation (Caltrans) / Cole Iwamasa	May 5, 2016
B	Bay Area Air Quality Management District / Andrea Gordon	May 17, 2016
C	Bay Area Air Quality Management District / Andrea Gordon	May 25, 2016

Where comments received on the IS/MND during the public review period resulted in changes to the text of the IS/MND, such changes are shown in the Final IS/MND using the following conventions:

- Text added to the Final IS/MND is shown as <u>underline.</u>
- Text deleted from the Final IS/MND is shown as ~~strikethrough.~~

Textual changes to the Final IS/MND do not constitute "substantial revision" as defined in State *CEQA Guidelines* Section 15073.5(b); therefore, recirculation of the IS/MND is not required. No comments resulted in changes to the text of the IS/MND.

Comment A

From: Mike Cortez <mcortez@lgvsd.org> Sent: Thu 5/5/2016 11:41 AM
To: Stephanie Standerfer
Cc: Brian Knoll; Justin Logan; Jillian Feyk-Miney; Irene Huang
Subject: Draft CEQA Documents - IS/MND for Secondary Treatment Upgrades

Hi Stephanie,
Caltrans is requesting traffic info related to the IS/MND. Please respond to Cole at cole.iwamasa@dot.ca.gov.
Thank you,

Michael P. Cortez, PE
District Engineer
Las Gallinas Valley Sanitary District
Direct Line: 415-472-1033 ext. 18

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Response to Comment A – Caltrans/Cole Iwasama

The verbal comment requested information on the number of construction truck trips expected from the Project via phone on May 5, 2106. A phone call responding to the question was made on May 10, 2016. As requested, an Excel spreadsheet with the construction truck trip information for the Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project was prepared. Construction was modeled and broken up into phases that do not overlap. In addition, the specific construction activities do not overlap. This information was pulled from the IS/MND Appendix A - Air Quality & GHG Impact Analysis prepared by Yorke Engineering, March 2016. The Excel spreadsheet and and Appendix A were attached and sent via email to Cole Iwasama (cole.iwasama@dot.ca.gov) on May 10, 2016. The Excel spreadsheet contained the following information:

Phase 1 (pg. 87)	**worker trips/day**	**vendor trips/day**	**hauling trips total**
Demolition	10		104
Site Preparation	5		
Grading	10		
Building Construction	21	8	
Phase 2 (pg. 125)			
Demolition	10		81
Site Preparation	8		
Grading	13		
Building Construction	38	15	
Paving	20		
Phase 3 (pg. 174)			
Demolition	13		48
Site Preparation	8		
Grading	8		
Building Construction	33	13	

No other information was requested. The comment did not identify any significant new information not previously addressed in the Draft IS/MND. Therefore, no further response is required.

Comment B

From: Mike Cortez <mcortez@lgvsd.org> Sent: Tue 5/17/2016 8:52 AM
To: Stephanie Standerfer
Cc: Jillian Feyk-Miney; Brian Knoll; Justin Logan; Irene Huang
Subject: Draft CEQA Documents - IS/MND for Secondary Treatment Upgrades BAAQMD

Hi Stephanie,
Please contact Andrea Gordon with the Bay Area Air Quality Management District (BAAQMD) regarding the draft CEQA . She has a question about air pollutants for the expansion not being included in the study. Her contact info is agordon@baaqmd.gov, or you may call her at 415-749-4940.
Thanks,

Michael P. Cortez, PE
District Engineer
Las Gallinas Valley Sanitary District
Direct Line: 415-472-1033 ext. 18

Response to Comment B – BAAQMD/ Andrea Gordon

The verbal comment requested information on the air quality analysis methodology via phone on May 17, 2016. A follow up call was made on May 17, 2016 regarding her question about organic emissions as reported in the draft Air Quality Analysis for the Las Gallinas Upgrade Project. The following response was provided to Andrea Gordon (agordon@baaqmd.gov) on May 18, 2016:

Thank you for your inquiry regarding the Draft Air Quality & GHG Impacts Analysis: Las Gallinas Valley Sanitary District Secondary Treatment Upgrade (analysis), prepared in support of CEQA for the proposed project.

Per our phone conversation on 5-17-2016, we understand that the BAAQMD would like clarification as to why the estimated increase in operational emissions in the analysis was limited to only organic pollutants and didn't show other emissions, specifically an increase in bio-gas generation or combustion, since the project is proposing an increase in the daily average annual flowrate for the plant.

The scope of the proposed project is limited to process changes designed to increase the wet weather capacity and mainly involve modifications in the operations/processes downstream of the main wastewater treatment operations (main processes include influent treatment, grit removal, primary clarification, digestion etc.) —and are specific to the processes from the secondary clarifiers to the point of effluent discharge. Treatment processes upstream of the secondary clarifiers are not impacted by the project, therefore since there is no projected flow increase through the treatment processes upstream of the secondary clarifiers there is no change in emissions from these sources. Moreover, as such, no increase in flows to the digesters are planned and therefore there is no increase in digester gas or combustion emissions.

Operational emissions were estimated using BAAQMD-specific emission factors for wastewater systems to quantify the incremental liquid-borne emissions on an annual average basis and on a highest day basis and are based on. The emission factors used in the CEQA report for the downstream wastewater processes came from a BAAQMD emission estimation method adopted from several studies resulting in several different methods of estimating emissions from wastewater. These liquid-borne emission estimation methods were based on volatile organic compounds (VOCs) and certain toxic air contaminants (TAC) within the VOC category, since it was understood from previous studies that there would be no so-called "criteria pollutant" emissions (other than VOC) from the wastewater. These factors are in units of lb/year-MGD of VOC as well as certain TAC. In estimating the emissions increase, we used the following assumptions:

- Annual Increment (MGD): The Bay Area AQMD permitted average (annual) flowrate is currently 2.7 MGD for the existing plant. The project assumes a future influent design flow of 3.2 MGD annual average flowrate, hence the annual average flow increase is 0.5 MGD. This slight increase is due to the additional flows from wet weather periods – averaged over the year.

- Peak Daily Wet Weather (MGD): For the purposes of CEQA we estimated the peak daily incremental emissions increase as the difference between the existing secondary treatment capacity of about 9 MGD under peak wet weather flow conditions and the project wet weather design criteria of 18 MGD as a peak wet weather flowrate, or an increase of 9 MGD on a daily basis. Therefore, peak daily impacts during operation of the proposed project will be represented by an incremental change of 9 MGD and compared to daily CEQA significance criteria.

The incremental emissions calculations are conservative in that the factors are based on normal average wastewater influent, although the wet weather flows would be essentially storm water and therefore much more dilute.

Let me know if you still have additional questions or wish to discuss this further.

The comment did not identify any significant new information not previously addressed in the Draft IS/MND. Therefore, no further response is required.

Comment C

From: Randy Frazier (RFrazier@YorkeEngr.com) <rfrazier@yorkeengr.com> Sent: Wed 5/25/2016 4:25 PM
To: Stephanie Standerfer; Mike Cortez; Jillian Feyk-Miney; Brian Knoll; Justin Logan; Irene Huang; Michael Dudasko (MDudasko@YorkeEngr.com); Greg Wolffe (GWolffe@YorkeEngr.com)
Cc:
Subject: RE: Draft LGVSD Secondary Treatment Upgrade Analysis: Operational Emissions-VOC Emissions

LGVSD Project Team,

Andrea Gordon (BAAQMD) called just now and offered the following verbal comments regarding the *Draft Air Quality & GHG Impacts Analysis: Las Gallinas Valley Sanitary District Secondary Treatment Upgrade (analysis)*. The District is not sending a formal comments letter at this point, opting instead to provide verbal comments. We will review and provide clarification or determine if any additional effort is needed.

Comments:

- Double check the number of phases listed in the Appendices, as there may be a discrepancy. Clarification may be needed.
- Toxic risk section does not appear to list the exposure factors used to estimate cancer risk. Request that these be listed.
- Recommending that the document address the emissions for the entire facility plus any other nearby emitting facilities and mobile sources to assess all potential impacts.
- Aerscreen met data from Marsh Landing used when the LVVSD is in Marin Count. BAAQMD requests justification for the use of the Aermet met data. A footnote explaining why the above data was used will be adequate.
- Confirm whether urban or rural dispersion modelling was used. If urban, needs justification. Typical default is rural.
- Average rainfall should be addressed at an appropriate location in the document (Andrea didn't specify where).
- Odor mitigation measures from equipment and potential complaints needs to be addressed.

Brad,
Can you please review, and call me if you have questions.

Thanks,

Randy E. Frazier, PE, CAPP
Principal Engineer
Cell: (925) 605-8471
Fax: (949) 248-8499
E-mail: Rfrazier@YorkeEngr.com

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Oakland, CA 94612

Response to Comment C

The verbal comment requested additional information on the air quality analysis via phone on May 25, 2016. The following response was provided to Andrea Gordon (agordon@baaqmd.gov) on June 7, 2016:

Thank you for your call to Randy Frazier at Yorke Engineering on May 25, 2016 providing verbal comments on the *Draft Air Quality & GHG Impacts Analysis: Las Gallinas Valley Sanitary District Secondary Treatment Upgrade* air quality analysis. Below we have put your verbal comments in writing, and provided you and the BAAQMD with our responses in red. We will be incorporating these into the Final Mitigated Negative Declaration (MND) for the project.

Comments:

- Please clarify the number of phases listed in the Appendices.
  The Project consists of 4 phases spread out over 3 years: Phases 1 and 2 in 2017, Phase 3 in 2018, and Phase 4 in 2019. Phases 1 and 2 were modeled together in the air quality analysis to be conservative. Therefore, in the model, the phases are broken into 3 phases (1A, 1B, 2, and 3).
- Please provide a list of the exposure factors used to estimate cancer risk in the toxic risk section.
  As incorporated by reference, the exposure factors used are contained in HARP2, California Air Resources Board (CARB). 2016. Hotspots Analysis and Reporting Program Version 2 (HARP2) Risk Assessment Standalone Tool (RAST), version 16057. Website (http://www.arb.ca.gov/toxics/harp/rast.htm) accessed February 26, 2016.
- Please explain why the document does not address the emissions for the entire facility plus any other nearby emitting facilities and mobile sources to assess all potential impacts.
  The scope of the analysis is limited to the upgrade of the facility, i.e., the proposed project, which consists of demolition and re-construction of the affected parts of the facility and net changes in operational emissions due to the upgrade. Unaffected sources, such as existing unmodified parts of the facility and virtually unchanged operational employee and vendor traffic, are outside the scope of the project.
- Please clarify why met data from Marsh Landing was used for air dispersion modeling using AERCSREEN when the LVVSD is located in Marin County.
  Dispersion coefficients were developed for albedo, Bowen ratio, and surface roughness using the Marsh Landing values, in accordance with BAAQMD approval in 2014 for another project which was near the Bay shoreline. Since Las Gallinas is also near the Bay shoreline at about the same latitude as Marsh Landing, the same general approach was taken due to the geographic similarities between the projects and prior BAAQMD input. The BAAQMD referenced method is Bay Area Air Quality Management District (BAAQMD). 2012c. Risk and Hazard Screening Analysis Process Flow Chart & Screening Analysis Tools – Stationary Source, Highway, Roadway. Website (http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools) accessed March 24, 2016. Subsequent Bay Area Air Quality Management District (BAAQMD) communication with Alison Kirk via e-mail, September 18, 2014.
- Confirm whether urban or rural dispersion modelling was used and provide justification if urban.
  Urban dispersion was used because the facility and receptors are located within the boundaries of the City of San Rafael, which is a urban area.
- Please provide average rainfall information for the area.
  San Rafael Civic Center showed 35.7 inches/year on average for the past 30-years (World Climate, San Rafael, California. Website (http://www.worldclimate.com/cgi-bin/data.pl?ref=N38W122+2300+047880C) accessed June 6, 2016.
- Please address odor mitigation measures from equipment and potential complaints.
  Due to the features of the secondary treatment upgrade which includes odor controls, the proposed Project is not expected to create objectionable odors at the residential and worker receptors which are located at substantial distances from the facility. At the time of the project, the nearest worker is the WildCare Silveira Ranch, located 300 meters (980 feet) southwest (Formerly Helen Vine Detox Center). The nearest residence is the McInnis Park Apartments, located 600 meters (1,970 feet) southwest. The project will reduce odors through controls.

Thank you for your comments.

The comment did not identify any significant new information not previously addressed in the Draft IS/MND. Therefore, no further response is required.

MITIGATION MONITORING AND REPORTING PROGRAM

Pursuant to State *CEQA Guidelines* Section 15097, a written Mitigation Monitoring and Reporting Program (MMRP) has been compiled to verify implementation of adopted mitigation measures. "Monitoring" refers to the ongoing or periodic process of project oversight. "Reporting" refers to written compliance review that will be presented to the responsible parties included in the table below.

The following table provides the required information which includes identification of the potential impact, the various mitigation measures, applicable implementation timing, identification of the agencies responsible for implementation, and the monitoring/reporting method for each mitigation measure identified. This MMRP is set up as a Compliance Report, with space for confirming the mitigation measures have been implemented.

The following clarifies the meaning of each column in the MMRP:

Impact Category/ Mitigation Measure	Impact category identifies potentially affected resource/environmental condition. Those measures that will be implemented to minimize possible significant environmental impacts.
Implementation Timing	The phase of the project during which the mitigation measure shall be implemented and monitored.
Responsible Monitoring Party	Identifies the entity responsible for monitoring implementation of the mitigation measure.
Monitoring/Reporting Method	Identifies mechanism by which implementation will be verified.
Compliance Verification	Signature/initials and date at time of completion

The following mitigation measures contain acronyms that are defined in the mitigation measure text with a few exceptions. Those exceptions are defined as follows:

CDFW	California Department of Fish and Wildlife
LGVSD	Las Gallinas Valley Sanitary District
RWQCB	Regional Water Quality Control Board
USACE	U. S. Army Corps of Engineers

Mitigation Monitoring and Reporting Program

Impact Category and Mitigation Measures	Implementation Timing	Responsible Monitoring Party	Monitoring/ Reporting Method	Compliance Verification
BIOLOGICAL RESOURCES				
MM BIO 1: A pre-construction focused survey for soft salty bird's-beak and other rare and special-status plants will be conducted by a qualified botanist during the blooming period(s) of the target species. If a special-status species is observed, impacts should be avoided or minimized per the botanist's recommendation. If impacts are unavoidable, mitigation will be required in the form of: (1) methods of soil removal that ensure the existing layer of topsoil is not damaged or buried and is replaced as the top layer of soil after the force main is installed and backfilled; or (2) preservation and enhancement of lands supporting existing populations of the special-status species elsewhere, per the botanist's recommendation.	Prior to construction	LGVSD Qualified Biologist Construction Contractor	Completed pre-construction survey with negative results.	
MM BIO 2: A pre-construction nesting bird survey will be performed by a qualified biologist no earlier than two weeks prior to the initiation of construction activities. If any active nests are found, a suitable buffer will be determined by the biologist and the nest will be flagged and avoided until the eggs have hatched and the chicks have fledged.	14 days prior to construction activities	LGVSD Qualified Biologist Construction Contractor	Completed pre-construction survey with negative results.	
MM BIO 3: A pre-construction roosting bat survey will be completed to assess whether any active bat roosts are located within the Project area. These surveys would be performed in the early spring when maternity colonies are being formed. If no maternity colonies exist in the Project area, but day roosts are found, an exclusion plan would be developed in coordination with CDFW prior to initiation of construction.	Prior to construction in the early spring	LGVSD Qualified Biologist CDFW	Completed pre-construction survey with negative results.	

Impact Category and Mitigation Measures	Implementation Timing	Responsible Monitoring Party	Monitoring/ Reporting Method	Compliance Verification
MM BIO 4: To minimize impacts on vegetation communities from project construction activities, all previously undeveloped areas including annual grassland, annual grassland disturbed, and eucalyptus grove that are disturbed by construction activities should be returned to pre-project grades and contours to the maximum extent practicable. Any exposed soils should be stabilized, protected from wind and water erosion and seeded with an appropriate native/naturalized seed mix.	During and after construction	LGVSD Construction Contractor	Construction schedule	
MM BIO 5: Since three potentially jurisdictional features and two constructed basins with wetland characteristics were observed in the Project area during the field reconnaissance survey, a formal delineation of waters of the United States/State will be completed to determine the jurisdictional status of these features and whether project impacts to these features will trigger the need for permits from USACE, RWQCB and/or CDFW. If these features are determined to be jurisdictional, and cannot be avoided by project construction activities, then a permit(s) from one or more of the aforementioned regulatory agencies would be triggered and compensation for unavoidable impacts in the form of wetland creation, restoration and/or enhancement of aquatic resources similar to those impacted will be implemented.	Prior to construction	LGVSD Qualified Biologist	Completed Jurisdictional Delineation and USACE 404 permit, RWQCB 401 permit, and CDFW Lake and Streambed Alteration Agreement, if necessary	
CULTURAL RESOURCES				
MM CR 1: In the event cultural resources are inadvertently found by onsite personnel during construction, all ground disturbing activities should stop and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology should be retained to evaluate the discovered resources and recommend appropriate action.	During construction and all ground-disturbing activities	Construction contractor Qualified Archaeologist LGVSD	Archaeological report indicating disposition of resource, if applicable	

Impact Category and Mitigation Measures	Implementation Timing	Responsible Monitoring Party	Monitoring/ Reporting Method	Compliance Verification
MM CR 2: In the event paleontological resources are inadvertently found by onsite personnel during construction, all ground disturbing activities should stop and a qualified paleontologist should be retained to evaluate the discovered resources and recommend appropriate action in accordance with the standards and guidelines of the Society of Vertebrate Paleontology.	During construction and all ground-disturbing activities	Construction contractor Qualified Paleontologist LGVSD	Paleontological report indicating disposition of resource, if applicable	

APPENDIX A: AIR QUALITY & GHG IMPACT ANALYSIS

Air Quality & GHG Impact Analysis: Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

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March 2016

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Air Quality & GHG Impact Analysis: Las Gallinas Valley Sanitary District Secondary Treatment Upgrade

1.0 INTRODUCTION

This air quality and greenhouse gas impact analysis has been prepared in support of a proposed upgrade to the Las Gallinas Valley Sanitary District publicly owned treatment works (POTW) located at 300 Smith Ranch Road in San Rafael, California. The POTW occupies a land area of 7.35 acres of which approximately 5 acres would comprise the Project area (construction zone).

The content of the analysis follows the Air Quality and Greenhouse Gas Sections of Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Environmental Checklist Form), which contains lists of environmental significance criteria under 17 topics that may be deemed potentially significant (PS), less than significant with mitigation incorporated (LTSM), less than significant (LTS), or no impact (NI). This analysis only addresses the evaluation under the Air Quality and Green House Gas Sections. Results of the air quality and greenhouse gas impact analysis are summarized in Table 1-1.

The construction analysis was performed using CalEEMod™ (California Emissions Estimation Model), the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations of land use projects under CEQA. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The mobile source emission factors used in the model (EMFAC2011) includes the Pavley standards and Low Carbon Fuel standards into the mobile source emission factors. The model also identifies mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the South Coast Air Quality Management District (SCAQMD, or District) and other California air districts, including the Bay Area Air Quality Management District (BAAQMD). Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions. As the official assessment methodology for land use projects in California, CalEEMod is relied upon herein for construction emissions quantification, which forms the basis for the construction impact analysis.

Operational emissions from waste water treatment processes were quantified using emission estimation techniques (EETs) approved by the BAAQMD and other California air districts (Appendix B). Since the POTW is an existing stationary source of criteria air pollutants, toxic air contaminants (TACs), and GHGs, only the net change in operational emissions, i.e., post-project minus pre-project, was evaluated for CEQA significance. However, absolute post-project TAC emissions were assessed for risk to nearby receptors.

At the request of the Lead Agency, the air quality and GHG analysis follows the 2010/2011 draft significance thresholds from BAAQMD. This is because the Lead Agency has determined that

Appendix D of the guidelines, in combination with BAAQMD's Revised Draft Options and Justification Report (BAAQMD 2009), provides substantial evidence to support the 2010 significance thresholds and, therefore, has determined they are appropriate for use in this analysis in lieu of the 1999 significance thresholds.

Table 1-1: CEQA Appendix G Significance Summary

Significance Criteria	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Air Quality. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			▲	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			▲	
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			▲	
d) Expose sensitive receptors to substantial pollutant concentrations?			▲	
e) Create objectionable odors affecting a substantial number of people?			▲	
Greenhouse Gases. Would the project:				
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 gases?			▲	

2.0 PROJECT DESCRIPTION

The Project site comprises a 7.35-acre parcel located at 300 Smith Ranch Road in San Rafael, California. No schools are in the vicinity of the proposed Project. The nearest receptors to the facility are institutional (worker) and residential:

- Worker: WildCare Silveira Ranch[1], 300 meters (980 feet) southwest
- Residential: McInnis Park Apartments, 600 meters (1,970 feet) southwest

A general definition of the proposed Project construction criteria is shown in Table 2-1. Appendix A contains summary and risk assessment spreadsheets (including construction Phases 1, 2, and 3 details); Appendix B contains operational emissions estimates; and Appendix C contains model outputs.

Table 2-1: Land Use Data for CalEEMod Input – All Construction Phases Summary

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet	Pop.
Built Structures	Industrial	General Light Industry	63.400	1000 sf	1.455	63,400*	0
Roadways & Parking Spaces	Parking	Other Asphalt Surfaces	25.000	1000 sf	0.574	25,000	0
Other Graded or Paved Surfaces	Parking	Other Non-Asphalt Surfaces	129.400	1000 sf	2.971	129,400	0
Undisturbed Areas	—	—	102.300	1000 sf	2.348	102,300	0
Parcel Totals					**7.35**	**320,100**	**0**

Source: Webb 2016

* includes demolition and reconstruction of 3,600 sf administration building (see Appendix A - Estimated Project Pan)

[1] Formerly Helen Vine Detox Center.

3.0 AIR QUALITY AND GHG IMPACTS ANALYSIS

The Air Quality Section of Appendix G of the CEQA Guidelines (Environmental Checklist Form) contains five air quality significance criteria. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

d) Expose sensitive receptors to substantial pollutant concentrations?

e) Create objectionable odors affecting a substantial number of people?

The Greenhouse Gas Section of Appendix G of the CEQA Guidelines contains two GHG significance criteria. Would the project:

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 gases?

The proposed Project is located within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD, or District). Therefore, the quantitative significance thresholds used to evaluate Project emissions impacts are those developed by the District (BAAQMD 2011, 2010b).

3.1 Conflict with or obstruct implementation of the applicable air quality plan?

SUMMARY OF IMPACT ANALYSIS: The proposed Project would not conflict with BAAQMD air quality planning goals because Project elements would be required to comply with all applicable BAAQMD rules and requirements during construction and operation (e.g., visible emissions, nuisance, fugitive dust, boilers/heaters, emergency generators, etc.).

IMPACT: **Less Than Significant (LTS).**

The San Francisco Bay Area Air Basin (SFBAAB) in nonattainment with state and federal ozone and $PM_{2.5}$ standards and state PM_{10} standards, and as such, has developed and adopted air quality attainment plans that could affect the proposed Project. Table 3-1 lists the attainment status of the SFBAAB for all criteria pollutants.

Due to nonattainment status, the BAAQMD periodically updates the *Bay Area Clean Air Plan* (CAP, Plan) to meet state and federal requirements and/or to incorporate the latest technical information. The CAP is the BAAQMD’s contribution to the State Implementation Plan (SIP). Each iteration of the Plan is an update of the previous Plan. The Plan is a regional and multi-agency effort (BAAQMD, California Air Resources Board [CARB], Association of Bay Area Governments [ABAG], Bay Conservation and Development Commission [BCDC], the

Metropolitan Transportation Commission [MTC], and the U.S. Environmental Protection Agency [EPA]). State and federal planning requirements include developing control strategies, attainment demonstrations, reasonable further progress, and maintenance plans. The CAP incorporates the latest scientific and technical information and planning assumptions, including the latest applicable growth assumptions, regional transportation plans/sustainable communities strategies, and updated emission inventory methodologies for various source categories (BAAQMD 2010a).

The District is updating the *2010 Bay Area Clean Air Plan* in partnership with ABAG, BCDC, and MTC. The 2016 Clean Air Plan/Regional Climate Protection Strategy (CAP/RCPS) will be a "roadmap" for the District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The CAP is required by the California Clean Air Act to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state and federal standards for ozone, PM_{10}, and $PM_{2.5}$. The CAP update will include the Bay Area's first-ever comprehensive RCPS, which will identify potential rules, control measures, and strategies that the Air District can pursue to reduce greenhouse gases in the Bay Area (BAAQMD 2010a).

Table 3-1: Attainment Status – San Francisco Bay Area Air Basin

Criteria Pollutants	Averaging Time	State Designation	Federal Designation
Ozone (O_3)	1-hour	Nonattainment	—
	8-hour	Nonattainment	Nonattainment[1]
Nitrogen Dioxide (NO_2)	1-hour	Attainment	Unclassified[2]
	Annual	Attainment	Attainment
Sulfur Dioxide (SO_2)	All	Attainment	Attainment
Carbon Monoxide (CO)	All	Attainment	Attainment
Respirable Particulates (as PM_{10})	24-hour	Nonattainment	Unclassified[2]
	Annual	Nonattainment	—
Fine Particulates (as $PM_{2.5}$)	24-hour	—	Nonattainment
	Annual	Nonattainment	Unclassified/Attainment
Lead (Pb)	All	Attainment	Attainment
Sulfates (as SO_4)	24-hour	Attainment	—
Hydrogen Sulfide (H_2S)	1-hour	Unclassified[2]	—
Vinyl Chloride (C_2H_3Cl)	24-hour	n/d	—
Visibility	8-hour	Unclassified[2]	—

Source: BAAQMD 2015a, CARB 2015a, EPA 2015a

Notes:

[1] The 0.08 ppmv federal 8-hour ozone standard applied until 2008; 0.075 ppmv until October 1, 2015.

[2] At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassified.

n/d – no data/information available

3.1.1 Ozone

Ozone (O_3) is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG)[2] and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone formation generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for about three hours. To protect public health, the EPA and CARB have established standards for ozone concentrations in ambient – or outdoor – air, as averaged over eight-hour periods. In addition to state and federal eight-hour ozone standards, California also has a one-hour ozone standard (see Table 3-2).

The SFBAAB is designated "marginal" nonattainment for ozone by both CARB and EPA with respect to California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS), respectively (CARB 2015a, EPA 2015a).

CARB mobile source emissions standards would apply to all onroad vehicles and offroad equipment used for construction of the proposed Project and post-construction worker commuting and transportation of materials and supplies for the completed Project. Also, based on a comparison of the proposed Project elements to ozone control measures, several SIP or CAP control measures could apply to operation of the proposed Project in the form of BAAQMD rules and regulations for stationary sources, including the following topics:

- Regulation 8: Organic Compounds contains rules which limit the emission of organic pollutants, many of which are ozone precursors.
- Regulation 9: Inorganic Gaseous Pollutants contains rules which limit inorganic gaseous pollutants, including NO_x which is an ozone precursor.
- Regulation 10: Standards of Performance for New Stationary Sources establishes emission and/or performance standards for new industrial plants and other sources which can emit ozone precursors and other pollutants. The rules incorporate by reference the provisions of Title 40 of the Code of Federal Regulations, Chapter 1, Subchapter C, Part 60.
- Regulation 11: Hazardous Pollutants contains rules which establish emission and/or performance standards for hazardous pollutants (HAPS) from different types of sources, some of which are also ozone precursors (ROG).

The proposed Project would also necessitate modifying the facility's existing BAAQMD operating permit due to the changes in processes, equipment, and resulting emissions. The BAAQMD permitting process would ensure that the Project meets regulatory requirements through the application review process and by placing specific operating conditions on the modified permit. Compliance with the rules, regulations, and permit conditions would ensure that the Project would not conflict with or obstruct implementation of applicable air quality plans.

3.1.2 Particulate Matter

Particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) can be inhaled into air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and

[2] Also referred to as reactive organic compounds (ROC) or volatile organic compounds (VOC).

atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

In the SFBAAB, both PM_{10} and $PM_{2.5}$ ambient concentration levels have improved dramatically over the past two decades. On January 9, 2013, the EPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. This EPA rule suspends key SIP requirements as long as monitoring data continues to show that the Bay Area attains the standard. Despite this EPA action, the Bay Area will continue to be designated as nonattainment for the national 24-hour $PM_{2.5}$ standard until such time as the Air District submits a redesignation request and a maintenance plan to the EPA, and the EPA approves the proposed redesignation (BAAQMD 2015a).

The CAP contains a comprehensive list of regulatory and incentive-based measures to reduce directly emitted $PM_{2.5}$ and precursor emissions (e.g., NO_x, SO_x, NH_3) throughout the SFBAAB. As the District continues to tighten regulations for stationary sources under its jurisdiction, state and federal agencies are also working to reduce emissions from mobile sources, which are beyond the District's direct jurisdiction. Based on a comparison of the proposed Project elements to particulate matter control measures, several SIP or CAP control measures could apply to the proposed Project in the form of BAAQMD rules and regulations, including the following:

- Regulation 6, Rule 1: General Requirements – limits the quantity of particulate matter in the atmosphere by controlling emission rates, concentrations, visible emissions, and opacity.

Also, in accordance with the District's CEQA guidelines, the proposed Project would need to develop and comply with and a construction fugitive dust control plan. In general, full and proper implementation of fugitive dust control measures at the construction site, principally surface watering several times per day, reduces fugitive dust impacts to less than significant.

MITIGATION MEASURES: **None Required.**

3.2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

SUMMARY OF IMPACT ANALYSIS: The proposed Project would be required to comply with all applicable BAAQMD rules and requirements during construction and operation which would support maintenance of generally good air quality in the Project Area. Due to the relatively small scale of the proposed Project, construction and operational emissions impacts would be relatively small.

IMPACT: **Less Than Significant (LTS).**

Table 3-2 shows current CAAQS and NAAQS, all of which apply in the SFBAAB. Table 3-3 summarizes 2012 to 2014 ambient air quality data from the BAAQMD's San Rafael air monitoring station, which is approximately 3.7 miles south of the Project site (BAAQMD 2013a).

Table 3-2: Ambient Air Quality Standards

Criteria Pollutants	Averaging Time	California Standards		Federal Standards	
		ppmv	µg/m³	ppmv	µg/m³
Ozone (O_3)	1-hour	0.09	180	—	—
	8-hour	0.07	137	0.07	137
Nitrogen Dioxide (NO_2)	1-hour	0.18	339	0.10	188
	Annual	0.03	57	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	655	0.075	196
	3-hour Secondary	—	—	0.50	1,309
	24-hour	0.04	105	0.14	367
	Annual	—	—	0.03	79
Carbon Monoxide (CO)	1-hour	20	22,898	35	40,071
	8-hour	9	10,304	9	10,304
	Lake Tahoe (8-hr)	6	6,869	—	—
Particulates (as PM_{10})	24-hour	—	50	—	150
	Annual	—	20	—	—
Particulates (as $PM_{2.5}$)	24-hour	—	—	—	35
	Annual Primary	—	12	—	12
	Annual Secondary	—	—	—	15
Lead (Pb)	30-day	—	1.5	—	—
	3-month (rolling)	—	—	—	0.15
Sulfates (as SO_4)	24-hour	—	25	—	—
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	—	—
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01	26	—	—
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per km; visibility of 10 miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70%.		—	—

Source: CARB 2015b

Notes:

ppmv = parts per million by volume

µg/m³ = micrograms per cubic meter

The 1.5 µg/m³ federal quarterly lead standard applied until 2008; 0.15 µg/m³ rolling 3-month average thereafter

For gases, ug/m³ calculated from ppmv based on molecular weight and standard conditions:

Standard Temperature: 25°C for ambient air monitoring

Standard Molar Volume: 24.465 liter/g-mole for ambient air monitoring

Table 3-3: Air Quality Data Summary for the Project Area – San Rafael

Criteria Pollutants	Applicable Standard	Monitoring Data by Year		
		2012	2013	2014
Ozone				
Maximum 1-hour average (ppb)	—	76	81	88
Days over 1-hour state standard	90 ppb	0	0	0
Maximum 8-hour average (ppb)	—	57	69	68
Days over 8-hour federal standard	75 ppb	0	0	0
Days over 8-hour state standard	70 ppb	0	0	0
3-year 8-hour average (ppmv)	—	51	53	56
Carbon Monoxide				
Maximum 1-hour average (ppm)	—	2.3	2.2	1.9
Maximum 8-hour average (ppm)	—	1.1	1.1	1.1
Days over 8-hour federal/state std.	9 ppm	0	0	0
Nitrogen Dioxide				
Maximum 1-hour average (ppb)	—	52	50	62
Annual average (ppb)	—	11	12	11
Days over 1-hour federal standard	100 ppb	0	0	0
Days over 1-hour state standard	180 ppb	0	0	0
PM_{10}				
Annual average ($\mu g/m^3$)	—	13.2	15.7	14.1
Maximum 24-hour average ($\mu g/m^3$)	—	37	54	41
Days over 24-hour federal standard	150 $\mu g/m^3$	0	0	0
Days over 24-hour state standard	50 $\mu g/m^3$	0	1	0
$PM_{2.5}$				
Maximum 24-hour average ($\mu g/m^3$)	—	26.5	44.9	38.1
Days over 24-hour federal standard	35 $\mu g/m^3$	0	2	1
3-year 24-hour average ($\mu g/m^3$)*	—	—	24	22
Annual average ($\mu g/m^3$)	—	8.0	10.8	10.8
Days over annual state standard	12 $\mu g/m^3$	0	0	0
3-year annual average ($\mu g/m^3$)*	—	—	9.6	9.8
Days over annual federal standard*	12 $\mu g/m^3$	—	0	0

Source: BAAQMD 2015b, CARB 2015b

Notes:

ppmv = parts per million by volume

$\mu g/m^3$ = micrograms per cubic meter

Sulfur dioxide (SO_2) not monitored at this site

* The $PM_{2.5}$ instrument at San Rafael was out of commission during July-August, 2010. Therefore, 3-year average $PM_{2.5}$ statistics are not available for 2012.

As shown in Table 3-3, ambient air quality in the Project Area is generally good, with few violations of state or federal ambient air quality standards. From 2012 to 2014 – the most recent three years of data available – there was only one violation of the state 24-hour PM_{10} standard, and only three violations of the federal 24-hour $PM_{2.5}$ standard. There were no violations of any other CAAQS or NAAQS in San Rafael during the 3-year period.

3.2.1 Pollutants of Concern During Project Construction

A project's construction phase produces many types of emissions, but PM_{10} (including $PM_{2.5}$) in fugitive dust and diesel engine exhaust are the pollutants of greatest concern. Fugitive dust emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle exhaust. Construction-related emissions can cause substantial increases in localized concentrations of PM_{10}, as well as affecting PM_{10} compliance with ambient air quality standards on a regional basis. Particulate emissions from construction activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces. The use of diesel-powered construction equipment emits ozone precursors NO_x and ROG, diesel total organic gases (DTOG), and diesel particulate matter (DPM), the latter two being composite TACs containing a variety of hazardous substances. Large construction projects using multiple large earthmoving equipment are evaluated to determine if operations may exceed the District's daily threshold for NO_x emissions and could temporarily expose area residents to hazardous levels of DTOG and DPM. Use of architectural coatings and other materials associated with finishing buildings may also emit ROG and TACs. CEQA significance thresholds address the impacts of construction activity emissions on local and regional air quality. Thresholds are also provided for other potential impacts related to project construction, such as odors and TACs.

The BAAQMD's approach to CEQA analyses of fugitive dust impacts is to require implementation of effective and comprehensive dust control measures rather than to require detailed quantification of emissions. PM_{10} emitted during construction can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors, making quantification difficult. Despite this variability in emissions, experience has shown that there are a number of feasible control measures that can be reasonably implemented to significantly reduce fugitive dust emissions from construction. The BAAQMD has determined that compliance with an approved fugitive dust control plan, primarily through frequent water application, constitutes sufficient mitigation to reduce PM_{10} impacts to a level considered less than significant.

3.2.2 Pollutants of Concern During Project Operation

The term "project operations" refers to the full range of activities that can or may generate pollutant emissions when the development is functioning in its intended use. For projects such as office parks, shopping centers, residential subdivisions, and other indirect sources, motor vehicles traveling to and from the project represents the primary source of air pollutant emissions. For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint. CEQA significance thresholds address the impacts of operational emission sources on local and regional air quality. Thresholds are also provided for other potential impacts related to project operations, such as odors and TACs.

Particular to this Project, since the POTW is an existing permitted stationary source of criteria air pollutants, TACs, and GHGs, only the net change in operational emissions, i.e., post-project minus pre-project, is evaluated for CEQA significance.

3.2.3 Air Quality Impacts of Project Construction

Table 3-4 shows estimated construction emissions as output by CalEEMod for the proposed Project. For assessment purposes, construction is assumed to occur in Phases 1, 2, and 3 during 2017, 2018, and 2019, respectively, and earliest possible full operation year would occur in 2020. Each construction Phase was individually estimated using CalEEMod, i.e., three sub-projects (see Appendices A and C). Table 3-5 evaluates estimated construction emission rates (maxima) against BAAQMD CEQA significance thresholds for Phases 1, 2, and 3 in aggregate.

Table 3-4: Estimated Criteria Emissions Summary – Construction

Criteria Pollutants	Maximum lbs/day	Total tons
ROG (VOC)	3.5	1.03
NO_x	24.9	7.08
CO	21.2	6.50
SO_x	0.03	0.01
Fugitive Dust PM_{10}	2.5	0.14
Exhaust PM_{10}	1.6	0.43
Total PM_{10}	3.7	0.57
Fugitive Dust $PM_{2.5}$	1.2	0.04
Exhaust $PM_{2.5}$	1.5	0.42
Total $PM_{2.5}$	2.4	0.45

Source: CalEEMod v2013.2.2

Table 3-5: Significance Thresholds Evaluation – Construction

Criteria Pollutants	Maximum lbs/day	Threshold lbs/day	Significance
Reactive Organic Gases (ROG)	3.5	54	LTS
Nitrogen Oxides (NO_x)	24.9	54	LTS
Sulfur Dioxide (SO_2)[1]	0.03	None	—
PM_{10} (exhaust)[2]	1.6	82	LTS
$PM_{2.5}$ (exhaust)[2]	1.5	54	LTS
PM_{10} / $PM_{2.5}$ (fugitive dust)[3]	2.5	BMPs	LTS
Local Carbon Monoxide (CO)	21.2	None	—

Source: BAAQMD 2011, CalEEMod v2013.2.2

Notes:

[1] Prevention of Significant Deterioration (PSD), annual only (not applicable to construction)

[2] Construction PM_{10} and $PM_{2.5}$ for engine exhaust only

[3] BMPs – Best Management Practices for control of fugitive dust

LTS – Less Than Significant

As shown in Table 3-5, all daily construction impacts would be less than significant without mitigation. As required by BAAQMD, fugitive dust controls – in the form of Best Management Practices (BMPs) – would further reduce generation of fugitive dust and hence local impacts in the vicinity of the Project. Also, while not mitigation per se (i.e., ministerial regulatory requirements), all painting materials purchased for the proposed Project would comply with BAAQMD Regulation 8, Rule 3: Architectural Coatings, which requires coating manufacturers to limit the VOC contents of products offered for sale within BAAQMD jurisdiction.

3.2.4 Air Quality Impacts of Project Operation

Table 3-6 shows the estimated net change, i.e., post-project minus pre-project, in stationary source operational emissions of ROG and TACs for the proposed Project. Appendix B contains waste water treatment EETs approved by the BAAQMD and other California air districts. Tables 3-7 and 3-8 evaluate the net changes in stationary source emission rates of ROG and TACs against BAAQMD CEQA significance thresholds. Since post-project worker commuting and logistics traffic would be about the same as pre-project levels, there would be no quantifiable net operational impacts from mobile sources, hence, less than significant.

Table 3-6: Estimated Emissions Summary – Net Operational Change

Criteria Pollutants & TACs	CAS No.	Maximum	Annual
		lbs/day	lbs/yr
Reactive Organic Gases (ROG)	43104	3.89	78.8
Chloroform	67663	0.98	20.0
Benzene	71432	0.09	1.8
Methyl Chloroform (1,1,1-TCA)	71556	2.71	55.0
Methylene Chloride	75092	2.34	47.5
Trichloroethylene (TCE)	79016	0.27	5.5
1,4-Dichlorobenzene	106467	0.13	2.5
Toluene	108883	0.69	14.0
Tetrachloroethylene (PERC)	127184	0.91	18.5
Xylenes	1330207	0.82	16.5

Source: Aqua 2015, BAAQMD 2013b

Table 3-7: Significance Thresholds Evaluation – Net Daily Operational Change

Criteria Pollutants & TACs	CAS No.	Maximum lbs/day	Threshold lbs/day	Significance
Reactive Organic Gases (ROG)	43104	3.89	54	LTS
Chloroform	67663	0.98	None	—
Benzene	71432	0.09	None	—
Methyl Chloroform (1,1,1-TCA)	71556	2.71	None	—
Methylene Chloride	75092	2.34	None	—
Trichloroethylene (TCE)	79016	0.27	None	—
1,4-Dichlorobenzene	106467	0.13	None	—
Toluene	108883	0.69	None	—
Tetrachloroethylene (PERC)	127184	0.91	None	—
Xylenes	1330207	0.82	None	—

Source: BAAQMD 2011, Aqua 2015, BAAQMD 2013b

Notes:

LTS – Less Than Significant

Table 3-8: Significance Thresholds Evaluation – Net Annual Operational Change

Criteria Pollutants & TACs	CAS No.	Annual lbs/yr	Threshold lbs/yr	Significance
Reactive Organic Gases (ROG)	43104	78.8	20,000	LTS
Chloroform	67663	20.0	20.0	LTS
Benzene	71432	1.8	3.8	LTS
Methyl Chloroform (1,1,1-TCA)	71556	55.0	39,000	LTS
Methylene Chloride	75092	47.5	110.0	LTS
Trichloroethylene (TCE)	79016	5.5	54.0	LTS
1,4-Dichlorobenzene	106467	2.5	9.50	LTS
Toluene	108883	14.0	12,000	LTS
Tetrachloroethylene (PERC)	127184	18.5	18.0	LTS*
Xylenes	1330207	16.5	27,000	LTS

Source: BAAQMD 2011, Aqua 2015, BAAQMD 2013b, BAAQMD Regulation 2, Rule 5, Table 1

Notes:

LTS – Less Than Significant

* No longer applicable and not a significant risk (see discussions)

As shown in Table 3-7, daily operational ROG impacts would be less than significant with respect to CEQA significance thresholds. Table 3-8 provides a comparison of TACs from the proposed project with BAAQMD Regulation 2, Rule 5, Table 1 – Toxic Air Contaminant Trigger Levels. These are levels below which BAAQMD will permit a project without a site specific risk assessment to determine that a project complies with BAAQMD's Regulation 2, Rule 5 for New Source Review of Toxic Air Contaminants. As shown in Table 3-8, all annual operational impacts of ROG and TACs would also be less than significant with respect to CEQA significance thresholds and BAAQMD's Toxic Air Contaminant Trigger Levels. The transient exception is tetrachloroethylene (perchloroethylene) which is no longer considered generally applicable. This is due the general phase-out of PERC as a common dry cleaning agent since the waste water treatment EETs (Appendix B) were initially developed by the EPA in the 1990s (BAAQMD 2013b). The phase-out of PERC, along with phase-outs of other chlorinated solvents (e.g., 1,1,1-TCA and TCE), have substantially reduced evaporative emissions of these substances from waste water treatment processes over the past two decades. In addition, the screening risk assessment presented in Section 3.4 demonstrates that notwithstanding such phase-outs, risks to nearby receptors would nevertheless be less than significant.

3.2.5 Proposed Mitigation Measures

MITIGATION MEASURE AQ-1: **BMPs for Construction Related Emissions.**

The following BMPs would be implemented as part of the Project so that all construction-related emissions, including fugitive dust, would result in less than significant impacts (BAAQMD 2011, 2010b):

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. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of CCR). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator if visible emissions are apparent to onsite construction staff.
8. A publicly visible sign shall be posted with the telephone number and 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 phone number shall also be visible to ensure compliance with applicable regulations.

With proposed mitigation measure AQ-1 incorporated (implemented), air quality impacts of the proposed Project construction would be less then significant.

3.3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project is non-attainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

SUMMARY OF IMPACT ANALYSIS: Mitigated fugitive dust emissions (see Section 3.2.5 above) would not exceed CEQA thresholds for construction of the proposed Project. As described in Section 3.2 above, all other Project-related emissions of criteria pollutants, including NO_x and ROG, would not exceed CEQA thresholds.

IMPACT: **Less Than Significant (LTS).**

Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Therefore, since temporary construction emissions and changes in operational emissions would be less than significant, the cumulative air quality impact would also be less than significant.

MITIGATION MEASURE: **AQ-1 (see Section 3.2.5 above).**

3.4 Expose sensitive receptors to substantial pollutant concentrations?

SUMMARY OF IMPACT ANALYSIS: A screening-level health risk assessment (SHRA) for DPM was performed to demonstrate that maximum risks to the nearest receptors (i.e., residents and workers) during Project construction would be below significance thresholds. Similarly, a SHRA was also performed for estimated absolute post-project operational emissions of TACs from the upgraded POTW. The results of both risk assessments, which are conservative, show that no unacceptable risks to nearby residents and workers would result from the proposed Project (see Appendices A and C).

IMPACT: **Less Than Significant (LTS).**

The Project site comprises a 7.35 acre parcel located at 300 Smith Ranch Road in San Rafael, California. No schools are in the vicinity of the proposed Project. The nearest receptors to the facility are institutional (worker) and residential:

- Worker: WildCare Silveira Ranch[3], 300 meters (980 feet) southwest
- Residential: McInnis Park Apartments, 600 meters (1,970 feet) southwest

The 2013 Census estimate population of San Rafael is 59,000 (SRC 2013). The land area of San Rafael is 16.47 square miles, which yields an average population density of about 3,580 persons per square mile (SRC 2013). Therefore, for cancer burden assessment purposes, the maximum population of the Project area is estimated to be about 4,340 persons within a conservative 1,000 meter (0.62 mile) radius of the Project site, although the actual population may be less. The active Project site area is 5 acres for both construction and operation with 2.35 acres undisturbed or inactive.

Any project with the potential to expose sensitive receptors (including residential areas) or the general public to substantial ambient levels of TACs would be deemed to have a potentially significant impact. This applies to receptors locating near existing sources of TACs, as well as TAC sources locating near existing receptors. Particular attention must be placed on either 1) the

[3] Formerly Helen Vine Detox Center.

location of a new facility that has the potential to emit TACs within 1,000 feet of an existing school, or 2) the location of a new school within 1,000 feet of an existing facility that has the potential to emit TACs. There are no schools located within 1,000 feet of the proposed Project.

The health risk calculations were performed using the Hotspots Analysis and Reporting Program Version 2 (HARP2) Risk Assessment Standalone Tool (RAST, version 16057). The ground-level concentration (GLC) input file format was calculated using the annual average and hourly maximum emission rates in units of grams per second (g/s) times the annual and hourly X/Q values predicted by AERSCREEN (version 15181). Risks associated with the volume source (i.e., active construction and operational area) were determined at the nearest receptor impact locations specified above. The approach is consistent with New Source Review (NSR) guidelines (BAAQMD 2010c). Local dispersion modeling parameters[4] are consistent with other projects in the San Francisco Bay Shoreline Area (URS 2008).

Proposed land use or stationary source projects that have the potential to expose the public to TAC risks in excess of the thresholds shown in Tables 3-9 and 3-10 would be considered to have a significant air quality impact. These thresholds are based on the BAAQMD CEQA Guidelines (BAAQMD 2011, 2010b).

3.4.1 Risks from Project Construction

The results of the construction SHRA summarized in Table 3-9 shows that MICR – Maximum Individual Cancer Risk – would be under the 10 in a million threshold for residents and workers over the 3-year construction period. The maximum noncancer chronic and acute hazard indices, HIC and HIA, respectively, would be under the unity (1) thresholds for residents and workers. Due to the short duration of earthmoving activities (i.e., site preparation and minor grading), the increase in annual average $PM_{2.5}$ concentration from fugitive dust during construction would be under the 0.3 $\mu g/m^3$ threshold for residents and workers. For information purposes, population cancer burden would be less than 0.5 cases. Therefore, risks from airborne TACs due to construction of the proposed Project would be less than significant for all receptors. For construction SHRA details, see Appendix A2 (OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016, BAAQMD 2011, BAAQMD 2010c).

<u>MITIGATION MEASURE</u>: **AQ-1 (see Section 3.2.5 above).**

3.4.2 Risks from Project Operation

The results of the operational SHRA summarized in Table 3-10 shows that MICR – Maximum Individual Cancer Risk – would be under the 10 in a million threshold for residents and workers over 30 and 25 year periods, respectively. The maximum noncancer chronic and acute hazard indices, HIC and HIA, respectively, would be under the unity (1) thresholds for residents and workers. For information purposes, population cancer burden would be less than 0.5 cases. Therefore, risks from airborne TACs due to operation of the proposed Project would be less than significant for all receptors. For operation SHRA details, see Appendix A3 (OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016, BAAQMD 2011, BAAQMD 2010c).

[4] Albedo (0.16); Bowen Ratio (0.86); Surface Roughness Length (0.42)

MITIGATION MEASURES: **None Required.**

Table 3-9: Screening HRA Results for Project Construction

Time and Age Weighted Toxic Air Contaminants Risks	AERSCREEN/HARP2 Screening Results			
	Risk	Per million	Threshold	Significance
Residential MICR – Multipathway	2.1E-08	0.02	10	PASS
Residential HIC	1.9E-04	—	1	PASS
Residential HIA	0	—	1	PASS
Residential Annual $PM_{2.5}$ ($\mu g/m^3$)	1.2E-06	—	0.3	PASS
Worker MICR – Multipathway	4.3E-10	0.0004	10	PASS
Worker HIC	1.9E-04	—	1	PASS
Worker HIA	0	—	1	PASS
Worker Annual $PM_{2.5}$ ($\mu g/m^3$)	2.9E-06	—	0.3	PASS
Population Cancer Burden	9.2E-05	—	0.5	PASS

Sources: OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016, BAAQMD 2011

Notes:

MICR – Maximum Individual Cancer Risk

HIC – Chronic Hazard Index

HIA – Acute Hazard Index

PASS – Less Than Significant

Tier 1 Screen:

OEHHA derived method (default)

Exposure period = 3 years (duration of construction project)

Residential Mandatory Minimum Multipathway (MP): inhalation, soil ingestion, dermal, mother's milk

Worker Multipathway (MP): inhalation, soil ingestion, dermal

Deposition rate: 0.05 m/s (default)

Table 3-10: Screening HRA Results for Project Operation

Time and Age Weighted Toxic Air Contaminants Risks	AERSCREEN/HARP2 Screening Results			
	Risk	Per million	Threshold	Significance
Residential MICR – Multipathway	1.8E-07	0.18	10	PASS
Residential HIC	8.6E-03	—	1	PASS
Residential HIA	4.5E-03	—	1	PASS
Worker MICR – Multipathway	3.2E-08	0.032	10	PASS
Worker HIC	2.2E-02	—	1	PASS
Worker HIA	1.1E-02	—	1	PASS
Population Cancer Burden	7.6E-04	—	0.5	PASS

Sources: OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016, BAAQMD 2011

Notes:

MICR – Maximum Individual Cancer Risk

HIC – Chronic Hazard Index

HIA – Acute Hazard Index

PASS – Less Than Significant

Tier 1 Screen:
OEHHA derived method (default)
Exposure period = 30 years resident; 25 years worker (defaults)
Residential Mandatory Minimum Multipathway (MP): inhalation, soil ingestion, dermal, mother's milk
Worker Multipathway (MP): inhalation, soil ingestion, dermal
Deposition rate: 0.05 m/s (default)

3.5 Create objectionable odors affecting a substantial number of people?

SUMMARY OF IMPACT ANALYSIS: Due to the features of the secondary treatment upgrade – which includes odor controls – the proposed Project is not expected to create objectionable odors at the residential and worker receptors described in Section 3.4 above. Therefore, the impact would be less than significant.

IMPACT: **Less Than Significant (LTS).**

While odors rarely cause any physical harm, they can be unpleasant, often generating citizen complaints to local governments and the BAAQMD. Any project with the potential to frequently expose the public to objectionable odors in violation of Regulation 1, Rule 301: Nuisance and Regulation 7: Odorous Substances[5] would be deemed to have a significant impact. Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. Specifically, Rule 301 states that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30-day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct."

The improved POTW is not expected to create objectionable odors at the nearest residential and worker receptors. Therefore, the impact would be less than significant.

MITIGATION MEASURES: **None Required.**

3.6 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

SUMMARY OF IMPACT ANALYSIS: Direct onsite and offsite GHG emissions were estimated for construction of the proposed Project. Ongoing operation of the upgraded POTW would result in approximately the same – or just slightly greater – level of direct and indirect GHG emissions as the existing facility, therefore, there would be no substantial net impacts from Project operation, hence, less than significant. However, as applicable to new construction, the proposed Project would be required to comply with Title 24 energy conservation mandates (see Section 3.7 below).

IMPACT: **Less Than Significant (LTS).**

[5] Establishes general limitations on odorous substances and specific emission limitations on certain odorous compounds.

Greenhouse gases – primarily carbon dioxide, methane, and nitrous oxide collectively reported as carbon dioxide equivalents (CO_2e) – are directly emitted as a result of stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as onroad vehicles and offroad construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (CARB 2008).

No GHG thresholds apply to construction activities. As shown in Table 3-11 below, the proposed Project would cause to be emitted about 870 MT of CO_2e during construction. The BAAQMD industrial facility GHG threshold of 10,000 metric tonnes (MT) per year would apply to the proposed Project with respect to the net operational change. Referring to Table 3-8, if the net change in ROG emissions of 79 pounds per year is treated as methane (CH_4), which has a Global Warming Potential (GWP) of 25 (EPA 2016)[6], then the apparent net change attributable to POTW processes would be less than one metric ton per year of CO_2e, which is less than significant. The aggregate GHG impact of construction and operation of the proposed Project would be less than significant (BAAQMD 2011, 2010b).

MITIGATION MEASURES: **None Required.**

Table 3-11: Estimated GHG Emissions Summary – Construction

Greenhouse Gases	Maximum lbs/day	Total MT
Biogenic CO_2	0.0	0.00
Non-Biogenic CO_2	3,044	867
Total CO_2	3,044	867
CH_4	0.8	0.16
N_2O	0.0	0.00
CO_2e	3,060	870

Source: CalEEMod v2013.2.2

3.7 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

SUMMARY OF IMPACT ANALYSIS: The proposed Project would be required to comply with all building codes in effect at the time of construction which include energy conservation measures mandated by Title 24 of the California Building Standards Code – Energy Efficiency Standards.

IMPACT: **Less Than Significant (LTS).**

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2013 standards improved upon the 2008 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2013 standards went into effect on July 1, 2014. The 2016 standards currently in draft form (released June 2015)

[6] POTW process CO_2e = (79 lbs/yr as CH_4 x 25) / 2,204.6 lbs/MT = 0.9 MT/yr CO_2e.

will further improve upon the 2013 standards for all types of buildings. The final 2016 standards will go into effect on January 1, 2017 (CEC 2016).

Since the Title 24 standards require energy conservation features in new construction (e.g., high-efficiency electric motors, high-efficiency lighting, high-efficiency heating, ventilating, and air-conditioning (HVAC) systems, thermal insulation, double-glazed windows, water conserving plumbing fixtures, etc.), they indirectly regulate and reduce GHG emissions. Therefore, the Project will not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases and the impact would be less than significant.

MITIGATION MEASURES: **None Required.**

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5.0 REPORT AUTHORS

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APPENDIX A – SUMMARY AND RISK SPREADSHEETS

CEQA Land Use Project - Air Quality / Greenhouse Gas Report

Project Name:	Las Gallinas Valley Sanitary District Secondary Treatment Upgrade
Client Name:	Albert A. Webb Associates
Mailing Address:	3788 McCray Street, Riverside, CA 92506
Contact(s):	Jillian M. Feyk-Miney
Telephone(s):	(951) 320-6057
E-mail(s):	jillian.feyk-miney@webbassociates.com
Facility Owner/Operator:	Las Gallinas Valley Sanitary District
Mailing Address:	300 Smith Ranch Road, San Rafael, CA 94903
Facility Name:	Las Gallinas Valley Sanitary District
Source Description:	Publically Owned Treatment Works (POTW)
Facility Permit ID:	
Facility Address:	300 Smith Ranch Road, San Rafael, CA 94903
Latitude, North:	38.025472°
Longitude, West:	-122.519695°
Elevation, feet ASL:	10
Author:	Bradford Boyes, Carla Jo
Peer Reviewer:	Greg Wolffe, Mike Dudasko
Date:	

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CEQA Appendix G Significance Summary

Significance Criteria	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Air Quality. Where available, the significance criteria established by the applicable air quality management or				
a) Conflict with or obstruct implementation of the applicable air quality plan?			▲	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			▲	
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			▲	
d) Expose sensitive receptors to substantial pollutant concentrations?			▲	
e) Create objectionable odors affecting a substantial number of people?			▲	
Greenhouse Gases. Would the project:				
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 gases?			▲	

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Land Use Data for CalEEMod Input - Las Gallinas Valley Sanitary District (Marin Co.) - Phase 1 (2017)

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet	Pop.
Built Structures	Industrial	General Light Industry	9.900	1000 sf	0.227	9,900	0
Roadways & Parking Spaces	Parking	Other Asphalt Surfaces	—	1000 sf	—	—	0
Other Graded or Paved Surfaces	Parking	Other Non-Asphalt Surfaces	40.733	1000 sf	0.935	40,733	0
Undisturbed Areas	—	—	34.100	1000 sf	0.783	34,100	0
Parcel Totals					**1.95**	**84,733**	**0**

Source: Webb 2016

Land Use Data for CalEEMod Input - Las Gallinas Valley Sanitary District (Marin Co.) - Phase 2 (2018)

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet	Pop.
Built Structures	Industrial	General Light Industry	20.000	1000 sf	0.459	20,000	0
Roadways & Parking Spaces	Parking	Other Asphalt Surfaces	25.000	1000 sf	0.574	25,000	0
Other Graded or Paved Surfaces	Parking	Other Non-Asphalt Surfaces	44.333	1000 sf	1.018	44,333	0
Undisturbed Areas	—	—	34.100	1000 sf	0.783	34,100	0
Parcel Totals					**2.83**	**123,433**	**0**

Source: Webb 2016

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Land Use Data for CalEEMod Input - Las Gallinas Valley Sanitary District (Marin Co.) - Phase 3 (2019)

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet	Pop.
Built Structures	Industrial	General Light Industry	33.500	1000 sf	0.769	33,500	0
Roadways & Parking Spaces	Parking	Other Asphalt Surfaces	—	1000 sf	—	—	0
Other Graded or Paved Surfaces	Parking	Other Non-Asphalt Surfaces	44.333	1000 sf	1.018	44,333	0
Undisturbed Areas	—	—	34.100	1000 sf	0.783	34,100	0
Parcel Totals					**2.57**	**111,933**	**0**

Source: Webb 2016

Land Use Data for CalEEMod Input - Las Gallinas Valley Sanitary District (Marin Co.) - All Phases Summary

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet	Pop.
Built Structures	Industrial	General Light Industry	63.400	1000 sf	1.455	63,400	0
Roadways & Parking Spaces	Parking	Other Asphalt Surfaces	25.000	1000 sf	0.574	25,000	0
Other Graded or Paved Surfaces	Parking	Other Non-Asphalt Surfaces	129.400	1000 sf	2.971	129,400	0
Undisturbed Areas	—	—	102.300	1000 sf	2.348	102,300	0
Parcel Totals					**7.35**	**320,100**	**0**

Source: Webb 2016

Notes:

Estimated total site area =	7.35	acres (parcel)
Estimated project active area =	5.00	acres
Estimated undisturbed area =	2.35	acres
Estimated project active area =	68%	of total site area
Estimated undisturbed area =	32%	of total site area

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CalEEMod Construction Schedule - Estimated Project Plan

Phase 1 Name/Type	Estimated Start Date	Estimated End Date	Working Days per Week	Total Working Days	Allotted Weeks
Demolition	1/1/2017	1/27/2017	5	20	4
Site Preparation	1/28/2017	1/31/2017	5	2	0.4
Grading	2/1/2017	2/6/2017	5	4	0.8
Building Construction	2/7/2017	11/13/2017	5	200	40
Total Phase	**1/1/2017**	**11/13/2017**	**5**	**226**	**45**

Phase 2 Name/Type	Estimated Start Date	Estimated End Date	Working Days per Week	Total Working Days	Allotted Weeks
Demolition	1/1/2018	1/27/2018	5	20	4
Site Preparation	1/28/2018	2/1/2018	5	4	0.8
Grading	2/2/2018	2/9/2018	5	6	1.2
Building Construction	2/10/2018	12/14/2018	5	220	44
Paving	12/15/2018	12/28/2018	5	10	2
Total Phase	**1/1/2018**	**12/28/2018**	**5**	**260**	**52**

Phase 3 Name/Type	Estimated Start Date	Estimated End Date	Working Days per Week	Total Working Days	Allotted Weeks
Demolition	1/1/2019	1/27/2019	5	19	3.8
Site Preparation	1/28/2019	1/29/2019	5	2	0.4
Grading	2/1/2019	2/6/2019	5	4	0.8
Building Construction	2/7/2019	11/13/2019	5	200	40
Total Phase	**1/1/2019**	**11/13/2019**	**5**	**225**	**45**

CalEEMod Construction Schedule - Estimated Project Plan

Phase 1A – Phase 1A will include the preparatory work required for the remaining work to proceed, including temporary items required to meet permit conditions during the construction. Phase 1A includes the following:

- Demolition of primary trickling filter rock media and modification of distributor (non-discharge season)
- Installation of temporary plastic media in primary trickling filter (non-discharge season)
- Demolition and grading of lagoon area
- Construction of new lab facility
- Demolition and reconstruction of administration building
- Recycled Water Facility Expansion
- Realignment of overhead power
- Modifications to CCB influent box and to CCB
- Construct RAS/WAS Structure
- RAS/WAS Thickening Facility

Phase 1B – This phase includes the items that cannot be done until the Phase 1A items are complete.

- Demolition of MMWD facility
- Demolition of existing lab
- Realignment of plant road

Phase 2 – Once the primary trickling filter has been modified as part of Phase 1 and is completely started back up and fully functioning, Phase 2 work can begin, including the following:

- Demolition of secondary trickling filter
- Construct of STM Aerator Basins
- Construct Primary Pump Station
- Construct Secondary Clarifier No 2

Phase 3 – Once the STM Aerator process and primary pump station are installed, started up, and completely functional the phase 3 work can commence as follows:

- Demolition of nitrification tower (bid alternate)
- Demolition of primary trickling filter
- Modification of Clarifier No 1
- Construction of Clarifier No 3 (bid alternate)
- Construction of Anaerobic and Anoxic Basins
- Construction of Equalization Basin

Attainment Status - San Francisco Bay Area Air Basin

Criteria Pollutants	Averaging Time	State Designation	Federal Designation
Ozone (O_3)	1-hour	Nonattainment	—
	8-hour	Nonattainment	Nonattainment[1]
Nitrogen Dioxide (NO_2)	1-hour	Attainment	Unclassified[2]
	Annual	Attainment	Attainment
Sulfur Dioxide (SO_2)	All	Attainment	Attainment
Carbon Monoxide (CO)	All	Attainment	Attainment
Respirable Particulates (as PM_{10})	24-hour	Nonattainment	Unclassified[2]
	Annual	Nonattainment	—
Fine Particulates (as $PM_{2.5}$)	24-hour	—	Nonattainment
	Annual	Nonattainment	Unclassified/Attainment
Lead (Pb)	All	Attainment	Attainment
Sulfates (as SO_4)	24-hour	Attainment	—
Hydrogen Sulfide (H_2S)	1-hour	Unclassified[2]	—
Vinyl Chloride (C_2H_3Cl)	24-hour	n/d	—
Visibility	8-hour	Unclassified[2]	—

Source: BAAQMD 2015a, CARB 2015a, EPA 2015a

Notes:

[1] The 0.08 ppmv federal 8-hour ozone standard applied until 2008; 0.075 ppmv until October 1, 2015

[2] At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassified.

n/d - no data/information available

Ambient Air Quality Standards

Criteria Pollutants	Averaging Time	California Standards		Federal Standards	
		ppmv	µg/m³	ppmv	µg/m³
Ozone (O_3)	1-hour	0.09	177	—	—
	8-hour	0.07	137	0.070	137
Nitrogen Dioxide (NO_2)	1-hour	0.18	338	0.100	188
	Annual	0.03	56	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	655	0.075	196
	3-hour Secondary	—	—	0.50	1,309
	24-hour	0.04	105	0.14	367
	Annual	—	—	0.03	79
Carbon Monoxide (CO)	1-hour	20	22,898	35	40,071
	8-hour	9	10,304	9	10,304
	Lake Tahoe (8-hr)	6	6,869	—	—
Particulates (as PM_{10})	24-hour	—	50	—	150
	Annual	—	20	—	—
Particulates (as $PM_{2.5}$)	24-hour	—	—	—	35
	Annual Primary	—	12	—	12
	Annual Secondary	—	—	—	15
Lead (Pb)	30-day	—	1.5	—	—
	3-month (rolling)	—	—	—	0.15
Sulfates (as SO_4)	24-hour	—	25	—	—
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	—	—
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01	26	—	—
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per km; visibility of 10 miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70%.		—	—

Source: CARB 2015b

Notes:

ppmv = parts per million by volume

µg/m³ = micrograms per cubic meter

The 1.5 µg/m³ federal quarterly lead standard applied until 2008; 0.15 µg/m³ rolling 3-month average thereafter

For gases, ug/m³ calculated from ppmv based on molecular weight and standard conditions:

Standard Temperature	25	°C for ambient air monitoring
Standard Molar Volume	24.465	liter/g-mole for ambient air monitoring

Air Quality Data Summary for the Project Area - San Rafael

Criteria Pollutants	Applicable Standard	Monitoring Data by Year		
		2012	2013	2014
Ozone				
Maximum 1-hour average (ppb)	—	76	81	88
Days over 1-hour state standard	90 ppb	0	0	0
Maximum 8-hour average (ppb)	—	57	69	68
Days over 8-hour federal standard	75 ppb	0	0	0
Days over 8-hour state standard	70 ppb	0	0	0
3-year 8-hour average (ppmv)	—	51	53	56
Carbon Monoxide				
Maximum 1-hour average (ppm)	—	2.3	2.2	1.9
Maximum 8-hour average (ppm)	—	1.1	1.1	1.1
Days over 8-hour federal/state std.	9 ppm	0	0	0
Nitrogen Dioxide				
Maximum 1-hour average (ppb)	—	52	50	62
Annual average (ppb)	—	11	12	11
Days over 1-hour federal standard	100 ppb	0	0	0
Days over 1-hour state standard	180 ppb	0	0	0
Sulfur Dioxide (not monitored at this site)				
Maximum 1-hour average (ppb)	—	—	—	—
Maximum 24-hour average (ppb)	—	—	—	—
Days over 1-hour federal standard	75 ppb	—	—	—
Days over 24-hour state standard	40 ppb	—	—	—
PM_{10}				
Annual average (μg/m^3)	—	13.2	15.7	14.1
Maximum 24-hour average (μg/m^3)	—	37	54	41
Days over 24-hour federal standard	150 μg/m^3	0	0	0
Days over 24-hour state standard	50 μg/m^3	0	1	0
$PM_{2.5}$				
Maximum 24-hour average (μg/m^3)	—	26.5	44.9	38.1
Days over 24-hour federal standard	35 μg/m^3	0	2	1
3-year 24-hour average (μg/m^3)*	—	—	24	22
Annual average (μg/m^3)	—	8.0	10.8	10.8
Days over annual state standard	12 μg/m^3	0	0	0
3-year annual average (μg/m^3)*	—	—	9.6	9.8
Days over annual federal standard*	12 μg/m^3	—	0	0

Source: BAAQMD 2015b, CARB 2015b

Notes:

ppmv = parts per million by volume

μg/m^3 = micrograms per cubic meter

* The $PM_{2.5}$ instrument at San Rafael was out of commission during July-August, 2010. Therefore, 3-year average $PM_{2.5}$ statistics are not available for 2012.

BAAQMD Proposed CEQA Thresholds of Significance (2010/2011)[1a, 1b, 1c]

Criteria Pollutants, Precursors, GHGs, Risks and Odors	Construction	Operation	
	lbs/day	lbs/day	tons/yr
Reactive Organic Gases (ROG)	54	54	10
Nitrogen Oxides (NO_X)	54	54	10
Sulfur Dioxide (SO_2)[2]	None	None	40
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10
PM_{10} / $PM_{2.5}$ (fugitive dust)[3]	BMPs	None	
Local Carbon Monoxide (CO)[4]	None	CAAQS: 9 ppmv (8-hr); 20 ppmv (1-hr)	
GHGs - Stationary Sources	None	10,000 MT CO_2e/year	
GHGs - Other than Stationary Sources	None	Compliance with GHG Reduction Strategy OR 1,100 MT of CO_2e/yr OR 4.6 MT CO_2e/SP/yr (res + emp)	
Risks & Hazards (individual project)	Compliance with Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million; Increased non-cancer risk of >1.0 Hazard Index (Chronic or Acute); Ambient $PM_{2.5}$ increase: >0.3 µg/m^3 annual average		
Risks & Hazards (cumulative threshold)	Compliance with Community Risk Reduction Plan OR Increased cancer risk of >100.0 in a million; Increased non-cancer risk of >10.0 Hazard Index (Chronic or Acute); Ambient $PM_{2.5}$ increase: >0.8 µg/m^3 annual average		
Accidental Release of Acutely Hazardous Air Pollutants/Materials	None	Storage or use of acutely hazardous materials located near receptors or new receptors locating near stored or used AHMs are considered significant	
Odors	None	5 confirmed complaints per year averaged over 3 years	

Source: BAAQMD 2011 (see notes 1a,b,c), 40 CFR 51.166 (see note 2)

Notes:

[1a] On March 5, 2012 the Alameda County Superior Court issued a judgment finding that the Air District had failed to comply with CEQA when it adopted the Thresholds. The court did not determine whether the Thresholds were valid on the merits, but found that the adoption of the Thresholds was a project under CEQA. The court issued a writ of mandate ordering the District to set aside the Thresholds and cease dissemination of them until the Air District had complied with CEQA. The Air District has appealed the Alameda County Superior Court's decision. The Court of Appeal of the State of California, First Appellate District, reversed the trial court's decision. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review, and the matter is currently pending there.

[1b] Due to the March 5, 2012 writ of mandate which set aside the Air District's adopted 2010 CEQA Thresholds of Significance, the Air District cannot recommend specific thresholds of significance for use by local governments at this time (September 2014). Lead agencies will need to determine appropriate air quality thresholds to use for each project they review based on substantial evidence that they should include in the administrative record for the project. Lead agencies should examine the substantial evidence in determining appropriate air quality thresholds. Lead agencies may reference the Air District's 1999 Thresholds of Significance. Lead agencies may also reference the Air District's CEQA Thresholds Options and Justification Report developed by staff in 2009. The CEQA Thresholds Options and Justification Report, outlines substantial evidence supporting a variety of thresholds of significance. In accordance with the court order referenced above, the Air District cannot and does not endorse or recommend any of the particular thresholds outlined therein.

[1c] At the request of the Lead Agency, the air quality and GHG analysis follows the 2010/2011 draft significance thresholds. This is because the Lead Agency has determined that Appendix D of the guidelines, in combination with BAAQMD's Revised Draft Options and Justification Report (BAAQMD 2009), provides substantial evidence to support the 2010 significance thresholds and, therefore, has determined they are appropriate for use in this analysis in lieu of the 1999 significance thresholds.

[2] Prevention of Significant Deterioration (PSD), annual only

[3] BMPs - Best Management Practices for control of fugitive dust

[4] Not to exceed California Ambient Air Quality Standards for CO

Estimated Emissions Summary - Construction

Criteria Pollutants	Maximum	Total
	lbs/day	tons
ROG (VOC)	3.5	1.03
NO_X	24.9	7.08
CO	21.2	6.50
SO_X	0.03	0.01
Fugitive Dust PM_{10}	2.5	0.14
Exhaust PM_{10}	1.6	0.43
Total PM_{10}	3.7	0.57
Fugitive Dust $PM_{2.5}$	1.2	0.04
Exhaust $PM_{2.5}$	1.5	0.42
Total $PM_{2.5}$	2.4	0.45

Source: CalEEMod v2013.2.2

Greenhouse Gases	Maximum	Total
	lbs/day	MT
Biogenic CO_2	0.0	0.00
Non-Biogenic CO_2	3,044	867
Total CO_2	3,044	867
CH_4	0.8	0.16
N_2O	0.0	0.00
CO_2e	3,060	870

Source: CalEEMod v2013.2.2

Air Quality Significance Thresholds Evaluation - Construction

Criteria Pollutants & GHGs	Maximum	Threshold	Significance
	lbs/day	lbs/day	
Reactive Organic Gases (ROG)	3.5	54	LTS
Nitrogen Oxides (NO_X)	24.9	54	LTS
Sulfur Dioxide (SO_2)[1]	0.03	None	—
PM_{10} (exhaust)[2]	1.6	82	LTS
$PM_{2.5}$ (exhaust)[2]	1.5	54	LTS
PM_{10} / $PM_{2.5}$ (fugitive dust)[3]	2.5	BMPs	LTS
Local Carbon Monoxide (CO)	21.2	None	—
GHGs - Other Non-Stationary	3,060	None	—

Source: BAAQMD 2011, CalEEMod v2013.2.2

Notes:

[1] Prevention of Significant Deterioration (PSD), annual only (not applicable to construction)

[2] Construction PM_{10} and $PM_{2.5}$ for engine exhaust only

[3] BMPs - Best Management Practices for control of fugitive dust

LTS - Less Than Significant

Estimated Emissions Summary - Net Operational Change

Criteria Pollutants & TACs	CAS No.	Maximum	Annual
		lbs/day	lbs/yr
Reactive Organic Gases (ROG)	43104	3.89	78.8
Chloroform	67663	0.98	20.0
Benzene	71432	0.09	1.8
Methyl Chloroform (1,1,1-TCA)	71556	2.71	55.0
Methylene Chloride	75092	2.34	47.5
Trichloroethylene (TCE)	79016	0.27	5.5
1,4-Dichlorobenzene	106467	0.13	2.5
Toluene	108883	0.69	14.0
Tetrachloroethylene (PERC)	127184	0.91	18.5
Xylenes	1330207	0.82	16.5

Source: Aqua 2015, BAAQMD 2013b

Air Quality Significance Thresholds Evaluation - Net Daily Operational Change

Criteria Pollutants & TACs	CAS No.	Maximum	Threshold	Significance
		lbs/day	lbs/day	
Reactive Organic Gases (ROG)	43104	3.89	54	LTS
Chloroform	67663	0.98	None	—
Benzene	71432	0.09	None	—
Methyl Chloroform (1,1,1-TCA)	71556	2.71	None	—
Methylene Chloride	75092	2.34	None	—
Trichloroethylene (TCE)	79016	0.27	None	—
1,4-Dichlorobenzene	106467	0.13	None	—
Toluene	108883	0.69	None	—
Tetrachloroethylene (PERC)	127184	0.91	None	—
Xylenes	1330207	0.82	None	—

Source: BAAQMD 2011, Aqua 2015, BAAQMD 2013b

Notes:

LTS - Less Than Significant

Air Quality Significance Thresholds Evaluation - Net Annual Operational Change

Criteria Pollutants & TACs	CAS No.	Annual lbs/yr	Threshold lbs/yr	Significance
Reactive Organic Gases (ROG)	43104	78.8	20,000	LTS
Chloroform	67663	20.0	20.0	LTS
Benzene	71432	1.8	3.8	LTS
Methyl Chloroform (1,1,1-TCA)	71556	55.0	39,000	LTS
Methylene Chloride	75092	47.5	110.0	LTS
Trichloroethylene (TCE)	79016	5.5	54.0	LTS
1,4-Dichlorobenzene	106467	2.5	9.50	LTS
Toluene	108883	14.0	12,000	LTS
Tetrachloroethylene (PERC)	127184	18.5	18.0	LTS*
Xylenes	1330207	16.5	27,000	LTS

Source: BAAQMD 2011, Aqua 2015, BAAQMD 2013b, BAAQMD Regulation 2, Rule 5, Table 1

Notes:

LTS - Less Than Significant

* no longer applicable and not a significant risk (see discussions)

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CalEEMod Estimated Construction Emissions for Proposed Project - Daily Maxima (Winter)

Year	ROG	NO_X	CO	SO_2	Fugitive PM_{10}	Exhaust PM_{10}	Total PM_{10}	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	Bio CO_2	NBio CO_2	Total CO_2	CH_4	N_2O	CO_2e
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Unmitigated Construction																
2017	3.53	24.25	19.97	0.03	5.94	1.55	7.24	2.98	1.48	4.18	0.00	2,772.42	2,772.42	0.55	0.00	2,783.99
2018	3.22	24.94	21.18	0.03	1.24	1.33	2.32	0.49	1.27	1.50	0.00	3,044.31	3,044.31	0.76	0.00	3,060.32
2019	2.51	22.29	20.41	0.03	6.29	1.22	7.32	3.02	1.14	3.96	0.00	2,681.47	2,681.47	0.62	0.00	2,694.47
Peaks	**3.53**	**24.94**	**21.18**	**0.03**	**6.29**	**1.55**	**7.32**	**3.02**	**1.48**	**4.18**	**0.00**	**3,044.31**	**3,044.31**	**0.76**	**0.00**	**3,060.32**
Mitigated Construction																
2017	3.53	24.25	19.97	0.03	2.34	1.55	3.65	1.17	1.48	2.37	0.00	2,772.42	2,772.42	0.55	0.00	2,783.99
2018	3.22	24.94	21.18	0.03	0.56	1.33	1.79	0.21	1.27	1.39	0.00	3,044.31	3,044.31	0.76	0.00	3,060.32
2019	2.51	22.29	20.41	0.03	2.50	1.22	3.53	1.19	1.14	2.13	0.00	2,681.47	2,681.47	0.62	0.00	2,694.47
Peaks	**3.53**	**24.94**	**21.18**	**0.03**	**2.50**	**1.55**	**3.65**	**1.19**	**1.48**	**2.37**	**0.00**	**3,044.31**	**3,044.31**	**0.76**	**0.00**	**3,060.32**
Mitigation Reductions																
Peaks					**3.79**		**3.67**	**1.83**		**1.81**						
Percent					**60%**		**50%**	**61%**		**43%**						

Source: CalEEMod v2013.2.2

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CalEEMod Estimated Construction Emissions for Proposed Project - Annual Totals

Year	ROG	NO_X	CO	SO_2	Fugitive PM_{10}	Exhaust PM_{10}	Total PM_{10}	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	Bio CO_2	NBio CO_2	Total CO_2	CH_4	N_2O	CO_2e
	tons	tons	tons	tons	tons	tons	tons	tons	tons	tons	MT	MT	MT	MT	MT	MT
Unmitigated Construction																
2017	0.37	2.50	2.12	0.00	0.05	0.17	0.21	0.01	0.16	0.17	0.00	271.45	271.45	0.05	0.00	272.57
2018	0.38	2.63	2.50	0.00	0.06	0.16	0.23	0.02	0.15	0.17	0.00	335.29	335.29	0.06	0.00	336.55
2019	0.28	1.96	1.87	0.00	0.06	0.11	0.17	0.02	0.10	0.12	0.00	260.31	260.31	0.04	0.00	261.21
Sums	**1.03**	**7.08**	**6.50**	**0.01**	**0.17**	**0.43**	**0.61**	**0.05**	**0.42**	**0.46**	**0.00**	**867.05**	**867.05**	**0.16**	**0.00**	**870.33**
Mitigated Construction																
2017	0.37	2.50	2.12	0.00	0.03	0.17	0.20	0.01	0.16	0.17	0.00	271.45	271.45	0.05	0.00	272.57
2018	0.38	2.63	2.50	0.00	0.06	0.16	0.22	0.02	0.15	0.17	0.00	335.29	335.29	0.06	0.00	336.55
2019	0.28	1.96	1.87	0.00	0.05	0.11	0.16	0.01	0.10	0.12	0.00	260.31	260.31	0.04	0.00	261.21
Sums	**1.03**	**7.08**	**6.50**	**0.01**	**0.14**	**0.43**	**0.57**	**0.04**	**0.42**	**0.45**	**0.00**	**867.05**	**867.05**	**0.16**	**0.00**	**870.33**
Mitigation Reductions																
Peaks					**0.03**		**0.04**	**0.01**		**0.01**						
Percent					**18%**		**7%**	**20%**		**2%**						

Source: CalEEMod v2013.2.2

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Surface Area Scaling Worksheet - Estimates

Parameters - Parcel	Form	Dim A	Dim B	Scaler	Dim A	Dim B	Area	
		mm	mm	ft/mm	ft	ft	ft^2	acres
Polygon A	Rect.	55	147	5	275	735	202,130	4.640
Polygon B	Rect.	21	30	5	105	150	15,750	0.362
Polygon C	Rect.	72	36	5	360	180	64,800	1.488
Polygon D	Tri.	21	52	5	105	260	13,650	0.313
Polygon E	Tri.	12	55	5	60	275	8,250	0.189
Polygon F	Tri.	17	73	5	85	365	15,510	0.356
Total site land area							**320,100**	**7.348**

Parameters - Constructions	Phase	Dim A	Dim B	Scaler	Dim A	Dim B	Area	
		mm	mm	ft/mm	ft	ft	ft^2	acres
Lab building	1	8	5	5	40	25	1,000	0.023
RAS/WAS sludge thickener (circular)	1	6	—	5	30	—	710	0.016
Administration building	1	12	12	5	60	60	3,600	0.083
Primary pump station	2	7	7	5	35	35	1,230	0.028
Aeration basins	2	18	23	5	90	115	10,350	0.238
Anaerobic & anoxic basins	3	15	23	5	75	115	8,630	0.198
Equalization basin	3	16	23	5	80	115	9,200	0.211
UV disinfection	1	6	5	5	30	25	750	0.017
Recycle process building	1	20	7	5	100	35	3,500	0.080
Secondary clarifier effluent box	2	4	3	5	20	15	300	0.007
Supernatant pump station	2	4	3	5	20	15	300	0.007
RAS/WAS structure	1	4	3	5	20	15	300	0.007
Secondary clarifier #1 (circular)	3	20	—	5	100	—	7,850	0.180
Secondary clarifier #2 (circular)	2	20	—	5	100	—	7,850	0.180
Secondary clarifier #3 (circular)	3	20	—	5	100	—	7,850	0.180
Phase	*1*						*9,900*	*0.227*
Phase	*2*						*20,000*	*0.459*
Phase	*3*						*33,500*	*0.769*
Built structures total area							**63,400**	**1.455**

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Surface Area Scaling Worksheet - Estimates

Parameters - Areas	Phase	Dim A	Dim B	Scaler	Dim A	Dim B	Area	
		mm	mm	ft/mm	ft	ft	ft^2	acres
Roadways & parking spaces	2	5	200	5	25	1000	25,000	0.574
Other graded or paved surfaces	1,2,3	—	—	—	—	—	129,400	2.971
Undisturbed areas	1,2,3	—	—	—	—	—	102,300	2.348
Total site land area (built+road/park+other+undisturbed)							**320,100**	**7.348**
Other graded or paved surfaces (Phase 1)							*40,733*	*0.935*
Other graded or paved surfaces (Phase 2)							*44,333*	*1.018*
Other graded or paved surfaces (Phase 3)							*44,333*	*1.018*
Undisturbed areas (each Phase 1, 2, 3)							*34,100*	*0.783*

Parameters - Demolitions	Phase	Dim A	Dim B	Scaler	Dim A	Dim B	Area	
		mm	mm	ft/mm	ft	ft	ft^2	acres
MMWD facility	1	11	24	5	55	120	6,600	0.152
Primary trickling filter rock media	1	22	—	5	110	—	9,500	0.218
Administration building	1	12	12	5	60	60	3,600	0.083
Existing lab	1	9	14	5	45	70	3,150	0.072
Secondary trickling filter	2	30	—	5	150	—	17,670	0.406
Nitrification tower	3	4	10	5	20	50	1,000	0.023
Primary trickling filter	3	22	—	5	110	—	9,500	0.218
Phase 1							*22,900*	*0.526*
Phase 2							*17,700*	*0.406*
Phase 3							*10,500*	*0.241*
Demolition total area							**51,100**	**1.173**

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Construction Screening Health Risk Assessment (SHRA) for CalEEMod Output

Project Name:	Las Gallinas Valley Sanitary District Secondary Treatment Upgrade
Client Name:	Albert A. Webb Associates
Mailing Address:	3788 McCray Street, Riverside, CA 92506
Contact(s):	Jillian M. Feyk-Miney
Telephone(s):	(951) 320-6057
E-mail(s):	jillian.feyk-miney@webbassociates.com
Facility Owner/Operator:	Las Gallinas Valley Sanitary District
Mailing Address:	300 Smith Ranch Road, San Rafael, CA 94903
Facility Name:	Las Gallinas Valley Sanitary District
Source Description:	Publically Owned Treatment Works (POTW)
Facility Permit ID:	
Facility Address:	300 Smith Ranch Road, San Rafael, CA 94903
Latitude, North:	38.025472°
Longitude, West:	-122.519695°
Elevation, feet ASL:	10
Author:	Bradford Boyes
Peer Reviewer:	Greg Wolffe, Mike Dudasko
Date:	

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Screening Health Risk Assessment - Construction (volume source)

Time and Age Weighted Toxic Air Contaminants Risks	AERSCREEN/HARP2 Screening Results			
	Risk	Per million	Threshold	Significance
Residential MICR - Multipathway	2.1E-08	0.02	10	PASS
Residential HIC	1.9E-04	—	1	PASS
Residential HIA	0	—	1	PASS
Residential Annual $PM_{2.5}$ ($\mu g/m^3$)	1.2E-06	—	0.3	PASS
Worker MICR - Multipathway	4.3E-10	0.0004	10	PASS
Worker HIC	1.9E-04	—	1	PASS
Worker HIA	0	—	1	PASS
Worker Annual $PM_{2.5}$ ($\mu g/m^3$)	2.9E-06	—	0.3	PASS
Population Cancer Burden	9.2E-05	—	0.5	PASS

Sources: OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016, BAAQMD 2011

Notes:

MICR - Maximum Individual Cancer Risk

HIC - Chronic Hazard Index

HIA - Acute Hazard Index

PASS - Less Than Significant

Tier 1 Screen:

OEHHA derived method (default)

Exposure period = 3 years (duration of construction project)

Residential Mandatory Minimum Multipathway (MP): inhalation, soil ingestion, dermal, mother's milk

Worker Multipathway (MP): inhalation, soil ingestion, dermal

Deposition rate: 0.05 m/s (default)

Screening Health Risk Assessment - Cancer Burden Worksheet

Population Cancer Burden	Value	Units
Population of Urban Area	59,000	persons
Size of Urban Land Area	16.47	square miles
Urban Population Density	3,582	persons/sq mi
Zone Radius from Site (R)	1,000	meters
	0.62	miles
Zone Area (πR^2)	1.21	sq mi
Zone Population	4,343	persons
Residential MICR - Multipathway	2.1E-08	
Population Cancer Burden	9.2E-05	
Threshold	0.5	
Significance	PASS	

Sources: OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016

Nearest Receptors	Type	Distance	Evaluated
WildCare Silveira Ranch*	Worker	300 m	Yes
McInnis Park Apartments	Resident	600 m	Yes
Kindred Transitional Care & Rehabilitation	Worker	800 m	No

** formerly Helen Vine Detox Center*

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AERSCREEN Input Data Tool - Volume Source

AERSCREEN Input Data Parameters	Values	Units
Initial Information		
Title of modeling run	Gallinas	alpha
Input units, English or metric (E/M)	M	alpha
Source type (Point, Volume, Area, Circle, Flare, Shielded, Horizontal)	V	alpha
Source Information		
Emission rate	1	grams/sec
Site total land area (lot or parcel size)	*5*	acres
Volume side length	*142.3*	*meters*
Distance from center to edge	*71.1*	*meters*
Volume height, H	5	meters
Initial lateral dimension of the volume, y (from EPA Table 4-6)	33.09	meters
Initial vertical dimension of the volume, z (from EPA Table 4-6)	2.33	meters
Rural/Urban (R/U)	U	alpha
Population of urban area	59,000	integer
Minimum distance to ambient air		meters
Option for modeling NO_2 chemistry (1, 2, 3)	1	option #
1) No chemistry or pollutant is not NO_2 (worst case unitary)		
2) Use ozone limiting method		
3) Use plume volume molar ratio method		
In-stack NO_2 to NO_X ratio for options 2 or 3		ratio
Ozone concentration (ambient) for options 2 or 3		ppmv
Terrain Height Information		
Include terrain heights (Y/N)	N	alpha
Maximum distance to probe	1,000	meters
Include up to 10 discrete receptors (Y/N)	N	alpha
Filename of discrete receptors (*.txt)		.txt
Use flagpole receptors (Y/N)	N	alpha
Flagpole receptor height		meters
Source base elevation above mean sea level (land parcel)	3.05	meters
Meteorology Information for MAKEMET		
Minimum temperature	278	°K
Maximum temperature	300	°K
Minimum wind speed	0.5	meters/sec
Anemometer height	10	meters
Source of surface characteristics (1-user spec, 2-AERMET, 3-ext file)	1	option #
Surface Albedo	*0.16*	*ratio*
Bowen Ratio	*0.86*	*ratio*
Surface Roughness Length	*0.42*	*meters*
Dominant surface profile (land use: 1, 2, 3, 4, 5, 6, 7, 8)		option #
Dominant climate profile (1-average, 2-wet, 3-dry)		option #
Output File		
Use non-default name (*.out)	Gallinas	.out

Sources: EPA 1992, EPA 2011, URS 2008

Notes:

1) Water; 2) Deciduous Forest; 3) Coniferous Forest; 4) Swamp; 5) Cultivated Land; 6) Grassland; 7) Urban; 8) Desert Shrubland

User Specs:

http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/aermod-table-2

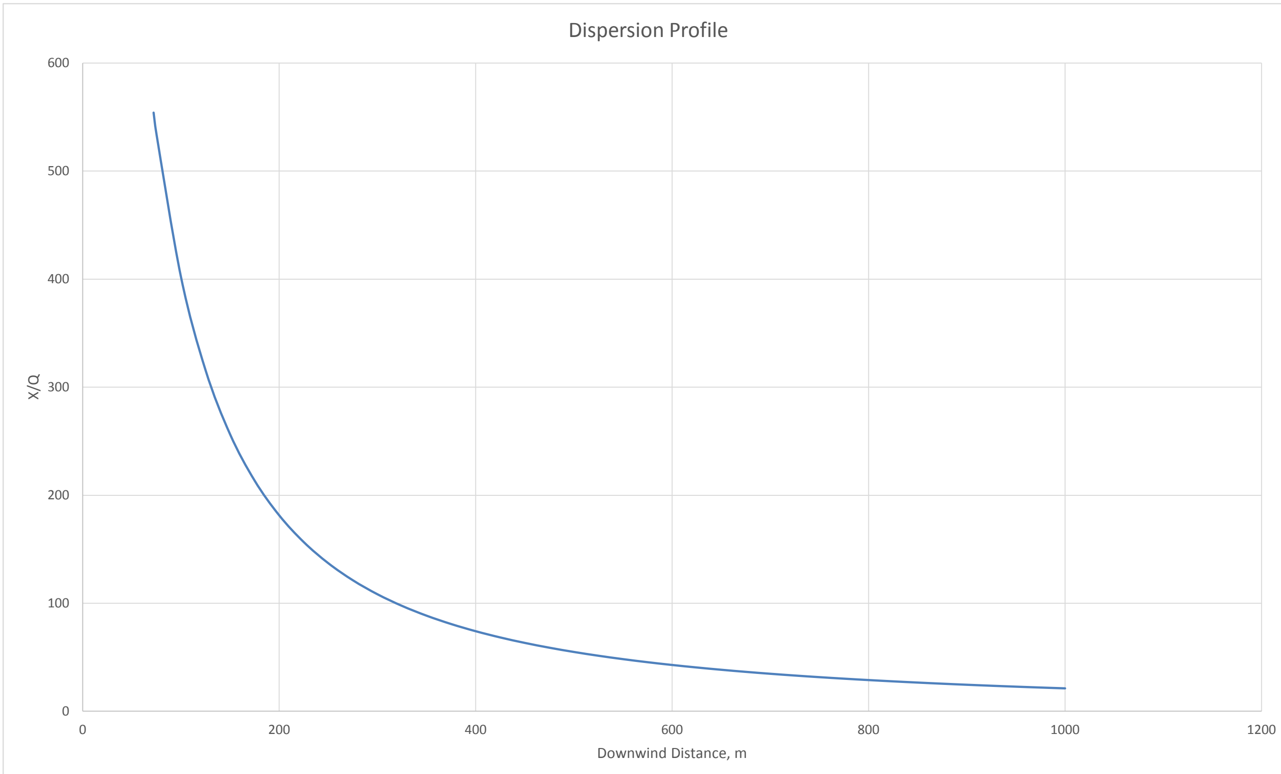
AERSCREEN Maximum Concentration Distance for Unit Emission Rate (1 g/sec), X/Q, Formatting Tool for Distance to Probe = 1,000 m

Import AERSCREEN output file "NAME_max_conc_distance.txt" from ASCII delimited into Excel then copy & paste values into format below

Concentration	Distance	Elevation	Season/Month	Zo sector	Date	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	HT	REF TA	HT
554.11	72.14	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
534.54	75	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
402.02	100	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
315.81	125	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
256.39	150	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
213.5	175	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
181.38	200	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
156.62	225	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
137.06	250	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
121.29	275	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
108.35	300	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
97.594	325	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
88.527	350	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
80.801	375	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
74.154	400	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
68.384	425	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
63.338	450	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
58.894	475	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
54.956	500	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
51.446	525	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
48.301	550	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
45.47	575	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
42.91	600	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
40.586	625	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
38.47	650	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
36.534	675	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
34.759	700	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
33.126	725	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
31.62	750	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
30.226	775	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
28.935	800	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
27.735	825	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
26.617	850	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
25.574	875	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
24.598	900	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
23.685	925	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
22.828	950	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
22.022	975	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
21.264	1000	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2

AERSCREEN Maximum Concentration Distance for Unit Emission Rate (1 g/sec), X/Q, Formatting Tool for Distance to Probe = 1,000 m

Dispersion Profile Format	
Downwind Distance, m	X/Q, (μg/m^3)/(g/sec)
X	Y
72.14	554.11
75	534.54
100	402.02
125	315.81
150	256.39
175	213.5
200	181.38
225	156.62
250	137.06
275	121.29
300	108.35
325	97.594
350	88.527
375	80.801
400	74.154
425	68.384
450	63.338
475	58.894
500	54.956
525	51.446
550	48.301
575	45.47
600	42.91
625	40.586
650	38.47
675	36.534
700	34.759
725	33.126
750	31.62
775	30.226
800	28.935
825	27.735
850	26.617
875	25.574
900	24.598
925	23.685
950	22.828
975	22.022
1000	21.264



Surface Characteristics of Meteorological Sites Used in AERMET

Station	Surface Albedo	Bowen Ratio	Surface Roughness, m
Anaheim	0.17	1.0	0.453
Azusa	0.19	1.0	0.361
Banning Airport	0.22	1.5	0.149
Burbank	0.19	1.0	0.532
Central LA	0.18	1.0	0.561
Compton	0.18	1.0	0.547
Costa Mesa	0.18	1.0	0.347
Crestline	0.17	1.0	0.406
Fontana	0.19	1.0	0.240
Indio	0.19	1.5	0.218
La Habra	0.18	1.0	0.467
Lake Elsinore	0.20	1.0	0.232
LAX	0.16	1.0	0.232
Long Beach	0.18	1.0	0.504
Lynwood	0.18	1.0	0.428
Mission Viejo	0.18	1.0	0.300
Palm Springs	0.22	1.5	0.444
Perris	0.20	1.0	0.193
Pico Rivera	0.18	1.0	0.338
Pomona	0.18	1.0	0.470
Redlands	0.20	1.0	0.331
Reseda	0.18	1.0	0.504
Riverside	0.19	1.0	0.314
San Bernardino	0.18	1.0	0.315
Santa Clarita	0.21	1.0	0.254
Upland	0.18	1.0	0.334
West LA	0.18	1.0	0.402

Source: SCAQMD 2015

Average for SoCal*	**0.18**	**1.0**	**0.378**
Average Desert Areas	**0.21**	**1.5**	**0.270**

* non-desert areas

San Francisco Bay Shoreline Area:

Albedo = 0.16

Bowen Ratio = 0.86

Surface Roughness Length = 0.42

Source:

URS Consulting (URS). 2008. Revised Modeling for Marsh Landing Generating Station Project, Application No. 18404, Plant No. 19169. Website (http://www.baaqmd.gov/~/media/A9A6F3283C5943DA8D20B145A0B40719.ashx) accessed November 27, 2015.

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HARP2 Tier 2 Screening Health Risk Assessment Ground Level Concentrations Tool - Phase 1 Peaks

Toxics Air Contaminants	CAS No.	Emission Rates		AERSCREEN Results for Receptors				Calculated GLCs for HARP2			
		An. Avg.	Hr. Max.	Resident X/Q		Worker X/Q		Resident X ug/m^3		Worker X ug/m^3	
		g/sec	g/sec	Annual	Hourly	Annual	Hourly	Annual	Hourly	Annual	Hourly
Diesel Particulate Matter (DPM)	9901	**1.30E-05**	**2.43E-02**	4.29	**42.9**	10.84	**108.4**	5.58E-05	1.04E+00	1.41E-04	2.63E+00
Diesel Total Organic Gas (DTOG)	9902	**3.06E-05**	**5.80E-02**	4.29	42.9	10.84	108.4	1.31E-04	2.49E+00	3.31E-04	6.28E+00
Particulate Matter 2.5 Microns or Less	88101	**2.72E-07**	**1.84E-02**	4.29	42.9	10.84	108.4	1.17E-06	7.91E-01	2.95E-06	2.00E+00
		—	—	—	—	—	—	*$PM_{2.5}$ 24h:*	*4.75E-01*	*$PM_{2.5}$ 24h:*	*1.20E+00*

Sources: CalEEMod v2013.2.2, OEHHA 2015, EPA 1992, EPA 2011

Screening Health Risk Assessment Emission Rate Aggregation Tool for CalEEMod Output - Phase 1 Peaks (Phase 3 for Fugitive $PM_{2.5}$)

Onsite Construction Phase DPM	CAS No.	Exhaust PM_{10}	Phase Duration		Annual Average		Hourly Maximum	
		lbs/day	days	hrs/day	lbs/hr	g/sec	lbs/hr	g/sec
Demolition	9901	**0.7266**	**20**	**8**	4.54E-06	5.73E-07	9.08E-02	1.15E-02
Site Preparation	9901	**1.3067**	**2**	**8**	8.17E-07	1.03E-07	1.63E-01	2.06E-02
Grading	9901	**1.1328**	**4**	**8**	1.42E-06	1.79E-07	1.42E-01	1.79E-02
Building Construction	9901	**1.5391**	**200**	**8**	9.63E-05	1.21E-05	1.92E-01	2.43E-02
Paving	9901	**0.0000**	**0**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Architectural Coating	9901	**0.0000**	**0**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Time-weighted Average Rates	**9901**	**1.4579**	**226**	**—**	**1.03E-04**	**1.30E-05**	**1.92E-01**	**2.43E-02**

Onsite Construction Phase DTOG	CAS No.	Exhaust ROG	Phase Duration		Annual Average		Hourly Maximum	
		lbs/day	days	hrs/day	lbs/hr	g/sec	lbs/hr	g/sec
Demolition	9902	**1.2049**	**20**	**8**	8.28E-06	1.04E-06	1.66E-01	2.09E-02
Site Preparation	9902	**2.3109**	**2**	**8**	1.59E-06	2.00E-07	3.17E-01	4.00E-02
Grading	9902	**1.9193**	**4**	**8**	2.64E-06	3.33E-07	2.64E-01	3.32E-02
Building Construction	9902	**3.3468**	**200**	**8**	2.30E-04	2.90E-05	4.60E-01	5.80E-02
Paving	9902	**0.0000**	**0**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Architectural Coating	9902	**0.0000**	**0**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Time-weighted Average Rates	**9902**	**3.1228**	**226**	**—**	**2.43E-04**	**3.06E-05**	**4.60E-01**	**5.80E-02**

Sources: CalEEMod v2013.2.2, OEHHA 2015

Notes:

DPM = diesel exhaust PM_{10}

DTOG = diesel exhaust ROG / 0.91 (AP-42 Table 3.4-1)

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HARP2 Tier 2 Screening Health Risk Assessment Ground Level Concentrations Tool - Phase 1 Peaks

Onsite Construction Phase $PM_{2.5}$	CAS No.	Fugitive Dust	Phase Duration		Annual Average		Hourly Maximum	
		lbs/day	days	hrs/day	lbs/hr	g/sec	lbs/hr	g/sec
Demolition	88101	**0.0321**	**19**	**8**	1.91E-07	2.41E-08	4.01E-03	5.06E-04
Site Preparation	88101	**1.1696**	**2**	**8**	7.32E-07	9.23E-08	1.46E-01	1.84E-02
Grading	88101	**0.9882**	**4**	**8**	1.24E-06	1.56E-07	1.24E-01	1.56E-02
Building Construction	88101	**0.0000**	**200**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Paving	88101	**0.0000**	**0**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Architectural Coating	88101	**0.0000**	**0**	**8**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Time-weighted Average Rates	**88101**	**0.0307**	**225**	**—**	**2.16E-06**	**2.72E-07**	**1.46E-01**	**1.84E-02**

Sources: CalEEMod v2013.2.2, OEHHA 2015

HARP2 CSV Import Format Tool: projectname_GLCList.csv (copy & paste as values indexed rows & save to .csv file with no headers)

Index	Group1	Group2	POLID/CAS	Pollutant Name	Ave Conc	Max Hr Conc for Acute	Pasture	Fish	Water
User comments:	this field is optional (blank), see user's guide	this field is optional (blank), see user's guide	CAS no. is the lookup reference ID in HARP2 (not AQMD IDs)	HARP2 names differ from names on other lists, e.g., 1401, AB 2588 (see HARP2 TAC list)	annual maximum concentration (permitted PTE)	hourly maximum concentration (equipment rating)	for the mandatory minimum multipathway analysis these pathway receptors are set to zeros in the format (pathways not used)		
	(optional)	**(optional)**	**(CAS No.)**	**(HARP2 Name)**	**max_{ann} ug/m^3**	**max_{hr} ug/m^3**	**ug/m^3**	**ug/m^3**	**ug/m^3**
1			9901	DieselExhPM	5.577E-05	1.041E+00	0	0	0
2			9902	DieselExhTOG	1.313E-04	2.488E+00	0	0	0

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HARP2 CSV Import Format Tool: projectname_GLCList.csv (copy & paste as values indexed rows & save to .csv file with no headers)

Index	Group1	Group2	POLID/CAS	Pollutant Name	Ave Conc	Max Hr Conc for Acute	Pasture	Fish	Water
User comments:	this field is optional (blank), see user's guide	this field is optional (blank), see user's guide	CAS no. is the lookup reference ID in HARP2 (not AQMD IDs)	HARP2 names differ from names on other lists, e.g., 1401, AB 2588 (see HARP2 TAC list)	annual maximum concentration (permitted PTE)	hourly maximum concentration (equipment rating)	for the mandatory minimum multipathway analysis these pathway receptors are set to zeros in the format (pathways not used)		
	(optional)	**(optional)**	**(CAS No.)**	**(HARP2 Name)**	**max_{ann} ug/m^3**	**max_{hr} ug/m^3**	**ug/m^3**	**ug/m^3**	**ug/m^3**
1			9901	DieselExhPM	1.408E-04	2.629E+00	0	0	0
2			9902	DieselExhTOG	3.314E-04	6.282E+00	0	0	0

HARP2 CSV Output Format Tool - Cancer Risk Sums

Residential

***HARP - HRACalc v16057 3/10/2016 3:32:32 PM - Cancer Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	RISK_SUM	SCENARIO	DETAILS	INH_RISK	SOIL_RISK	DERMAL_RISK	MMILK_RISK	WATER_RISK	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RISK	PIG_RISK	CHICKEN_RISK	EGG_RISK	1ST_DRIVER	2ND_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1			9901	DieselExhPM	5.58E-05	2.1247E-08	3YrCancerDerived	*	2.12E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
2			9902	DieselExhTOG	1.31E-04	0	3YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
						2.12E-08	**2.12E-08**		**2.12E-08**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Worker

***HARP - HRACalc v16057 3/10/2016 3:33:34 PM - Cancer Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	RISK_SUM	SCENARIO	DETAILS	INH_RISK	SOIL_RISK	DERMAL_RISK	MMILK_RISK	WATER_RISK	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RISK	PIG_RISK	CHICKEN_RISK	EGG_RISK	1ST_DRIVER	2ND_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1			9901	DieselExhPM	5.58E-05	4.3216E-10	3YrCancerDerived	*	4.32E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
2			9902	DieselExhTOG	1.31E-04	0	3YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
						4.32E-10	**4.32E-10**		**4.32E-10**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

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HARP2 CSV Output Format Tool - Chronic Risk Maxima

Residential

***HARP - HRACalc v16057 3/10/2016 3:32:32 PM - Chronic Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY
1			9901	DieselExhPM	5.57655E-05	NonCancerChronicDerived	0	0	0	0
2			9902	DieselExhTOG	0.000131259	NonCancerChronicDerived	0	0	0	0
						0.0002	**0**	**0**	**0**	**0**

INDEX	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	DETAILS	INH_CONC	SOIL_DOSE
1	0	0	0.000011153	0	0	0	0	0	0	0	*	0.000055766	0
2	0	0	0	0	0	0	0	0	0	0	*	0.00013126	0
	0	**0**	**0.000011153**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.000187026**	**0**

INDEX	DERMAL_DOSE	MMILK_DOSE	WATER_DOSE	FISH_DOSE	CROP_DOSE	BEEF_DOSE	DAIRY_DOSE	PIG_DOSE	CHICKEN_DOSE	EGG_DOSE	1ST_DRIVER	2ND_DRIVER	3RD_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
2	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Worker

***HARP - HRACalc v16057 3/10/2016 3:33:34 PM - Chronic Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY
1			9901	DieselExhPM	5.57655E-05	NonCancerChronicDerived	0	0	0	0
2			9902	DieselExhTOG	0.000131259	NonCancerChronicDerived	0	0	0	0
						0.0002	**0**	**0**	**0**	**0**

INDEX	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	DETAILS	INH_CONC	SOIL_DOSE
1	0	0	0.000011153	0	0	0	0	0	0	0	*	0.000055766	0
2	0	0	0	0	0	0	0	0	0	0	*	0.00013126	0
	0	**0**	**0.000011153**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.000187026**	**0**

INDEX	DERMAL_DOSE	MMILK_DOSE	WATER_DOSE	FISH_DOSE	CROP_DOSE	BEEF_DOSE	DAIRY_DOSE	PIG_DOSE	CHICKEN_DOSE	EGG_DOSE	1ST_DRIVER	2ND_DRIVER	3RD_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
2	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

HARP2 CSV Output Format Tool - Acute Risk Maxima

Residential

***HARP - HRACalc v16057 3/10/2016 3:32:32 PM - Acute Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1			9901	DieselExhPM	1.041091062	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2			9902	DieselExhTOG	2.487770122	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						0.0000	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Worker

***HARP - HRACalc v16057 3/10/2016 3:33:34 PM - Acute Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1			9901	DieselExhPM	1.041091062	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2			9902	DieselExhTOG	2.487770122	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						0.0000	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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Operational Screening Health Risk Assessment (SHRA)

Project Name:	Las Gallinas Valley Sanitary District Secondary Treatment Upgrade
Client Name:	Albert A. Webb Associates
Mailing Address:	3788 McCray Street, Riverside, CA 92506
Contact(s):	Jillian M. Feyk-Miney
Telephone(s):	(951) 320-6057
E-mail(s):	jillian.feyk-miney@webbassociates.com
Facility Owner/Operator:	Las Gallinas Valley Sanitary District
Mailing Address:	300 Smith Ranch Road, San Rafael, CA 94903
Facility Name:	Las Gallinas Valley Sanitary District
Source Description:	Publically Owned Treatment Works (POTW)
Facility Permit ID:	
Facility Address:	300 Smith Ranch Road, San Rafael, CA 94903
Latitude, North:	38.025472°
Longitude, West:	-122.519695°
Elevation, feet ASL:	10
Author:	Bradford Boyes, Carla Jo, Randy Frazier
Peer Reviewer:	Greg Wolffe, Mike Dudasko
Date:	

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Screening Health Risk Assessment - Operation (volume source)

Time and Age Weighted Toxic Air Contaminants Risks	AERSCREEN/HARP2 Screening Results			
	Risk	Per million	Threshold	Significance
Residential MICR - Multipathway	1.8E-07	0.18	10	PASS
Residential HIC	8.6E-03	—	1	PASS
Residential HIA	4.5E-03	—	1	PASS
Worker MICR - Multipathway	3.2E-08	0.032	10	PASS
Worker HIC	2.2E-02	—	1	PASS
Worker HIA	1.1E-02	—	1	PASS
Population Cancer Burden	7.6E-04	—	0.5	PASS

Sources: OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016, BAAQMD 2011

Notes:

MICR - Maximum Individual Cancer Risk

HIC - Chronic Hazard Index

HIA - Acute Hazard Index

PASS - Less Than Significant

Tier 1 Screen:

OEHHA derived method (default)

Exposure period = 30 years resident; 25 years worker (defaults)

Residential Mandatory Minimum Multipathway (MP): inhalation, soil ingestion, dermal, mother's milk

Worker Multipathway (MP): inhalation, soil ingestion, dermal

Deposition rate: 0.05 m/s (default)

Screening Health Risk Assessment - Cancer Burden Worksheet

Population Cancer Burden	Value	Units
Population of Urban Area	59,000	persons
Size of Urban Land Area	16.47	square miles
Urban Population Density	3,582	persons/sq mi
Zone Radius from Site (R)	1,000	meters
	0.62	miles
Zone Area (πR^2)	1.21	sq mi
Zone Population	4,343	persons
Residential MICR - Multipathway	1.8E-07	
Population Cancer Burden	7.6E-04	
Threshold	0.5	
Significance	PASS	

Sources: OEHHA 2015, EPA 1992, EPA 2011, EPA 2015b, CARB 2016

Nearest Receptors	Type	Distance	Evaluated
WildCare Silveira Ranch*	Worker	300 m	Yes
McInnis Park Apartments	Resident	600 m	Yes
Kindred Transitional Care & Rehabilitation	Worker	800 m	No

** formerly Helen Vine Detox Center*

AERSCREEN Input Data Tool - Volume Source

AERSCREEN Input Data Parameters	Values	Units
Initial Information		
Title of modeling run	Gallinas	alpha
Input units, English or metric (E/M)	M	alpha
Source type (Point, Volume, Area, Circle, Flare, Shielded, Horizontal)	V	alpha
Source Information		
Emission rate	1	grams/sec
Site total land area (lot or parcel size)	*5*	acres
Volume side length	*142.3*	*meters*
Distance from center to edge	*71.1*	*meters*
Volume height, H	5	meters
Initial lateral dimension of the volume, y (from EPA Table 4-6)	33.09	meters
Initial vertical dimension of the volume, z (from EPA Table 4-6)	2.33	meters
Rural/Urban (R/U)	U	alpha
Population of urban area	59,000	integer
Minimum distance to ambient air		meters
Option for modeling NO_2 chemistry (1, 2, 3)	1	option #
1) No chemistry or pollutant is not NO_2 (worst case unitary)		
2) Use ozone limiting method		
3) Use plume volume molar ratio method		
In-stack NO_2 to NO_X ratio for options 2 or 3		ratio
Ozone concentration (ambient) for options 2 or 3		ppmv
Terrain Height Information		
Include terrain heights (Y/N)	N	alpha
Maximum distance to probe	1,000	meters
Include up to 10 discrete receptors (Y/N)	N	alpha
Filename of discrete receptors (*.txt)		.txt
Use flagpole receptors (Y/N)	N	alpha
Flagpole receptor height		meters
Source base elevation above mean sea level (land parcel)	3.05	meters
Meteorology Information for MAKEMET		
Minimum temperature	278	°K
Maximum temperature	300	°K
Minimum wind speed	0.5	meters/sec
Anemometer height	10	meters
Source of surface characteristics (1-user spec, 2-AERMET, 3-ext file)	1	option #
Surface Albedo	*0.16*	*ratio*
Bowen Ratio	*0.86*	*ratio*
Surface Roughness Length	*0.42*	*meters*
Dominant surface profile (land use: 1, 2, 3, 4, 5, 6, 7, 8)		option #
Dominant climate profile (1-average, 2-wet, 3-dry)		option #
Output File		
Use non-default name (*.out)	Gallinas	.out

Sources: EPA 1992, EPA 2011, URS 2008

Notes:

1) Water; 2) Deciduous Forest; 3) Coniferous Forest; 4) Swamp; 5) Cultivated Land; 6) Grassland; 7) Urban; 8) Desert Shrubland

User Specs:

http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/aermod-table-2

AERSCREEN Maximum Concentration Distance for Unit Emission Rate (1 g/sec), X/Q, Formatting Tool for Distance to Probe = 1,000 m

Import AERSCREEN output file "NAME_max_conc_distance.txt" from ASCII delimited into Excel then copy & paste values into format below

Concentration	Distance	Elevation	Season/Month	Zo sector	Date	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	HT	REF TA	HT
554.11	72.14	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
534.54	75	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
402.02	100	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
315.81	125	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
256.39	150	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
213.5	175	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
181.38	200	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
156.62	225	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
137.06	250	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
121.29	275	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
108.35	300	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
97.594	325	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
88.527	350	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
80.801	375	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
74.154	400	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
68.384	425	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
63.338	450	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
58.894	475	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
54.956	500	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
51.446	525	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
48.301	550	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
45.47	575	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
42.91	600	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
40.586	625	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
38.47	650	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
36.534	675	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
34.759	700	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
33.126	725	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
31.62	750	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
30.226	775	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
28.935	800	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
27.735	825	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
26.617	850	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
25.574	875	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
24.598	900	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
23.685	925	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
22.828	950	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
22.022	975	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2
21.264	1000	0	Annual	0-360	10032701	-12.64	0.126	-9	0.02	-999	103	14.6	0.42	0.86	0.16	2	10	300	2

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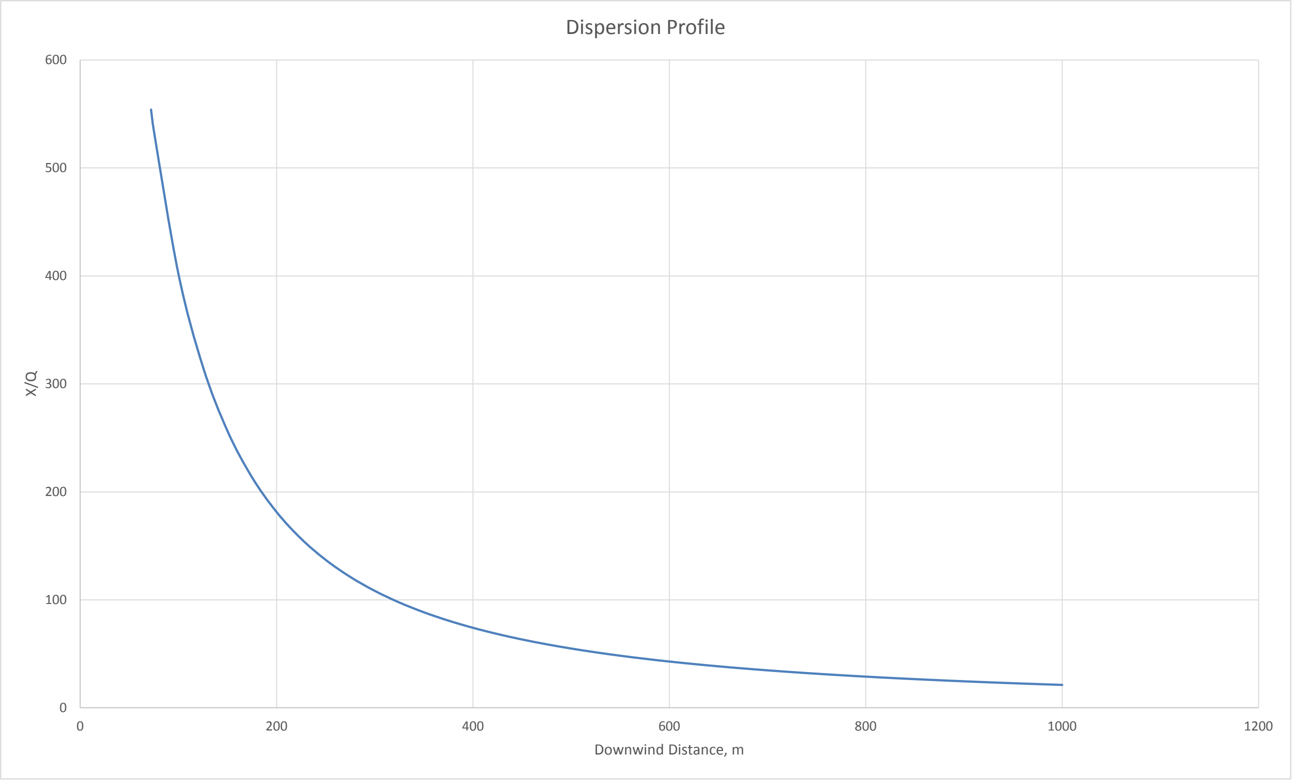
AERSCREEN Maximum Concentration Distance for Unit Emission Rate (1 g/sec), X/Q, Formatting Tool for Distance to Probe = 1,000 m

Dispersion Profile Format	
Downwind Distance, m	X/Q, (μg/m^3)/(g/sec)
X	Y
72.14	554.11
75	534.54
100	402.02
125	315.81
150	256.39
175	213.5
200	181.38
225	156.62
250	137.06
275	121.29
300	108.35
325	97.594
350	88.527
375	80.801
400	74.154
425	68.384
450	63.338
475	58.894
500	54.956
525	51.446
550	48.301
575	45.47
600	42.91
625	40.586
650	38.47
675	36.534
700	34.759
725	33.126
750	31.62
775	30.226
800	28.935
825	27.735
850	26.617
875	25.574
900	24.598
925	23.685
950	22.828
975	22.022
1000	21.264



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Surface Characteristics of Meteorological Sites Used in AERMET

Station	Surface Albedo	Bowen Ratio	Surface Roughness, m
Anaheim	0.17	1.0	0.453
Azusa	0.19	1.0	0.361
Banning Airport	0.22	1.5	0.149
Burbank	0.19	1.0	0.532
Central LA	0.18	1.0	0.561
Compton	0.18	1.0	0.547
Costa Mesa	0.18	1.0	0.347
Crestline	0.17	1.0	0.406
Fontana	0.19	1.0	0.240
Indio	0.19	1.5	0.218
La Habra	0.18	1.0	0.467
Lake Elsinore	0.20	1.0	0.232
LAX	0.16	1.0	0.232
Long Beach	0.18	1.0	0.504
Lynwood	0.18	1.0	0.428
Mission Viejo	0.18	1.0	0.300
Palm Springs	0.22	1.5	0.444
Perris	0.20	1.0	0.193
Pico Rivera	0.18	1.0	0.338
Pomona	0.18	1.0	0.470
Redlands	0.20	1.0	0.331
Reseda	0.18	1.0	0.504
Riverside	0.19	1.0	0.314
San Bernardino	0.18	1.0	0.315
Santa Clarita	0.21	1.0	0.254
Upland	0.18	1.0	0.334
West LA	0.18	1.0	0.402

Source: SCAQMD 2015

Average for SoCal*	**0.18**	**1.0**	**0.378**
Average Desert Areas	**0.21**	**1.5**	**0.270**

* non-desert areas

San Francisco Bay Shoreline Area:

Albedo = 0.16

Bowen Ratio = 0.86

Surface Roughness Length = 0.42

Source:

URS Consulting (URS). 2008. Revised Modeling for Marsh Landing Generating Station Project, Application No. 18404, Plant No. 19169. Website (http://www.baaqmd.gov/~/media/A9A6F3283C5943DA8D20B145A0B40719.ashx) accessed November 27, 2015.

HARP2 Tier 2 Screening Health Risk Assessment Ground Level Concentrations Tool

Toxics Air Contaminants	CAS No.	Emission Rates		AERSCREEN Results for Receptors				Calculated GLCs for HARP2			
		An. Avg.	Hr. Max.	Resident X/Q		Worker X/Q		Resident X ug/m^3		Worker X ug/m^3	
		g/sec	g/sec	Annual	Hourly	Annual	Hourly	Annual	Hourly	Annual	Hourly
Chloroform	67663	1.84E-03	1.04E-02	4.29	**42.9**	10.84	**108.4**	7.91E-03	4.44E-01	2.00E-02	1.12E+00
Benzene	71432	1.70E-04	9.46E-04	4.29	42.9	10.84	108.4	7.29E-04	4.06E-02	1.84E-03	1.02E-01
Methyl Chloroform (1,1,1-TCA)	71556	5.07E-03	2.85E-02	4.29	42.9	10.84	108.4	2.17E-02	1.22E+00	5.49E-02	3.09E+00
Methylene Chloride	75092	4.38E-03	2.46E-02	4.29	42.9	10.84	108.4	1.88E-02	1.06E+00	4.74E-02	2.66E+00
Trichloroethylene (TCE)	79016	5.07E-04	2.84E-03	4.29	42.9	10.84	108.4	2.17E-03	1.22E-01	5.49E-03	3.07E-01
1,4-Dichlorobenzene	106467	2.30E-04	1.31E-03	4.29	42.9	10.84	108.4	9.88E-04	5.64E-02	2.50E-03	1.42E-01
Toluene	108883	1.29E-03	7.25E-03	4.29	42.9	10.84	108.4	5.53E-03	3.11E-01	1.40E-02	7.86E-01
Tetrachloroethylene (PERC)	127184	1.70E-03	9.56E-03	4.29	42.9	10.84	108.4	7.31E-03	4.10E-01	1.85E-02	1.04E+00
Xylenes	1330207	1.52E-03	8.57E-03	4.29	42.9	10.84	108.4	6.52E-03	3.68E-01	1.65E-02	9.28E-01

Sources: CalEEMod v2013.2.2, OEHHA 2015, EPA 1992, EPA 2011

Post-Project Operational Emissions for Screening Risk Assessment

TACs	CAS No.	Annual Avg	Daily Max	An. Avg.	Hr. Max.
		lbs/yr	lbs/day	g/sec	g/sec
Chloroform	67663	**128.0**	**1.97**	1.84E-03	1.04E-02
Benzene	71432	**11.8**	**0.18**	1.70E-04	9.46E-04
Methyl Chloroform (1,1,1-TCA)	71556	**352.0**	**5.42**	5.07E-03	2.85E-02
Methylene Chloride	75092	**304.0**	**4.68**	4.38E-03	2.46E-02
Trichloroethylene (TCE)	79016	**35.2**	**0.54**	5.07E-04	2.84E-03
1,4-Dichlorobenzene	106467	**16.0**	**0.25**	2.30E-04	1.31E-03
Toluene	108883	**89.6**	**1.38**	1.29E-03	7.25E-03
Tetrachloroethylene (PERC)	127184	**118.4**	**1.82**	1.70E-03	9.56E-03
Xylenes	1330207	**105.6**	**1.63**	1.52E-03	8.57E-03

Source: Aqua 2015, BAAQMD 2013b

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HARP2 CSV Import Format Tool: projectname_GLCList.csv (copy & paste as values indexed rows & save to .csv file with no headers)

Index	Group1	Group2	POLID/CAS	Pollutant Name	Ave Conc	Max Hr Conc for Acute	Pasture	Fish	Water
User comments:	this field is optional (blank), see user's guide	this field is optional (blank), see user's guide	CAS no. is the lookup reference ID in HARP2 (not AQMD IDs)	HARP2 names differ from names on other lists, e.g., 1401, AB 2588 (see HARP2 TAC list)	annual maximum concentration (permitted PTE)	hourly maximum concentration (equipment rating)	for the mandatory minimum multipathway analysis these pathway receptors are set to zeros in the format (pathways not used)		
	(optional)	**(optional)**	**(CAS No.)**	**(HARP2 Name)**	**max_{ann} ug/m^3**	**max_{hr} ug/m^3**	**ug/m^3**	**ug/m^3**	**ug/m^3**
1			67663	Chloroform	7.907E-03	4.442E-01	0	0	0
2			71432	Benzene	7.289E-04	4.059E-02	0	0	0
3			71556	1,1,1-TCA	2.174E-02	1.222E+00	0	0	0
4			75092	Methylene Chlor	1.878E-02	1.055E+00	0	0	0
5			79016	TCE	2.174E-03	1.218E-01	0	0	0
6			106467	p-DiClBenzene	9.884E-04	5.637E-02	0	0	0
7			108883	Toluene	5.535E-03	3.112E-01	0	0	0
8			127184	Perc	7.314E-03	4.104E-01	0	0	0
9			1330207	Xylenes	6.523E-03	3.675E-01	0	0	0

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HARP2 CSV Import Format Tool: projectname_GLCList.csv (copy & paste as values indexed rows & save to .csv file with no headers)

Index	Group1	Group2	POLID/CAS	Pollutant Name	Ave Conc	Max Hr Conc for Acute	Pasture	Fish	Water
User comments:	this field is optional (blank), see user's guide	this field is optional (blank), see user's guide	CAS no. is the lookup reference ID in HARP2 (not AQMD IDs)	HARP2 names differ from names on other lists, e.g., 1401, AB 2588 (see HARP2 TAC list)	annual maximum concentration (permitted PTE)	hourly maximum concentration (equipment rating)	for the mandatory minimum multipathway analysis these pathway receptors are set to zeros in the format (pathways not used)		
	(optional)	**(optional)**	**(CAS No.)**	**(HARP2 Name)**	**max_{ann} ug/m^3**	**max_{hr} ug/m^3**	**ug/m^3**	**ug/m^3**	**ug/m^3**
1			67663	Chloroform	1.997E-02	1.122E+00	0	0	0
2			71432	Benzene	1.841E-03	1.025E-01	0	0	0
3			71556	1,1,1-TCA	5.491E-02	3.086E+00	0	0	0
4			75092	Methylene Chlor	4.742E-02	2.665E+00	0	0	0
5			79016	TCE	5.491E-03	3.074E-01	0	0	0
6			106467	p-DiClBenzene	2.496E-03	1.423E-01	0	0	0
7			108883	Toluene	1.398E-02	7.857E-01	0	0	0
8			127184	Perc	1.847E-02	1.036E+00	0	0	0
9			1330207	Xylenes	1.647E-02	9.280E-01	0	0	0

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HARP2 CSV Output Format Tool - Cancer Risk Sums

Residential

***HARP - HRACalc v16057 2/26/2016 8:43:49 PM - Cancer Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	RISK_SUM	SCENARIO	DETAILS	INH_RISK	SOIL_RISK	DERMAL_RISK	MMILK_RISK	WATER_RISK	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RISK	PIG_RISK	CHICKEN_RISK	EGG_RISK	1ST_DRIVER	2ND_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1			67663	Chloroform	7.91E-03	1.1816E-07	30YrCancerDerived	*	1.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
2			71432	Benzene	7.29E-04	5.7333E-08	30YrCancerDerived	*	5.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
3			71556	1,1,1-TCA	2.17E-02	0	30YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
4			75092	Methylene Chlor	1.88E-02	5.1696E-08	30YrCancerDerived	*	5.17E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
5			79016	TCE	2.17E-03	1.1972E-08	30YrCancerDerived	*	1.20E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
6			106467	p-DiClBenzene	9.88E-04	3.1096E-08	30YrCancerDerived	*	3.11E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
7			108883	Toluene	5.53E-03	0	30YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
8			127184	Perc	7.31E-03	1.2081E-07	30YrCancerDerived	*	1.21E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
9			1330207	Xylenes	6.52E-03	0	30YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
						1.75E-07	**1.75E-07**		**1.75E-07**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Worker

***HARP - HRACalc v16057 2/26/2016 8:45:38 PM - Cancer Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	RISK_SUM	SCENARIO	DETAILS	INH_RISK	SOIL_RISK	DERMAL_RISK	MMILK_RISK	WATER_RISK	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RISK	PIG_RISK	CHICKEN_RISK	EGG_RISK	1ST_DRIVER	2ND_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1			67663	Chloroform	2.00E-02	2.1343E-08	25YrCancerDerived	*	2.13E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
2			71432	Benzene	1.84E-03	1.0356E-08	25YrCancerDerived	*	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
3			71556	1,1,1-TCA	5.49E-02	0	25YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
4			75092	Methylene Chlor	4.74E-02	9.3376E-09	25YrCancerDerived	*	9.34E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
5			79016	TCE	5.49E-03	2.1624E-09	25YrCancerDerived	*	2.16E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
6			106467	p-DiClBenzene	2.50E-03	5.6166E-09	25YrCancerDerived	*	5.62E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
7			108883	Toluene	1.40E-02	0	25YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
8			127184	Perc	1.85E-02	2.1821E-08	25YrCancerDerived	*	2.18E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00
9			1330207	Xylenes	1.65E-02	0	25YrCancerDerived	*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
						3.17E-08	**3.17E-08**		**3.17E-08**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

HARP2 CSV Output Format Tool - Chronic Risk Maxima

Residential

***HARP - HRACalc v16057 2/26/2016 8:43:49 PM - Chronic Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	DETAILS	INH_CONC	SOIL_DOSE	DERMAL_DOSE	MMILK_DOSE	WATER_DOSE	FISH_DOSE	CROP_DOSE	BEEF_DOSE	DAIRY_DOSE	PIG_DOSE	CHICKEN_DOSE	EGG_DOSE	1ST_DRIVER	2ND_DRIVER	3RD_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1			67663	Chloroform	0.007907109	NonCancerChronicDerived	0	0	0	0.000026357	0.000026357	0.000026357	0	0	0	0	0	0	0	0	*	0.0079071	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
2			71432	Benzene	0.000728937	NonCancerChronicDerived	0	0	0	0	0	0	0	0	0	0	0	0.00024298	0	0	*	0.00072894	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
3			71556	1,1,1-TCA	0.02174455	NonCancerChronicDerived	0	0.000021745	0	0	0	0	0	0	0	0	0	0	0	0	*	0.021745	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
4			75092	Methylene Chlor	0.018779384	NonCancerChronicDerived	0.000046948	0.000046948	0	0	0	0	0	0	0	0	0	0	0	0	*	0.018779	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
5			79016	TCE	0.002174455	NonCancerChronicDerived	0	3.6241E-06	0	0	0	0	0	0	3.6241E-06	0	0	0	0	0	*	0.0021745	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
6			106467	p-DiClBenzene	0.000988389	NonCancerChronicDerived	0	1.2355E-06	0	1.2355E-06	1.2355E-06	0	1.2355E-06	0	0	0	0	0	0	0	*	0.00098839	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
7			108883	Toluene	0.005534976	NonCancerChronicDerived	0	0.00001845	0	0	0	0.00001845	0.00001845	0	0	0	0	0	0	0	*	0.005535	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
8			127184	Perc	0.007314076	NonCancerChronicDerived	0	0	0	0.00020897	0.00020897	0	0	0	0	0	0	0	0	0	*	0.0073141	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
9			1330207	Xylenes	0.006523365	NonCancerChronicDerived	0	9.3191E-06	0	0	0	0	9.3191E-06	0	9.3191E-06	0	0	0	0	0	*	0.0065234	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
						0.0086	**0**	**0**	**0**	**0.000026357**	**0.000026357**	**0.000026357**	**0**	**0**	**0**	**0**	**0**	**0.00024298**	**0**	**0**	**0**	**0.00863604**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Worker

***HARP - HRACalc v16057 2/26/2016 8:45:38 PM - Chronic Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	DETAILS	INH_CONC	SOIL_DOSE	DERMAL_DOSE	MMILK_DOSE	WATER_DOSE	FISH_DOSE	CROP_DOSE	BEEF_DOSE	DAIRY_DOSE	PIG_DOSE	CHICKEN_DOSE	EGG_DOSE	1ST_DRIVER	2ND_DRIVER	3RD_DRIVER	PASTURE_CONC	FISH_CONC	WATER_CONC
1			67663	Chloroform	0.019965865	NonCancerChronicDerived	0	0	0	0.000066553	0.000066553	0.000066553	0	0	0	0	0	0	0	0	*	0.019966	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
2			71432	Benzene	0.001840603	NonCancerChronicDerived	0	0	0	0	0	0	0	0	0	0	0	0.00061353	0	0	*	0.0018406	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
3			71556	1,1,1-TCA	0.054906129	NonCancerChronicDerived	0	0.000054906	0	0	0	0	0	0	0	0	0	0	0	0	*	0.054906	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
4			75092	Methylene Chlor	0.047418929	NonCancerChronicDerived	0.00011855	0.00011855	0	0	0	0	0	0	0	0	0	0	0	0	*	0.047419	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
5			79016	TCE	0.005490613	NonCancerChronicDerived	0	0.000009151	0	0	0	0	0	0	0.000009151	0	0	0	0	0	*	0.0054906	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
6			106467	p-DiClBenzene	0.002495733	NonCancerChronicDerived	0	3.1197E-06	0	3.1197E-06	3.1197E-06	0	3.1197E-06	0	0	0	0	0	0	0	*	0.0024957	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
7			108883	Toluene	0.013976106	NonCancerChronicDerived	0	0.000046587	0	0	0	0.000046587	0.000046587	0	0	0	0	0	0	0	*	0.013976	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
8			127184	Perc	0.018468425	NonCancerChronicDerived	0	0	0	0.00052767	0.00052767	0	0	0	0	0	0	0	0	0	*	0.018468	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
9			1330207	Xylenes	0.016471839	NonCancerChronicDerived	0	0.000023531	0	0	0	0	0.000023531	0	0.000023531	0	0	0	0	0	*	0.016472	0	0	0	0	0	0	0	0	0	0	0	INHALATION			0	0	0
						0.0218	**0**	**0**	**0**	**0.000066553**	**0.000066553**	**0.000066553**	**0**	**0**	**0**	**0**	**0**	**0.00061353**	**0**	**0**	**0**	**0.0218066**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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HARP2 CSV Output Format Tool - Acute Risk Maxima

Residential

***HARP - HRACalc v16057 2/26/2016 8:43:49 PM - Acute Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1			67663	Chloroform	0.44418803	NonCancerAcute	0	0.0029613	0	0	0	0.0029613	0.0029613	0	0	0	0	0	0	0
2			71432	Benzene	0.040585708	NonCancerAcute	0	0	0.0015032	0	0	0.0015032	0	0	0	0	0	0.0015032	0	0
3			71556	1,1,1-TCA	1.222080773	NonCancerAcute	0	0.000017972	0	0	0	0	0	0	0	0	0	0	0	0
4			75092	Methylene Chlor	1.055228417	NonCancerAcute	0.000075373	0.000075373	0	0	0	0	0	0	0	0	0	0	0	0
5			79016	TCE	0.121757125	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6			106467	p-DiClBenzene	0.056369039	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7			108883	Toluene	0.311157097	NonCancerAcute	0	8.4097E-06	0	0	0	8.4097E-06	8.4097E-06	0	8.4097E-06	0	0	0	0	0
8			127184	Perc	0.410366606	NonCancerAcute	0	0.000020518	0	0	0	0	0.000020518	0	0.000020518	0	0	0	0	0
9			1330207	Xylenes	0.367526137	NonCancerAcute	0	0.000016706	0	0	0	0	0.000016706	0	0.000016706	0	0	0	0	0
						0.0045	**0**	**0.0029613**	**0.0015032**	**0**	**0**	**0.0044645**	**0.0029613**	**0**	**0**	**0**	**0**	**0.0015032**	**0**	**0**

Worker

***HARP - HRACalc v16057 2/26/2016 8:45:38 PM - Acute Risk**

INDEX	GRP1	GRP2	POLID	POLABBREV	CONC	SCENARIO	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1			67663	Chloroform	1.121598067	NonCancerAcute	0	0.0074773	0	0	0	0.0074773	0.0074773	0	0	0	0	0	0	0
2			71432	Benzene	0.102481042	NonCancerAcute	0	0	0.0037956	0	0	0.0037956	0	0	0	0	0	0.0037956	0	0
3			71556	1,1,1-TCA	3.085818032	NonCancerAcute	0	0.00004538	0	0	0	0	0	0	0	0	0	0	0	0
4			75092	Methylene Chlor	2.664507083	NonCancerAcute	0.00019032	0.00019032	0	0	0	0	0	0	0	0	0	0	0	0
5			79016	TCE	0.307443125	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6			106467	p-DiClBenzene	0.14233478	NonCancerAcute	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7			108883	Toluene	0.785687986	NonCancerAcute	0	0.000021235	0	0	0	0.000021235	0.000021235	0	0.000021235	0	0	0	0	0
8			127184	Perc	1.036197199	NonCancerAcute	0	0.00005181	0	0	0	0	0.00005181	0	0.00005181	0	0	0	0	0
9			1330207	Xylenes	0.928022766	NonCancerAcute	0	0.000042183	0	0	0	0	0.000042183	0	0.000042183	0	0	0	0	0
						0.0113	**0**	**0.0074773**	**0.0037956**	**0**	**0**	**0.0112729**	**0.0074773**	**0**	**0**	**0**	**0**	**0.0037956**	**0**	**0**

APPENDIX B – OPERATIONAL EMISSIONS ESTIMATES

Yorke ENGINEERING, LLC
www.YorkeEngr.com

Operational Data & Estimated Emissions

Pre-Project			
Parameter		**Value**	**Source Reference**
Annual Average Flowrate	—	2.7 MGD	BAAQMD Permit Description S-100
Peak Wet Weather Daily Flowrate	—	9.0 MGD	Las Gallinas Draft Project Description, page 1 of 5

Post-Project			
Parameter		**Value**	**Source Reference**
Annual Average Flowrate	—	3.2 MGD	Draft LGVSD Prelim. Design Technical Memorandum (Aqua Engineering, 8/14/2015)
Peak Wet Weather Daily Flowrate	—	18.0 MGD	Draft LGVSD Prelim. Design Technical Memorandum (Aqua Engineering, 8/14/2015)

Yorke ENGINEERING, LLC
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Operational Data & Estimated Emissions

Pollutant	CAS No.	EF	Source Reference	POC (Y/N)	POC EF
Methylene Chloride	75092	95 lb/year per MGD	80th Percentile Emission Factors http://hank.baaqmd.gov/pmt/handbook/rev02/PH_00_05_08_02.pdf	N	0 lb/year per MGD
Chloroform	67663	40 lb/year per MGD		Y	40 lb/year per MGD
1,1,1-TCA	71556	110 lb/year per MGD		N	0 lb/year per MGD
Benzene	71432	4 lb/year per MGD		Y	4 lb/year per MGD
TCE	79016	11 lb/year per MGD		Y	11 lb/year per MGD
Toluene	108883	28 lb/year per MGD		Y	28 lb/year per MGD
Tetrachloroethylene	127184	37 lb/year per MGD		Y	37 lb/year per MGD
Xylenes	1330207	33 lb/year per MGD		Y	33 lb/year per MGD
1,4-Dichlorobenzene	106467	5 lb/year per MGD		Y	5 lb/year per MGD
				Total POC EF	**158 lb/year per MGD**

Pre-Project			
Pollutant	**CAS No.**	**Daily Emissions**	**Annual Emissions**
POC	43104	3.89 lbs	425.8 lbs
Methylene Chloride	75092	2.34 lbs	256.5 lbs
Chloroform	67663	0.99 lbs	108.0 lbs
1,1,1-TCA	71556	2.71 lbs	297.0 lbs
Benzene	71432	0.09 lbs	10.0 lbs
TCE	79016	0.27 lbs	29.7 lbs
Toluene	108883	0.69 lbs	75.6 lbs
Tetrachloroethylene	127184	0.91 lbs	99.9 lbs
Xylenes	1330207	0.81 lbs	89.1 lbs
1,4-Dichlorobenzene	106467	0.12 lbs	13.5 lbs

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Operational Data & Estimated Emissions

Post-Project			
Pollutant	**CAS No.**	**Daily Emissions**	**Annual Emissions**
POC	43104	7.78 lbs	504.6 lbs
Methylene Chloride	75092	4.68 lbs	304.0 lbs
Chloroform	67663	1.97 lbs	128.0 lbs
1,1,1-TCA	71556	5.42 lbs	352.0 lbs
Benzene	71432	0.18 lbs	11.8 lbs
TCE	79016	0.54 lbs	35.2 lbs
Toluene	108883	1.38 lbs	89.6 lbs
Tetrachloroethylene	127184	1.82 lbs	118.4 lbs
Xylenes	1330207	1.63 lbs	105.6 lbs
1,4-Dichlorobenzene	106467	0.25 lbs	16.0 lbs

Net Increase in Emissions			
Pollutant	**CAS No.**	**Daily**	**Annually**
POC	43104	3.89 lbs	78.8 lbs
Methylene Chloride	75092	2.34 lbs	47.5 lbs
Chloroform	67663	0.98 lbs	20.0 lbs
1,1,1-TCA	71556	2.71 lbs	55.0 lbs
Benzene	71432	0.09 lbs	1.8 lbs
TCE	79016	0.27 lbs	5.5 lbs
Toluene	108883	0.69 lbs	14.0 lbs
Tetrachloroethylene	127184	0.91 lbs	18.5 lbs
Xylenes	1330207	0.82 lbs	16.5 lbs
1,4-Dichlorobenzene	106467	0.13 lbs	2.5 lbs

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Operational Data & Estimated Emissions

Post-Project Operational Emissions for Screening Risk Assessment					
TACs	CAS No.	Annual Avg	Daily Max	An. Avg.	Hr. Max.
		lbs/yr	lbs/day	g/sec	g/sec
Methylene Chloride	75092	304.00	4.68	4.38E-03	2.46E-02
Chloroform	67663	128.00	1.97	1.84E-03	1.04E-02
1,1,1-TCA	71556	352.00	5.42	5.07E-03	2.85E-02
Benzene	71432	11.80	0.18	1.70E-04	9.46E-04
TCE	79016	35.20	0.54	5.07E-04	2.84E-03
Toluene	108883	89.60	1.38	1.29E-03	7.25E-03
Tetrachloroethylene	127184	118.40	1.82	1.70E-03	9.56E-03
Xylenes	1330207	105.60	1.63	1.52E-03	8.57E-03
1,4-Dichlorobenzene	106467	16.00	0.25	2.30E-04	1.31E-03

APPENDIX C – MODEL OUTPUTS

Gallinas Phase 1

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	9.90	1000sqft	0.23	9,900.00	0
Other Non-Asphalt Surfaces	40.73	1000sqft	0.94	40,733.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Grading - Rev 1

Trips and VMT -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	75950	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	0
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	100	0
tblGrading	AcresOfGrading	1.50	1.17
tblGrading	AcresOfGrading	1.00	1.17
tblLandUse	LandUseSquareFeet	40,730.00	40,733.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	6.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	WorkerTripNumber	8.00	5.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.3716	2.4959	2.1189	3.2000e-003	0.0454	0.1661	0.2114	0.0126	0.1586	0.1712	0.0000	271.4526	271.4526	0.0533	0.0000	272.5728
Total	**0.3716**	**2.4959**	**2.1189**	**3.2000e-003**	**0.0454**	**0.1661**	**0.2114**	**0.0126**	**0.1586**	**0.1712**	**0.0000**	**271.4526**	**271.4526**	**0.0533**	**0.0000**	**272.5728**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.3716	2.4959	2.1189	3.2000e-003	0.0336	0.1661	0.1997	9.2200e-003	0.1586	0.1678	0.0000	271.4523	271.4523	0.0533	0.0000	272.5725
Total	**0.3716**	**2.4959**	**2.1189**	**3.2000e-003**	**0.0336**	**0.1661**	**0.1997**	**9.2200e-003**	**0.1586**	**0.1678**	**0.0000**	**271.4523**	**271.4523**	**0.0533**	**0.0000**	**272.5725**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**25.92**	**0.00**	**5.57**	**26.88**	**0.00**	**1.98**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2066	0.0000	4.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-004	9.0000e-004	0.0000	0.0000	9.6000e-004
Energy	1.3700e-003	0.0125	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	37.3846	37.3846	1.3400e-003	4.7000e-004	37.5588
Mobile	0.0324	0.0773	0.3298	8.0000e-004	0.0569	1.0900e-003	0.0580	0.0154	1.0000e-003	0.0164	0.0000	59.1839	59.1839	2.2700e-003	0.0000	59.2315
Waste						0.0000	0.0000		0.0000	0.0000	2.4927	0.0000	2.4927	0.1473	0.0000	5.5864
Water						0.0000	0.0000		0.0000	0.0000	0.7263	3.6038	4.3301	0.0748	1.8000e-003	6.4566
Total	**0.2404**	**0.0897**	**0.3408**	**8.7000e-004**	**0.0569**	**2.0400e-003**	**0.0590**	**0.0154**	**1.9500e-003**	**0.0173**	**3.2190**	**100.1731**	**103.3922**	**0.2257**	**2.2700e-003**	**108.8342**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2066	0.0000	4.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-004	9.0000e-004	0.0000	0.0000	9.6000e-004
Energy	1.3700e-003	0.0125	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	37.3846	37.3846	1.3400e-003	4.7000e-004	37.5588
Mobile	0.0324	0.0773	0.3298	8.0000e-004	0.0569	1.0900e-003	0.0580	0.0154	1.0000e-003	0.0164	0.0000	59.1839	59.1839	2.2700e-003	0.0000	59.2315
Waste						0.0000	0.0000		0.0000	0.0000	2.4927	0.0000	2.4927	0.1473	0.0000	5.5864
Water						0.0000	0.0000		0.0000	0.0000	0.7263	3.6038	4.3301	0.0748	1.7900e-003	6.4554
Total	**0.2404**	**0.0897**	**0.3408**	**8.7000e-004**	**0.0569**	**2.0400e-003**	**0.0590**	**0.0154**	**1.9500e-003**	**0.0173**	**3.2190**	**100.1731**	**103.3922**	**0.2257**	**2.2600e-003**	**108.8330**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.44**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2017	1/27/2017	5	20	
2	Site Preparation	Site Preparation	1/28/2017	1/31/2017	5	2	
3	Grading	Grading	2/1/2017	2/6/2017	5	4	
4	Building Construction	Building Construction	2/7/2017	11/13/2017	5	200	

Acres of Grading (Site Preparation Phase): 1.17

Acres of Grading (Grading Phase): 1.17

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	174	0.41
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	6.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	104.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	10.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	21.00	8.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.7100e-003	0.0000	1.7100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0121	0.1048	0.0858	1.2000e-004		7.2700e-003	7.2700e-003		6.9300e-003	6.9300e-003	0.0000	10.7394	10.7394	2.1200e-003	0.0000	10.7838
Total	**0.0121**	**0.1048**	**0.0858**	**1.2000e-004**	**0.0113**	**7.2700e-003**	**0.0185**	**1.7100e-003**	**6.9300e-003**	**8.6400e-003**	**0.0000**	**10.7394**	**10.7394**	**2.1200e-003**	**0.0000**	**10.7838**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2400e-003	0.0140	0.0155	4.0000e-005	8.7000e-004	1.7000e-004	1.0400e-003	2.4000e-004	1.6000e-004	4.0000e-004	0.0000	3.4397	3.4397	2.0000e-005	0.0000	3.4402
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	4.8000e-004	4.3900e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8008	0.8008	4.0000e-005	0.0000	0.8017
Total	**1.5800e-003**	**0.0144**	**0.0199**	**5.0000e-005**	**1.7700e-003**	**1.8000e-004**	**1.9500e-003**	**4.8000e-004**	**1.7000e-004**	**6.5000e-004**	**0.0000**	**4.2406**	**4.2406**	**6.0000e-005**	**0.0000**	**4.2419**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4000e-003	0.0000	4.4000e-003	6.7000e-004	0.0000	6.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0121	0.1048	0.0858	1.2000e-004		7.2700e-003	7.2700e-003		6.9300e-003	6.9300e-003	0.0000	10.7394	10.7394	2.1200e-003	0.0000	10.7838
Total	**0.0121**	**0.1048**	**0.0858**	**1.2000e-004**	**4.4000e-003**	**7.2700e-003**	**0.0117**	**6.7000e-004**	**6.9300e-003**	**7.6000e-003**	**0.0000**	**10.7394**	**10.7394**	**2.1200e-003**	**0.0000**	**10.7838**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2400e-003	0.0140	0.0155	4.0000e-005	8.7000e-004	1.7000e-004	1.0400e-003	2.4000e-004	1.6000e-004	4.0000e-004	0.0000	3.4397	3.4397	2.0000e-005	0.0000	3.4402
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	4.8000e-004	4.3900e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8008	0.8008	4.0000e-005	0.0000	0.8017
Total	**1.5800e-003**	**0.0144**	**0.0199**	**5.0000e-005**	**1.7700e-003**	**1.8000e-004**	**1.9500e-003**	**4.8000e-004**	**1.7000e-004**	**6.5000e-004**	**0.0000**	**4.2406**	**4.2406**	**6.0000e-005**	**0.0000**	**4.2419**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8900e-003	0.0000	5.8900e-003	2.9600e-003	0.0000	2.9600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3100e-003	0.0242	0.0159	2.0000e-005		1.3100e-003	1.3100e-003		1.2000e-003	1.2000e-003	0.0000	1.5895	1.5895	4.9000e-004	0.0000	1.5997
Total	**2.3100e-003**	**0.0242**	**0.0159**	**2.0000e-005**	**5.8900e-003**	**1.3100e-003**	**7.2000e-003**	**2.9600e-003**	**1.2000e-003**	**4.1600e-003**	**0.0000**	**1.5895**	**1.5895**	**4.9000e-004**	**0.0000**	**1.5997**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.2000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0400	0.0400	0.0000	0.0000	0.0401
Total	**2.0000e-005**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0400**	**0.0400**	**0.0000**	**0.0000**	**0.0401**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3000e-003	0.0000	2.3000e-003	1.1600e-003	0.0000	1.1600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3100e-003	0.0242	0.0159	2.0000e-005		1.3100e-003	1.3100e-003		1.2000e-003	1.2000e-003	0.0000	1.5895	1.5895	4.9000e-004	0.0000	1.5997
Total	**2.3100e-003**	**0.0242**	**0.0159**	**2.0000e-005**	**2.3000e-003**	**1.3100e-003**	**3.6100e-003**	**1.1600e-003**	**1.2000e-003**	**2.3600e-003**	**0.0000**	**1.5895**	**1.5895**	**4.9000e-004**	**0.0000**	**1.5997**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.2000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0400	0.0400	0.0000	0.0000	0.0401
Total	**2.0000e-005**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0400**	**0.0400**	**0.0000**	**0.0000**	**0.0401**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1300e-003	0.0000	2.1300e-003	8.9000e-004	0.0000	8.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8400e-003	0.0354	0.0244	3.0000e-005		2.2700e-003	2.2700e-003		2.1300e-003	2.1300e-003	0.0000	3.0155	3.0155	6.9000e-004	0.0000	3.0300
Total	**3.8400e-003**	**0.0354**	**0.0244**	**3.0000e-005**	**2.1300e-003**	**2.2700e-003**	**4.4000e-003**	**8.9000e-004**	**2.1300e-003**	**3.0200e-003**	**0.0000**	**3.0155**	**3.0155**	**6.9000e-004**	**0.0000**	**3.0300**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	1.0000e-004	8.8000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1602	0.1602	1.0000e-005	0.0000	0.1603
Total	**7.0000e-005**	**1.0000e-004**	**8.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1602**	**0.1602**	**1.0000e-005**	**0.0000**	**0.1603**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.3000e-004	0.0000	8.3000e-004	3.5000e-004	0.0000	3.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8400e-003	0.0354	0.0244	3.0000e-005		2.2700e-003	2.2700e-003		2.1300e-003	2.1300e-003	0.0000	3.0155	3.0155	6.9000e-004	0.0000	3.0300
Total	**3.8400e-003**	**0.0354**	**0.0244**	**3.0000e-005**	**8.3000e-004**	**2.2700e-003**	**3.1000e-003**	**3.5000e-004**	**2.1300e-003**	**2.4800e-003**	**0.0000**	**3.0155**	**3.0155**	**6.9000e-004**	**0.0000**	**3.0300**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	1.0000e-004	8.8000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1602	0.1602	1.0000e-005	0.0000	0.1603
Total	**7.0000e-005**	**1.0000e-004**	**8.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1602**	**0.1602**	**1.0000e-005**	**0.0000**	**0.1603**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3347	2.2360	1.7551	2.5600e-003		0.1539	0.1539		0.1471	0.1471	0.0000	218.1778	218.1778	0.0490	0.0000	219.2074
Total	**0.3347**	**2.2360**	**1.7551**	**2.5600e-003**		**0.1539**	**0.1539**		**0.1471**	**0.1471**	**0.0000**	**218.1778**	**218.1778**	**0.0490**	**0.0000**	**219.2074**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9600e-003	0.0708	0.1244	1.9000e-004	5.0900e-003	9.9000e-004	6.0800e-003	1.4600e-003	9.1000e-004	2.3700e-003	0.0000	16.6723	16.6723	1.3000e-004	0.0000	16.6750
Worker	7.1200e-003	0.0101	0.0922	2.3000e-004	0.0190	1.5000e-004	0.0191	5.0500e-003	1.4000e-004	5.1900e-003	0.0000	16.8173	16.8173	8.2000e-004	0.0000	16.8346
Total	**0.0171**	**0.0809**	**0.2166**	**4.2000e-004**	**0.0241**	**1.1400e-003**	**0.0252**	**6.5100e-003**	**1.0500e-003**	**7.5600e-003**	**0.0000**	**33.4897**	**33.4897**	**9.5000e-004**	**0.0000**	**33.5096**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3347	2.2360	1.7551	2.5600e-003		0.1539	0.1539		0.1471	0.1471	0.0000	218.1776	218.1776	0.0490	0.0000	219.2071
Total	**0.3347**	**2.2360**	**1.7551**	**2.5600e-003**		**0.1539**	**0.1539**		**0.1471**	**0.1471**	**0.0000**	**218.1776**	**218.1776**	**0.0490**	**0.0000**	**219.2071**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.9600e-003	0.0708	0.1244	1.9000e-004	5.0900e-003	9.9000e-004	6.0800e-003	1.4600e-003	9.1000e-004	2.3700e-003	0.0000	16.6723	16.6723	1.3000e-004	0.0000	16.6750
Worker	7.1200e-003	0.0101	0.0922	2.3000e-004	0.0190	1.5000e-004	0.0191	5.0500e-003	1.4000e-004	5.1900e-003	0.0000	16.8173	16.8173	8.2000e-004	0.0000	16.8346
Total	**0.0171**	**0.0809**	**0.2166**	**4.2000e-004**	**0.0241**	**1.1400e-003**	**0.0252**	**6.5100e-003**	**1.0500e-003**	**7.5600e-003**	**0.0000**	**33.4897**	**33.4897**	**9.5000e-004**	**0.0000**	**33.5096**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0324	0.0773	0.3298	8.0000e-004	0.0569	1.0900e-003	0.0580	0.0154	1.0000e-003	0.0164	0.0000	59.1839	59.1839	2.2700e-003	0.0000	59.2315
Unmitigated	0.0324	0.0773	0.3298	8.0000e-004	0.0569	1.0900e-003	0.0580	0.0154	1.0000e-003	0.0164	0.0000	59.1839	59.1839	2.2700e-003	0.0000	59.2315

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	69.00	13.07	6.73	152,154	152,154
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	69.00	13.07	6.73	152,154	152,154

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.545302	0.066455	0.182771	0.120923	0.034178	0.004114	0.013399	0.012410	0.001893	0.008250	0.007971	0.000727	0.001606

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	23.8178	23.8178	1.0800e-003	2.2000e-004	23.9095
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	23.8178	23.8178	1.0800e-003	2.2000e-004	23.9095
NaturalGas Mitigated	1.3700e-003	0.0125	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5668	13.5668	2.6000e-004	2.5000e-004	13.6494
NaturalGas Unmitigated	1.3700e-003	0.0125	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5668	13.5668	2.6000e-004	2.5000e-004	13.6494

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	254232	1.3700e-003	0.0125	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5668	13.5668	2.6000e-004	2.5000e-004	13.6494
Total		**1.3700e-003**	**0.0125**	**0.0105**	**7.0000e-005**		**9.5000e-004**	**9.5000e-004**		**9.5000e-004**	**9.5000e-004**	**0.0000**	**13.5668**	**13.5668**	**2.6000e-004**	**2.5000e-004**	**13.6494**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	254232	1.3700e-003	0.0125	0.0105	7.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.5668	13.5668	2.6000e-004	2.5000e-004	13.6494
Total		**1.3700e-003**	**0.0125**	**0.0105**	**7.0000e-005**		**9.5000e-004**	**9.5000e-004**		**9.5000e-004**	**9.5000e-004**	**0.0000**	**13.5668**	**13.5668**	**2.6000e-004**	**2.5000e-004**	**13.6494**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	81873	23.8178	1.0800e-003	2.2000e-004	23.9095
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**23.8178**	**1.0800e-003**	**2.2000e-004**	**23.9095**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	81873	23.8178	1.0800e-003	2.2000e-004	23.9095
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**23.8178**	**1.0800e-003**	**2.2000e-004**	**23.9095**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2066	0.0000	4.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-004	9.0000e-004	0.0000	0.0000	9.6000e-004
Unmitigated	0.2066	0.0000	4.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-004	9.0000e-004	0.0000	0.0000	9.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.8000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1978					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	4.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-004	9.0000e-004	0.0000	0.0000	9.6000e-004
Total	**0.2066**	**0.0000**	**4.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-004**	**9.0000e-004**	**0.0000**	**0.0000**	**9.6000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.8000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1978					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	4.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-004	9.0000e-004	0.0000	0.0000	9.6000e-004
Total	**0.2066**	**0.0000**	**4.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-004**	**9.0000e-004**	**0.0000**	**0.0000**	**9.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	4.3301	0.0748	1.7900e-003	6.4554
Unmitigated	4.3301	0.0748	1.8000e-003	6.4566

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	2.28938 / 0	4.3301	0.0748	1.8000e-003	6.4566
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**4.3301**	**0.0748**	**1.8000e-003**	**6.4566**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	2.28938 / 0	4.3301	0.0748	1.7900e-003	6.4554
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**4.3301**	**0.0748**	**1.7900e-003**	**6.4554**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.4927	0.1473	0.0000	5.5864
Unmitigated	2.4927	0.1473	0.0000	5.5864

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	12.28	2.4927	0.1473	0.0000	5.5864
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**2.4927**	**0.1473**	**0.0000**	**5.5864**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	12.28	2.4927	0.1473	0.0000	5.5864
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**2.4927**	**0.1473**	**0.0000**	**5.5864**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Gallinas Phase 1

Marin County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	9.90	1000sqft	0.23	9,900.00	0
Other Non-Asphalt Surfaces	40.73	1000sqft	0.94	40,733.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Grading - Rev 1

Trips and VMT -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	75950	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	0
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	100	0
tblGrading	AcresOfGrading	1.50	1.17
tblGrading	AcresOfGrading	1.00	1.17
tblLandUse	LandUseSquareFeet	40,730.00	40,733.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	6.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	WorkerTripNumber	8.00	5.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	3.5345	24.2547	19.9716	0.0297	5.9369	1.5505	7.2440	2.9759	1.4812	4.1785	0.0000	2,772.4163	2,772.4163	0.5509	0.0000	2,783.9857
Total	**3.5345**	**24.2547**	**19.9716**	**0.0297**	**5.9369**	**1.5505**	**7.2440**	**2.9759**	**1.4812**	**4.1785**	**0.0000**	**2,772.4163**	**2,772.4163**	**0.5509**	**0.0000**	**2,783.9857**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	3.5345	24.2547	19.9716	0.0297	2.3441	1.5505	3.6512	1.1683	1.4812	2.3708	0.0000	2,772.4163	2,772.4163	0.5509	0.0000	2,783.9857
Total	**3.5345**	**24.2547**	**19.9716**	**0.0297**	**2.3441**	**1.5505**	**3.6512**	**1.1683**	**1.4812**	**2.3708**	**0.0000**	**2,772.4163**	**2,772.4163**	**0.5509**	**0.0000**	**2,783.9857**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**60.52**	**0.00**	**49.60**	**60.74**	**0.00**	**43.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.1323	5.0000e-005	5.2400e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0111	0.0111	3.0000e-005		0.0117
Energy	7.5100e-003	0.0683	0.0574	4.1000e-004		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003		81.9442	81.9442	1.5700e-003	1.5000e-003	82.4429
Mobile	0.2517	0.5844	2.5691	5.7700e-003	0.4315	7.9400e-003	0.4394	0.1161	7.3100e-003	0.1234		473.1763	473.1763	0.0182		473.5583
Total	**1.3915**	**0.6528**	**2.6317**	**6.1800e-003**	**0.4315**	**0.0132**	**0.4446**	**0.1161**	**0.0125**	**0.1286**		**555.1316**	**555.1316**	**0.0198**	**1.5000e-003**	**556.0130**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.1323	5.0000e-005	5.2400e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0111	0.0111	3.0000e-005		0.0117
Energy	7.5100e-003	0.0683	0.0574	4.1000e-004		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003		81.9442	81.9442	1.5700e-003	1.5000e-003	82.4429
Mobile	0.2517	0.5844	2.5691	5.7700e-003	0.4315	7.9400e-003	0.4394	0.1161	7.3100e-003	0.1234		473.1763	473.1763	0.0182		473.5583
Total	**1.3915**	**0.6528**	**2.6317**	**6.1800e-003**	**0.4315**	**0.0132**	**0.4446**	**0.1161**	**0.0125**	**0.1286**		**555.1316**	**555.1316**	**0.0198**	**1.5000e-003**	**556.0130**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2017	1/27/2017	5	20	
2	Site Preparation	Site Preparation	1/28/2017	1/31/2017	5	2	
3	Grading	Grading	2/1/2017	2/6/2017	5	4	
4	Building Construction	Building Construction	2/7/2017	11/13/2017	5	200	

Acres of Grading (Site Preparation Phase): 1.17

Acres of Grading (Grading Phase): 1.17

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	174	0.41
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	6.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	104.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	10.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	21.00	8.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.1271	0.0000	1.1271	0.1707	0.0000	0.1707			0.0000			0.0000
Off-Road	1.2049	10.4761	8.5825	0.0120		0.7266	0.7266		0.6930	0.6930		1,183.813 1	1,183.813 1	0.2333		1,188.711 8
Total	**1.2049**	**10.4761**	**8.5825**	**0.0120**	**1.1271**	**0.7266**	**1.8537**	**0.1707**	**0.6930**	**0.8636**		**1,183.813 1**	**1,183.813 1**	**0.2333**		**1,188.711 8**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1340	1.4176	1.7567	3.8300e-003	0.0903	0.0174	0.1077	0.0247	0.0160	0.0407		378.6393	378.6393	2.7600e-003		378.6972
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0366	0.0519	0.4568	1.0900e-003	0.0943	7.2000e-004	0.0950	0.0250	6.6000e-004	0.0257		87.8445	87.8445	4.3200e-003		87.9352
Total	**0.1706**	**1.4695**	**2.2134**	**4.9200e-003**	**0.1846**	**0.0181**	**0.2027**	**0.0497**	**0.0167**	**0.0664**		**466.4838**	**466.4838**	**7.0800e-003**		**466.6325**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4396	0.0000	0.4396	0.0666	0.0000	0.0666			0.0000			0.0000
Off-Road	1.2049	10.4761	8.5825	0.0120		0.7266	0.7266		0.6930	0.6930	0.0000	1,183.8131	1,183.8131	0.2333		1,188.7118
Total	**1.2049**	**10.4761**	**8.5825**	**0.0120**	**0.4396**	**0.7266**	**1.1662**	**0.0666**	**0.6930**	**0.7595**	**0.0000**	**1,183.8131**	**1,183.8131**	**0.2333**		**1,188.7118**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1340	1.4176	1.7567	3.8300e-003	0.0903	0.0174	0.1077	0.0247	0.0160	0.0407		378.6393	378.6393	2.7600e-003		378.6972
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0366	0.0519	0.4568	1.0900e-003	0.0943	7.2000e-004	0.0950	0.0250	6.6000e-004	0.0257		87.8445	87.8445	4.3200e-003		87.9352
Total	**0.1706**	**1.4695**	**2.2134**	**4.9200e-003**	**0.1846**	**0.0181**	**0.2027**	**0.0497**	**0.0167**	**0.0664**		**466.4838**	**466.4838**	**7.0800e-003**		**466.6325**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.8897	0.0000	5.8897	2.9634	0.0000	2.9634			0.0000			0.0000
Off-Road	2.3109	24.2288	15.9299	0.0171		1.3067	1.3067		1.2022	1.2022		1,752.1239	1,752.1239	0.5369		1,763.3977
Total	**2.3109**	**24.2288**	**15.9299**	**0.0171**	**5.8897**	**1.3067**	**7.1965**	**2.9634**	**1.2022**	**4.1656**		**1,752.1239**	**1,752.1239**	**0.5369**		**1,763.3977**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0183	0.0259	0.2284	5.4000e-004	0.0472	3.6000e-004	0.0475	0.0125	3.3000e-004	0.0128		43.9223	43.9223	2.1600e-003		43.9676
Total	**0.0183**	**0.0259**	**0.2284**	**5.4000e-004**	**0.0472**	**3.6000e-004**	**0.0475**	**0.0125**	**3.3000e-004**	**0.0128**		**43.9223**	**43.9223**	**2.1600e-003**		**43.9676**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.2970	0.0000	2.2970	1.1557	0.0000	1.1557			0.0000			0.0000
Off-Road	2.3109	24.2288	15.9299	0.0171		1.3067	1.3067		1.2022	1.2022	0.0000	1,752.1239	1,752.1239	0.5369		1,763.3977
Total	**2.3109**	**24.2288**	**15.9299**	**0.0171**	**2.2970**	**1.3067**	**3.6037**	**1.1557**	**1.2022**	**2.3579**	**0.0000**	**1,752.1239**	**1,752.1239**	**0.5369**		**1,763.3977**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0183	0.0259	0.2284	5.4000e-004	0.0472	3.6000e-004	0.0475	0.0125	3.3000e-004	0.0128		43.9223	43.9223	2.1600e-003		43.9676
Total	**0.0183**	**0.0259**	**0.2284**	**5.4000e-004**	**0.0472**	**3.6000e-004**	**0.0475**	**0.0125**	**3.3000e-004**	**0.0128**		**43.9223**	**43.9223**	**2.1600e-003**		**43.9676**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.0630	0.0000	1.0630	0.4473	0.0000	0.4473			0.0000			0.0000
Off-Road	1.9193	17.7071	12.2110	0.0167		1.1328	1.1328		1.0667	1.0667		1,662.0142	1,662.0142	0.3798		1,669.9898
Total	**1.9193**	**17.7071**	**12.2110**	**0.0167**	**1.0630**	**1.1328**	**2.1957**	**0.4473**	**1.0667**	**1.5139**		**1,662.0142**	**1,662.0142**	**0.3798**		**1,669.9898**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0366	0.0519	0.4568	1.0900e-003	0.0943	7.2000e-004	0.0950	0.0250	6.6000e-004	0.0257		87.8445	87.8445	4.3200e-003		87.9352
Total	**0.0366**	**0.0519**	**0.4568**	**1.0900e-003**	**0.0943**	**7.2000e-004**	**0.0950**	**0.0250**	**6.6000e-004**	**0.0257**		**87.8445**	**87.8445**	**4.3200e-003**		**87.9352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4146	0.0000	0.4146	0.1744	0.0000	0.1744			0.0000			0.0000
Off-Road	1.9193	17.7071	12.2110	0.0167		1.1328	1.1328		1.0667	1.0667	0.0000	1,662.0142	1,662.0142	0.3798		1,669.9898
Total	**1.9193**	**17.7071**	**12.2110**	**0.0167**	**0.4146**	**1.1328**	**1.5473**	**0.1744**	**1.0667**	**1.2411**	**0.0000**	**1,662.0142**	**1,662.0142**	**0.3798**		**1,669.9898**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0366	0.0519	0.4568	1.0900e-003	0.0943	7.2000e-004	0.0950	0.0250	6.6000e-004	0.0257		87.8445	87.8445	4.3200e-003		87.9352
Total	**0.0366**	**0.0519**	**0.4568**	**1.0900e-003**	**0.0943**	**7.2000e-004**	**0.0950**	**0.0250**	**6.6000e-004**	**0.0257**		**87.8445**	**87.8445**	**4.3200e-003**		**87.9352**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3468	22.3602	17.5511	0.0256		1.5391	1.5391		1.4706	1.4706		2,404.998 8	2,404.998 8	0.5404		2,416.347 7
Total	**3.3468**	**22.3602**	**17.5511**	**0.0256**		**1.5391**	**1.5391**		**1.4706**	**1.4706**		**2,404.998 8**	**2,404.998 8**	**0.5404**		**2,416.347 7**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1110	0.7165	1.4614	1.8600e-003	0.0528	9.9700e-003	0.0627	0.0150	9.1600e-003	0.0242		182.9441	182.9441	1.4300e-003		182.9740
Worker	0.0768	0.1089	0.9592	2.2800e-003	0.1980	1.5000e-003	0.1995	0.0525	1.3800e-003	0.0539		184.4735	184.4735	9.0700e-003		184.6640
Total	**0.1878**	**0.8255**	**2.4205**	**4.1400e-003**	**0.2508**	**0.0115**	**0.2623**	**0.0675**	**0.0105**	**0.0781**		**367.4175**	**367.4175**	**0.0105**		**367.6380**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3468	22.3602	17.5511	0.0256		1.5391	1.5391		1.4706	1.4706	0.0000	2,404.9988	2,404.9988	0.5404		2,416.3477
Total	**3.3468**	**22.3602**	**17.5511**	**0.0256**		**1.5391**	**1.5391**		**1.4706**	**1.4706**	**0.0000**	**2,404.9988**	**2,404.9988**	**0.5404**		**2,416.3477**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1110	0.7165	1.4614	1.8600e-003	0.0528	9.9700e-003	0.0627	0.0150	9.1600e-003	0.0242		182.9441	182.9441	1.4300e-003		182.9740
Worker	0.0768	0.1089	0.9592	2.2800e-003	0.1980	1.5000e-003	0.1995	0.0525	1.3800e-003	0.0539		184.4735	184.4735	9.0700e-003		184.6640
Total	**0.1878**	**0.8255**	**2.4205**	**4.1400e-003**	**0.2508**	**0.0115**	**0.2623**	**0.0675**	**0.0105**	**0.0781**		**367.4175**	**367.4175**	**0.0105**		**367.6380**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2517	0.5844	2.5691	5.7700e-003	0.4315	7.9400e-003	0.4394	0.1161	7.3100e-003	0.1234		473.1763	473.1763	0.0182		473.5583
Unmitigated	0.2517	0.5844	2.5691	5.7700e-003	0.4315	7.9400e-003	0.4394	0.1161	7.3100e-003	0.1234		473.1763	473.1763	0.0182		473.5583

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	69.00	13.07	6.73	152,154	152,154
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	69.00	13.07	6.73	152,154	152,154

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.545302	0.066455	0.182771	0.120923	0.034178	0.004114	0.013399	0.012410	0.001893	0.008250	0.007971	0.000727	0.001606

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	7.5100e-003	0.0683	0.0574	4.1000e-004		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003		81.9442	81.9442	1.5700e-003	1.5000e-003	82.4429
NaturalGas Unmitigated	7.5100e-003	0.0683	0.0574	4.1000e-004		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003		81.9442	81.9442	1.5700e-003	1.5000e-003	82.4429

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	696.526	7.5100e-003	0.0683	0.0574	4.1000e-004		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003		81.9442	81.9442	1.5700e-003	1.5000e-003	82.4429
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**7.5100e-003**	**0.0683**	**0.0574**	**4.1000e-004**		**5.1900e-003**	**5.1900e-003**		**5.1900e-003**	**5.1900e-003**		**81.9442**	**81.9442**	**1.5700e-003**	**1.5000e-003**	**82.4429**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	0.696526	7.5100e-003	0.0683	0.0574	4.1000e-004		5.1900e-003	5.1900e-003		5.1900e-003	5.1900e-003		81.9442	81.9442	1.5700e-003	1.5000e-003	82.4429
Total		**7.5100e-003**	**0.0683**	**0.0574**	**4.1000e-004**		**5.1900e-003**	**5.1900e-003**		**5.1900e-003**	**5.1900e-003**		**81.9442**	**81.9442**	**1.5700e-003**	**1.5000e-003**	**82.4429**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.1323	5.0000e-005	5.2400e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0111	0.0111	3.0000e-005		0.0117
Unmitigated	1.1323	5.0000e-005	5.2400e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0111	0.0111	3.0000e-005		0.0117

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0482					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.0836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-004	5.0000e-005	5.2400e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0111	0.0111	3.0000e-005		0.0117
Total	**1.1323**	**5.0000e-005**	**5.2400e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0111**	**0.0111**	**3.0000e-005**		**0.0117**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0482					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.0836					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-004	5.0000e-005	5.2400e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0111	0.0111	3.0000e-005		0.0117
Total	**1.1323**	**5.0000e-005**	**5.2400e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0111**	**0.0111**	**3.0000e-005**		**0.0117**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Gallinas Phase 2

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	20.00	1000sqft	0.46	20,000.00	0
Other Asphalt Surfaces	25.00	1000sqft	0.57	25,000.00	0
Other Non-Asphalt Surfaces	44.33	1000sqft	1.02	44,333.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Grading - rev 1

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	134000	0
tblConstructionPhase	NumDays	3.00	4.00
tblConstructionPhase	PhaseEndDate	1/26/2018	1/27/2018
tblGrading	AcresOfGrading	3.00	2.05
tblGrading	AcresOfGrading	6.00	2.05
tblLandUse	LandUseSquareFeet	44,330.00	44,333.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	OperationalYear	2014	2019

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3803	2.6265	2.5040	4.0100e-003	0.0644	0.1612	0.2256	0.0167	0.1539	0.1706	0.0000	335.2908	335.2908	0.0602	0.0000	336.5549
Total	**0.3803**	**2.6265**	**2.5040**	**4.0100e-003**	**0.0644**	**0.1612**	**0.2256**	**0.0167**	**0.1539**	**0.1706**	**0.0000**	**335.2908**	**335.2908**	**0.0602**	**0.0000**	**336.5549**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3803	2.6265	2.5040	4.0100e-003	0.0564	0.1612	0.2176	0.0150	0.1539	0.1688	0.0000	335.2904	335.2904	0.0602	0.0000	336.5546
Total	**0.3803**	**2.6265**	**2.5040**	**4.0100e-003**	**0.0564**	**0.1612**	**0.2176**	**0.0150**	**0.1539**	**0.1688**	**0.0000**	**335.2904**	**335.2904**	**0.0602**	**0.0000**	**336.5546**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**12.45**	**0.00**	**3.55**	**10.26**	**0.00**	**1.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3645	1.0000e-005	8.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-003	1.6000e-003	0.0000	0.0000	1.6900e-003
Energy	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	75.5244	75.5244	2.7000e-003	9.5000e-004	75.8764
Mobile	0.0611	0.1426	0.6143	1.6100e-003	0.1150	2.0800e-003	0.1171	0.0311	1.9200e-003	0.0330	0.0000	115.7221	115.7221	4.2600e-003	0.0000	115.8116
Waste						0.0000	0.0000		0.0000	0.0000	5.0342	0.0000	5.0342	0.2975	0.0000	11.2819
Water						0.0000	0.0000		0.0000	0.0000	1.4673	7.2803	8.7476	0.1510	3.6300e-003	13.0436
Total	**0.4283**	**0.1678**	**0.6363**	**1.7600e-003**	**0.1150**	**3.9900e-003**	**0.1190**	**0.0311**	**3.8300e-003**	**0.0349**	**6.5015**	**198.5284**	**205.0299**	**0.4555**	**4.5800e-003**	**216.0153**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3645	1.0000e-005	8.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-003	1.6000e-003	0.0000	0.0000	1.6900e-003
Energy	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	75.5244	75.5244	2.7000e-003	9.5000e-004	75.8764
Mobile	0.0611	0.1426	0.6143	1.6100e-003	0.1150	2.0800e-003	0.1171	0.0311	1.9200e-003	0.0330	0.0000	115.7221	115.7221	4.2600e-003	0.0000	115.8116
Waste						0.0000	0.0000		0.0000	0.0000	5.0342	0.0000	5.0342	0.2975	0.0000	11.2819
Water						0.0000	0.0000		0.0000	0.0000	1.4673	7.2803	8.7476	0.1510	3.6200e-003	13.0413
Total	**0.4283**	**0.1678**	**0.6363**	**1.7600e-003**	**0.1150**	**3.9900e-003**	**0.1190**	**0.0311**	**3.8300e-003**	**0.0349**	**6.5015**	**198.5284**	**205.0299**	**0.4555**	**4.5700e-003**	**216.0129**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.22**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2018	1/27/2018	5	20	
2	Site Preparation	Site Preparation	1/28/2018	2/1/2018	5	4	
3	Grading	Grading	2/2/2018	2/9/2018	5	6	
4	Building Construction	Building Construction	2/10/2018	12/14/2018	5	220	
5	Paving	Paving	12/15/2018	12/28/2018	5	10	

Acres of Grading (Site Preparation Phase): 2.05

Acres of Grading (Grading Phase): 2.05

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Scrapers	1	8.00	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Paving Equipment	1	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	81.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	13.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	38.00	15.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.7100e-003	0.0000	8.7100e-003	1.3200e-003	0.0000	1.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.0932	0.0835	1.2000e-004		6.1400e-003	6.1400e-003		5.8600e-003	5.8600e-003	0.0000	10.6491	10.6491	2.0600e-003	0.0000	10.6923
Total	**0.0105**	**0.0932**	**0.0835**	**1.2000e-004**	**8.7100e-003**	**6.1400e-003**	**0.0149**	**1.3200e-003**	**5.8600e-003**	**7.1800e-003**	**0.0000**	**10.6491**	**10.6491**	**2.0600e-003**	**0.0000**	**10.6923**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.1000e-004	9.9000e-003	0.0115	3.0000e-005	6.8000e-004	1.3000e-004	8.1000e-004	1.9000e-004	1.2000e-004	3.1000e-004	0.0000	2.6352	2.6352	2.0000e-005	0.0000	2.6356
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.3000e-004	3.9100e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.7710	0.7710	4.0000e-005	0.0000	0.7718
Total	**1.2100e-003**	**0.0103**	**0.0155**	**4.0000e-005**	**1.5800e-003**	**1.4000e-004**	**1.7200e-003**	**4.3000e-004**	**1.3000e-004**	**5.6000e-004**	**0.0000**	**3.4062**	**3.4062**	**6.0000e-005**	**0.0000**	**3.4074**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.4000e-003	0.0000	3.4000e-003	5.1000e-004	0.0000	5.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.0932	0.0835	1.2000e-004		6.1400e-003	6.1400e-003		5.8600e-003	5.8600e-003	0.0000	10.6490	10.6490	2.0600e-003	0.0000	10.6923
Total	**0.0105**	**0.0932**	**0.0835**	**1.2000e-004**	**3.4000e-003**	**6.1400e-003**	**9.5400e-003**	**5.1000e-004**	**5.8600e-003**	**6.3700e-003**	**0.0000**	**10.6490**	**10.6490**	**2.0600e-003**	**0.0000**	**10.6923**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.1000e-004	9.9000e-003	0.0115	3.0000e-005	6.8000e-004	1.3000e-004	8.1000e-004	1.9000e-004	1.2000e-004	3.1000e-004	0.0000	2.6352	2.6352	2.0000e-005	0.0000	2.6356
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.3000e-004	3.9100e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.7710	0.7710	4.0000e-005	0.0000	0.7718
Total	**1.2100e-003**	**0.0103**	**0.0155**	**4.0000e-005**	**1.5800e-003**	**1.4000e-004**	**1.7200e-003**	**4.3000e-004**	**1.3000e-004**	**5.6000e-004**	**0.0000**	**3.4062**	**3.4062**	**6.0000e-005**	**0.0000**	**3.4074**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0900e-003	0.0000	1.0900e-003	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4500e-003	0.0498	0.0313	5.0000e-005		2.4100e-003	2.4100e-003		2.2100e-003	2.2100e-003	0.0000	4.4243	4.4243	1.3800e-003	0.0000	4.4532
Total	**4.4500e-003**	**0.0498**	**0.0313**	**5.0000e-005**	**1.0900e-003**	**2.4100e-003**	**3.5000e-003**	**1.2000e-004**	**2.2100e-003**	**2.3300e-003**	**0.0000**	**4.4243**	**4.4243**	**1.3800e-003**	**0.0000**	**4.4532**

3.3 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	7.0000e-005	6.3000e-004	0.0000	1.4000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1234	0.1234	1.0000e-005	0.0000	0.1235
Total	**5.0000e-005**	**7.0000e-005**	**6.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1234**	**0.1234**	**1.0000e-005**	**0.0000**	**0.1235**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2000e-004	0.0000	4.2000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4500e-003	0.0498	0.0313	5.0000e-005		2.4100e-003	2.4100e-003		2.2100e-003	2.2100e-003	0.0000	4.4243	4.4243	1.3800e-003	0.0000	4.4532
Total	**4.4500e-003**	**0.0498**	**0.0313**	**5.0000e-005**	**4.2000e-004**	**2.4100e-003**	**2.8300e-003**	**5.0000e-005**	**2.2100e-003**	**2.2600e-003**	**0.0000**	**4.4243**	**4.4243**	**1.3800e-003**	**0.0000**	**4.4532**

3.3 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	7.0000e-005	6.3000e-004	0.0000	1.4000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1234	0.1234	1.0000e-005	0.0000	0.1235
Total	**5.0000e-005**	**7.0000e-005**	**6.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1234**	**0.1234**	**1.0000e-005**	**0.0000**	**0.1235**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.3500e-003	0.0000	3.3500e-003	1.3600e-003	0.0000	1.3600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.6600e-003	0.0529	0.0391	5.0000e-005		3.2400e-003	3.2400e-003		3.0500e-003	3.0500e-003	0.0000	4.8979	4.8979	1.1500e-003	0.0000	4.9220
Total	**5.6600e-003**	**0.0529**	**0.0391**	**5.0000e-005**	**3.3500e-003**	**3.2400e-003**	**6.5900e-003**	**1.3600e-003**	**3.0500e-003**	**4.4100e-003**	**0.0000**	**4.8979**	**4.8979**	**1.1500e-003**	**0.0000**	**4.9220**

3.4 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	1.7000e-004	1.5300e-003	0.0000	3.5000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3007	0.3007	1.0000e-005	0.0000	0.3010
Total	**1.2000e-004**	**1.7000e-004**	**1.5300e-003**	**0.0000**	**3.5000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3007**	**0.3007**	**1.0000e-005**	**0.0000**	**0.3010**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3000e-003	0.0000	1.3000e-003	5.3000e-004	0.0000	5.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.6600e-003	0.0529	0.0391	5.0000e-005		3.2400e-003	3.2400e-003		3.0500e-003	3.0500e-003	0.0000	4.8979	4.8979	1.1500e-003	0.0000	4.9220
Total	**5.6600e-003**	**0.0529**	**0.0391**	**5.0000e-005**	**1.3000e-003**	**3.2400e-003**	**4.5400e-003**	**5.3000e-004**	**3.0500e-003**	**3.5800e-003**	**0.0000**	**4.8979**	**4.8979**	**1.1500e-003**	**0.0000**	**4.9220**

3.4 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	1.7000e-004	1.5300e-003	0.0000	3.5000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3007	0.3007	1.0000e-005	0.0000	0.3010
Total	**1.2000e-004**	**1.7000e-004**	**1.5300e-003**	**0.0000**	**3.5000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3007**	**0.3007**	**1.0000e-005**	**0.0000**	**0.3010**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3200	2.2129	1.8753	2.8100e-003		0.1439	0.1439		0.1377	0.1377	0.0000	238.0714	238.0714	0.0518	0.0000	239.1597
Total	**0.3200**	**2.2129**	**1.8753**	**2.8100e-003**		**0.1439**	**0.1439**		**0.1377**	**0.1377**	**0.0000**	**238.0714**	**238.0714**	**0.0518**	**0.0000**	**239.1597**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0188	0.1325	0.2415	3.8000e-004	0.0105	1.9000e-003	0.0124	3.0000e-003	1.7400e-003	4.7500e-003	0.0000	33.8052	33.8052	2.6000e-004	0.0000	33.8106
Worker	0.0127	0.0180	0.1636	4.6000e-004	0.0378	2.9000e-004	0.0381	0.0101	2.7000e-004	0.0103	0.0000	32.2282	32.2282	1.5100e-003	0.0000	32.2599
Total	**0.0315**	**0.1505**	**0.4052**	**8.4000e-004**	**0.0483**	**2.1900e-003**	**0.0505**	**0.0131**	**2.0100e-003**	**0.0151**	**0.0000**	**66.0334**	**66.0334**	**1.7700e-003**	**0.0000**	**66.0705**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3200	2.2129	1.8753	2.8100e-003		0.1439	0.1439		0.1377	0.1377	0.0000	238.0711	238.0711	0.0518	0.0000	239.1594
Total	**0.3200**	**2.2129**	**1.8753**	**2.8100e-003**		**0.1439**	**0.1439**		**0.1377**	**0.1377**	**0.0000**	**238.0711**	**238.0711**	**0.0518**	**0.0000**	**239.1594**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0188	0.1325	0.2415	3.8000e-004	0.0105	1.9000e-003	0.0124	3.0000e-003	1.7400e-003	4.7500e-003	0.0000	33.8052	33.8052	2.6000e-004	0.0000	33.8106
Worker	0.0127	0.0180	0.1636	4.6000e-004	0.0378	2.9000e-004	0.0381	0.0101	2.7000e-004	0.0103	0.0000	32.2282	32.2282	1.5100e-003	0.0000	32.2599
Total	**0.0315**	**0.1505**	**0.4052**	**8.4000e-004**	**0.0483**	**2.1900e-003**	**0.0505**	**0.0131**	**2.0100e-003**	**0.0151**	**0.0000**	**66.0334**	**66.0334**	**1.7700e-003**	**0.0000**	**66.0705**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7200e-003	0.0562	0.0481	8.0000e-005		3.1700e-003	3.1700e-003		2.9300e-003	2.9300e-003	0.0000	6.6134	6.6134	1.9200e-003	0.0000	6.6537
Paving	7.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.4700e-003**	**0.0562**	**0.0481**	**8.0000e-005**		**3.1700e-003**	**3.1700e-003**		**2.9300e-003**	**2.9300e-003**	**0.0000**	**6.6134**	**6.6134**	**1.9200e-003**	**0.0000**	**6.6537**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.3000e-004	3.9100e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.7710	0.7710	4.0000e-005	0.0000	0.7718
Total	**3.0000e-004**	**4.3000e-004**	**3.9100e-003**	**1.0000e-005**	**9.0000e-004**	**1.0000e-005**	**9.1000e-004**	**2.4000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.7710**	**0.7710**	**4.0000e-005**	**0.0000**	**0.7718**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7200e-003	0.0562	0.0481	8.0000e-005		3.1700e-003	3.1700e-003		2.9300e-003	2.9300e-003	0.0000	6.6134	6.6134	1.9200e-003	0.0000	6.6536
Paving	7.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.4700e-003**	**0.0562**	**0.0481**	**8.0000e-005**		**3.1700e-003**	**3.1700e-003**		**2.9300e-003**	**2.9300e-003**	**0.0000**	**6.6134**	**6.6134**	**1.9200e-003**	**0.0000**	**6.6536**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.3000e-004	3.9100e-003	1.0000e-005	9.0000e-004	1.0000e-005	9.1000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.7710	0.7710	4.0000e-005	0.0000	0.7718
Total	**3.0000e-004**	**4.3000e-004**	**3.9100e-003**	**1.0000e-005**	**9.0000e-004**	**1.0000e-005**	**9.1000e-004**	**2.4000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.7710**	**0.7710**	**4.0000e-005**	**0.0000**	**0.7718**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0611	0.1426	0.6143	1.6100e-003	0.1150	2.0800e-003	0.1171	0.0311	1.9200e-003	0.0330	0.0000	115.7221	115.7221	4.2600e-003	0.0000	115.8116
Unmitigated	0.0611	0.1426	0.6143	1.6100e-003	0.1150	2.0800e-003	0.1171	0.0311	1.9200e-003	0.0330	0.0000	115.7221	115.7221	4.2600e-003	0.0000	115.8116

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	139.40	26.40	13.60	307,383	307,383
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	139.40	26.40	13.60	307,383	307,383

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546125	0.066484	0.182879	0.120053	0.033988	0.004085	0.013389	0.012585	0.001893	0.008218	0.007984	0.000718	0.001600

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	48.1168	48.1168	2.1800e-003	4.5000e-004	48.3020
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	48.1168	48.1168	2.1800e-003	4.5000e-004	48.3020
NaturalGas Mitigated	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	27.4077	27.4077	5.3000e-004	5.0000e-004	27.5745
NaturalGas Unmitigated	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	27.4077	27.4077	5.3000e-004	5.0000e-004	27.5745

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	513600	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	27.4077	27.4077	5.3000e-004	5.0000e-004	27.5745
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**2.7700e-003**	**0.0252**	**0.0212**	**1.5000e-004**		**1.9100e-003**	**1.9100e-003**		**1.9100e-003**	**1.9100e-003**	**0.0000**	**27.4077**	**27.4077**	**5.3000e-004**	**5.0000e-004**	**27.5745**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	513600	2.7700e-003	0.0252	0.0212	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	27.4077	27.4077	5.3000e-004	5.0000e-004	27.5745
Total		**2.7700e-003**	**0.0252**	**0.0212**	**1.5000e-004**		**1.9100e-003**	**1.9100e-003**		**1.9100e-003**	**1.9100e-003**	**0.0000**	**27.4077**	**27.4077**	**5.3000e-004**	**5.0000e-004**	**27.5745**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	165400	48.1168	2.1800e-003	4.5000e-004	48.3020
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**48.1168**	**2.1800e-003**	**4.5000e-004**	**48.3020**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	165400	48.1168	2.1800e-003	4.5000e-004	48.3020
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**48.1168**	**2.1800e-003**	**4.5000e-004**	**48.3020**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3645	1.0000e-005	8.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-003	1.6000e-003	0.0000	0.0000	1.6900e-003
Unmitigated	0.3645	1.0000e-005	8.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-003	1.6000e-003	0.0000	0.0000	1.6900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0155					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3489					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-005	1.0000e-005	8.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-003	1.6000e-003	0.0000	0.0000	1.6900e-003
Total	**0.3645**	**1.0000e-005**	**8.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.6000e-003**	**1.6000e-003**	**0.0000**	**0.0000**	**1.6900e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0155					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3489					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-005	1.0000e-005	8.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.6000e-003	1.6000e-003	0.0000	0.0000	1.6900e-003
Total	**0.3645**	**1.0000e-005**	**8.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.6000e-003**	**1.6000e-003**	**0.0000**	**0.0000**	**1.6900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	8.7476	0.1510	3.6200e-003	13.0413
Unmitigated	8.7476	0.1510	3.6300e-003	13.0436

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	4.625 / 0	8.7476	0.1510	3.6300e-003	13.0436
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**8.7476**	**0.1510**	**3.6300e-003**	**13.0436**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	4.625 / 0	8.7476	0.1510	3.6200e-003	13.0413
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**8.7476**	**0.1510**	**3.6200e-003**	**13.0413**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5.0342	0.2975	0.0000	11.2819
Unmitigated	5.0342	0.2975	0.0000	11.2819

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	24.8	5.0342	0.2975	0.0000	11.2819
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**5.0342**	**0.2975**	**0.0000**	**11.2819**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	24.8	5.0342	0.2975	0.0000	11.2819
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**5.0342**	**0.2975**	**0.0000**	**11.2819**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Gallinas Phase 2

Marin County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	20.00	1000sqft	0.46	20,000.00	0
Other Asphalt Surfaces	25.00	1000sqft	0.57	25,000.00	0
Other Non-Asphalt Surfaces	44.33	1000sqft	1.02	44,333.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Grading - rev 1

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	134000	0
tblConstructionPhase	NumDays	3.00	4.00
tblConstructionPhase	PhaseEndDate	1/26/2018	1/27/2018
tblGrading	AcresOfGrading	3.00	2.05
tblGrading	AcresOfGrading	6.00	2.05
tblLandUse	LandUseSquareFeet	44,330.00	44,333.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	OperationalYear	2014	2019

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.2231	24.9368	21.1846	0.0332	1.2377	1.3281	2.3197	0.4854	1.2701	1.5022	0.0000	3,044.3123	3,044.3123	0.7623	0.0000	3,060.3207
Total	**3.2231**	**24.9368**	**21.1846**	**0.0332**	**1.2377**	**1.3281**	**2.3197**	**0.4854**	**1.2701**	**1.5022**	**0.0000**	**3,044.3123**	**3,044.3123**	**0.7623**	**0.0000**	**3,060.3207**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	3.2231	24.9368	21.1846	0.0332	0.5575	1.3281	1.7854	0.2092	1.2701	1.3933	0.0000	3,044.3123	3,044.3123	0.7623	0.0000	3,060.3207
Total	**3.2231**	**24.9368**	**21.1846**	**0.0332**	**0.5575**	**1.3281**	**1.7854**	**0.2092**	**1.2701**	**1.3933**	**0.0000**	**3,044.3123**	**3,044.3123**	**0.7623**	**0.0000**	**3,060.3207**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.96**	**0.00**	**23.03**	**56.91**	**0.00**	**7.25**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9977	9.0000e-005	9.2100e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0196	0.0196	5.0000e-005		0.0207
Energy	0.0152	0.1380	0.1159	8.3000e-004		0.0105	0.0105		0.0105	0.0105		165.5439	165.5439	3.1700e-003	3.0300e-003	166.5514
Mobile	0.4739	1.0789	4.7851	0.0117	0.8716	0.0152	0.8869	0.2345	0.0140	0.2485		925.2017	925.2017	0.0342		925.9208
Total	**2.4867**	**1.2169**	**4.9101**	**0.0125**	**0.8716**	**0.0257**	**0.8974**	**0.2345**	**0.0245**	**0.2590**		**1,090.7651**	**1,090.7651**	**0.0375**	**3.0300e-003**	**1,092.4928**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9977	9.0000e-005	9.2100e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0196	0.0196	5.0000e-005		0.0207
Energy	0.0152	0.1380	0.1159	8.3000e-004		0.0105	0.0105		0.0105	0.0105		165.5439	165.5439	3.1700e-003	3.0300e-003	166.5514
Mobile	0.4739	1.0789	4.7851	0.0117	0.8716	0.0152	0.8869	0.2345	0.0140	0.2485		925.2017	925.2017	0.0342		925.9208
Total	**2.4867**	**1.2169**	**4.9101**	**0.0125**	**0.8716**	**0.0257**	**0.8974**	**0.2345**	**0.0245**	**0.2590**		**1,090.7651**	**1,090.7651**	**0.0375**	**3.0300e-003**	**1,092.4928**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2018	1/27/2018	5	20	
2	Site Preparation	Site Preparation	1/28/2018	2/1/2018	5	4	
3	Grading	Grading	2/2/2018	2/9/2018	5	6	
4	Building Construction	Building Construction	2/10/2018	12/14/2018	5	220	
5	Paving	Paving	12/15/2018	12/28/2018	5	10	

Acres of Grading (Site Preparation Phase): 2.05

Acres of Grading (Grading Phase): 2.05

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Scrapers	1	8.00	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Paving Equipment	1	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	81.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	13.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	38.00	15.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8712	0.0000	0.8712	0.1319	0.0000	0.1319			0.0000			0.0000
Off-Road	1.0530	9.3216	8.3495	0.0120		0.6139	0.6139		0.5862	0.5862		1,173.856 5	1,173.856 5	0.2268		1,178.619 7
Total	**1.0530**	**9.3216**	**8.3495**	**0.0120**	**0.8712**	**0.6139**	**1.4851**	**0.1319**	**0.5862**	**0.7181**		**1,173.856 5**	**1,173.856 5**	**0.2268**		**1,178.619 7**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0981	1.0051	1.3119	2.9800e-003	0.0703	0.0134	0.0837	0.0192	0.0123	0.0316		290.0804	290.0804	2.1600e-003		290.1258
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0328	0.0467	0.4058	1.0900e-003	0.0943	6.9000e-004	0.0950	0.0250	6.4000e-004	0.0257		84.5736	84.5736	3.9700e-003		84.6570
Total	**0.1309**	**1.0518**	**1.7177**	**4.0700e-003**	**0.1646**	**0.0141**	**0.1787**	**0.0443**	**0.0130**	**0.0572**		**374.6540**	**374.6540**	**6.1300e-003**		**374.7829**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3398	0.0000	0.3398	0.0514	0.0000	0.0514			0.0000			0.0000
Off-Road	1.0530	9.3216	8.3495	0.0120		0.6139	0.6139		0.5862	0.5862	0.0000	1,173.8565	1,173.8565	0.2268		1,178.6197
Total	**1.0530**	**9.3216**	**8.3495**	**0.0120**	**0.3398**	**0.6139**	**0.9537**	**0.0514**	**0.5862**	**0.6376**	**0.0000**	**1,173.8565**	**1,173.8565**	**0.2268**		**1,178.6197**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0981	1.0051	1.3119	2.9800e-003	0.0703	0.0134	0.0837	0.0192	0.0123	0.0316		290.0804	290.0804	2.1600e-003		290.1258
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0328	0.0467	0.4058	1.0900e-003	0.0943	6.9000e-004	0.0950	0.0250	6.4000e-004	0.0257		84.5736	84.5736	3.9700e-003		84.6570
Total	**0.1309**	**1.0518**	**1.7177**	**4.0700e-003**	**0.1646**	**0.0141**	**0.1787**	**0.0443**	**0.0130**	**0.0572**		**374.6540**	**374.6540**	**6.1300e-003**		**374.7829**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5435	0.0000	0.5435	0.0587	0.0000	0.0587			0.0000			0.0000
Off-Road	2.2264	24.8994	15.6473	0.0242		1.2036	1.2036		1.1073	1.1073		2,438.4566	2,438.4566	0.7591		2,454.3982
Total	**2.2264**	**24.8994**	**15.6473**	**0.0242**	**0.5435**	**1.2036**	**1.7471**	**0.0587**	**1.1073**	**1.1660**		**2,438.4566**	**2,438.4566**	**0.7591**		**2,454.3982**

3.3 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0262	0.0374	0.3247	8.7000e-004	0.0754	5.5000e-004	0.0760	0.0200	5.1000e-004	0.0205		67.6589	67.6589	3.1800e-003		67.7256
Total	**0.0262**	**0.0374**	**0.3247**	**8.7000e-004**	**0.0754**	**5.5000e-004**	**0.0760**	**0.0200**	**5.1000e-004**	**0.0205**		**67.6589**	**67.6589**	**3.1800e-003**		**67.7256**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2120	0.0000	0.2120	0.0229	0.0000	0.0229			0.0000			0.0000
Off-Road	2.2264	24.8994	15.6473	0.0242		1.2036	1.2036		1.1073	1.1073	0.0000	2,438.4566	2,438.4566	0.7591		2,454.3982
Total	**2.2264**	**24.8994**	**15.6473**	**0.0242**	**0.2120**	**1.2036**	**1.4156**	**0.0229**	**1.1073**	**1.1302**	**0.0000**	**2,438.4566**	**2,438.4566**	**0.7591**		**2,454.3982**

3.3 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0262	0.0374	0.3247	8.7000e-004	0.0754	5.5000e-004	0.0760	0.0200	5.1000e-004	0.0205		67.6589	67.6589	3.1800e-003		67.7256
Total	**0.0262**	**0.0374**	**0.3247**	**8.7000e-004**	**0.0754**	**5.5000e-004**	**0.0760**	**0.0200**	**5.1000e-004**	**0.0205**		**67.6589**	**67.6589**	**3.1800e-003**		**67.7256**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.1151	0.0000	1.1151	0.4529	0.0000	0.4529			0.0000			0.0000
Off-Road	1.8851	17.6317	13.0170	0.0182		1.0811	1.0811		1.0160	1.0160		1,799.6669	1,799.6669	0.4216		1,808.5213
Total	**1.8851**	**17.6317**	**13.0170**	**0.0182**	**1.1151**	**1.0811**	**2.1962**	**0.4529**	**1.0160**	**1.4689**		**1,799.6669**	**1,799.6669**	**0.4216**		**1,808.5213**

3.4 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0426	0.0607	0.5276	1.4100e-003	0.1226	9.0000e-004	0.1235	0.0325	8.3000e-004	0.0334		109.9456	109.9456	5.1700e-003		110.0541
Total	**0.0426**	**0.0607**	**0.5276**	**1.4100e-003**	**0.1226**	**9.0000e-004**	**0.1235**	**0.0325**	**8.3000e-004**	**0.0334**		**109.9456**	**109.9456**	**5.1700e-003**		**110.0541**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4349	0.0000	0.4349	0.1766	0.0000	0.1766			0.0000			0.0000
Off-Road	1.8851	17.6317	13.0170	0.0182		1.0811	1.0811		1.0160	1.0160	0.0000	1,799.6669	1,799.6669	0.4216		1,808.5213
Total	**1.8851**	**17.6317**	**13.0170**	**0.0182**	**0.4349**	**1.0811**	**1.5160**	**0.1766**	**1.0160**	**1.1926**	**0.0000**	**1,799.6669**	**1,799.6669**	**0.4216**		**1,808.5213**

3.4 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0426	0.0607	0.5276	1.4100e-003	0.1226	9.0000e-004	0.1235	0.0325	8.3000e-004	0.0334		109.9456	109.9456	5.1700e-003		110.0541
Total	**0.0426**	**0.0607**	**0.5276**	**1.4100e-003**	**0.1226**	**9.0000e-004**	**0.1235**	**0.0325**	**8.3000e-004**	**0.0334**		**109.9456**	**109.9456**	**5.1700e-003**		**110.0541**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9093	20.1170	17.0482	0.0256		1.3081	1.3081		1.2517	1.2517		2,385.7165	2,385.7165	0.5193		2,396.6219
Total	**2.9093**	**20.1170**	**17.0482**	**0.0256**		**1.3081**	**1.3081**		**1.2517**	**1.2517**		**2,385.7165**	**2,385.7165**	**0.5193**		**2,396.6219**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1893	1.2183	2.5943	3.4900e-003	0.0989	0.0174	0.1163	0.0281	0.0160	0.0441		337.2163	337.2163	2.6300e-003		337.2716
Worker	0.1245	0.1776	1.5422	4.1300e-003	0.3584	2.6300e-003	0.3610	0.0950	2.4300e-003	0.0975		321.3795	321.3795	0.0151		321.6967
Total	**0.3138**	**1.3958**	**4.1364**	**7.6200e-003**	**0.4573**	**0.0200**	**0.4772**	**0.1232**	**0.0184**	**0.1416**		**658.5958**	**658.5958**	**0.0177**		**658.9683**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9093	20.1170	17.0482	0.0256		1.3081	1.3081		1.2517	1.2517	0.0000	2,385.7165	2,385.7165	0.5193		2,396.6219
Total	**2.9093**	**20.1170**	**17.0482**	**0.0256**		**1.3081**	**1.3081**		**1.2517**	**1.2517**	**0.0000**	**2,385.7165**	**2,385.7165**	**0.5193**		**2,396.6219**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1893	1.2183	2.5943	3.4900e-003	0.0989	0.0174	0.1163	0.0281	0.0160	0.0441		337.2163	337.2163	2.6300e-003		337.2716
Worker	0.1245	0.1776	1.5422	4.1300e-003	0.3584	2.6300e-003	0.3610	0.0950	2.4300e-003	0.0975		321.3795	321.3795	0.0151		321.6967
Total	**0.3138**	**1.3958**	**4.1364**	**7.6200e-003**	**0.4573**	**0.0200**	**0.4772**	**0.1232**	**0.0184**	**0.1416**		**658.5958**	**658.5958**	**0.0177**		**658.9683**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1434	11.2416	9.6232	0.0151		0.6332	0.6332		0.5860	0.5860		1,458.0074	1,458.0074	0.4225		1,466.8789
Paving	0.1493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2927**	**11.2416**	**9.6232**	**0.0151**		**0.6332**	**0.6332**		**0.5860**	**0.5860**		**1,458.0074**	**1,458.0074**	**0.4225**		**1,466.8789**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0655	0.0935	0.8117	2.1700e-003	0.1886	1.3800e-003	0.1900	0.0500	1.2800e-003	0.0513		169.1471	169.1471	7.9500e-003		169.3141
Total	**0.0655**	**0.0935**	**0.8117**	**2.1700e-003**	**0.1886**	**1.3800e-003**	**0.1900**	**0.0500**	**1.2800e-003**	**0.0513**		**169.1471**	**169.1471**	**7.9500e-003**		**169.3141**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1434	11.2416	9.6232	0.0151		0.6332	0.6332		0.5860	0.5860	0.0000	1,458.0074	1,458.0074	0.4225		1,466.8789
Paving	0.1493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2927**	**11.2416**	**9.6232**	**0.0151**		**0.6332**	**0.6332**		**0.5860**	**0.5860**	**0.0000**	**1,458.0074**	**1,458.0074**	**0.4225**		**1,466.8789**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0655	0.0935	0.8117	2.1700e-003	0.1886	1.3800e-003	0.1900	0.0500	1.2800e-003	0.0513		169.1471	169.1471	7.9500e-003		169.3141
Total	**0.0655**	**0.0935**	**0.8117**	**2.1700e-003**	**0.1886**	**1.3800e-003**	**0.1900**	**0.0500**	**1.2800e-003**	**0.0513**		**169.1471**	**169.1471**	**7.9500e-003**		**169.3141**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4739	1.0789	4.7851	0.0117	0.8716	0.0152	0.8869	0.2345	0.0140	0.2485		925.2017	925.2017	0.0342		925.9208
Unmitigated	0.4739	1.0789	4.7851	0.0117	0.8716	0.0152	0.8869	0.2345	0.0140	0.2485		925.2017	925.2017	0.0342		925.9208

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	139.40	26.40	13.60	307,383	307,383
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	139.40	26.40	13.60	307,383	307,383

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546125	0.066484	0.182879	0.120053	0.033988	0.004085	0.013389	0.012585	0.001893	0.008218	0.007984	0.000718	0.001600

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0152	0.1380	0.1159	8.3000e-004		0.0105	0.0105		0.0105	0.0105		165.5439	165.5439	3.1700e-003	3.0300e-003	166.5514
NaturalGas Unmitigated	0.0152	0.1380	0.1159	8.3000e-004		0.0105	0.0105		0.0105	0.0105		165.5439	165.5439	3.1700e-003	3.0300e-003	166.5514

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	1407.12	0.0152	0.1380	0.1159	8.3000e-004		0.0105	0.0105		0.0105	0.0105		165.5439	165.5439	3.1700e-003	3.0300e-003	166.5514
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0152**	**0.1380**	**0.1159**	**8.3000e-004**		**0.0105**	**0.0105**		**0.0105**	**0.0105**		**165.5439**	**165.5439**	**3.1700e-003**	**3.0300e-003**	**166.5514**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	1.40712	0.0152	0.1380	0.1159	8.3000e-004		0.0105	0.0105		0.0105	0.0105		165.5439	165.5439	3.1700e-003	3.0300e-003	166.5514
Total		**0.0152**	**0.1380**	**0.1159**	**8.3000e-004**		**0.0105**	**0.0105**		**0.0105**	**0.0105**		**165.5439**	**165.5439**	**3.1700e-003**	**3.0300e-003**	**166.5514**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9977	9.0000e-005	9.2100e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0196	0.0196	5.0000e-005		0.0207
Unmitigated	1.9977	9.0000e-005	9.2100e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0196	0.0196	5.0000e-005		0.0207

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0851					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9117					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.7000e-004	9.0000e-005	9.2100e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0196	0.0196	5.0000e-005		0.0207
Total	**1.9977**	**9.0000e-005**	**9.2100e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**		**0.0196**	**0.0196**	**5.0000e-005**		**0.0207**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0851					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9117					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.7000e-004	9.0000e-005	9.2100e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0196	0.0196	5.0000e-005		0.0207
Total	**1.9977**	**9.0000e-005**	**9.2100e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**		**0.0196**	**0.0196**	**5.0000e-005**		**0.0207**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Gallinas Phase 3

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	33.50	1000sqft	0.77	33,500.00	0
Other Non-Asphalt Surfaces	44.33	1000sqft	1.02	44,333.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - 2019 calendar

Demolition -

Construction Off-road Equipment Mitigation -

Grading - rev 1

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	19.00
tblConstructionPhase	PhaseEndDate	1/25/2019	1/27/2019
tblConstructionPhase	PhaseEndDate	2/4/2019	2/6/2019
tblConstructionPhase	PhaseStartDate	1/30/2019	2/1/2019
tblGrading	AcresOfGrading	1.50	1.79
tblGrading	AcresOfGrading	1.00	1.79
tblLandUse	LandUseSquareFeet	44,330.00	44,333.00
tblProjectCharacteristics	OperationalYear	2014	2020

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2759	1.9600	1.8742	3.1700e-003	0.0612	0.1070	0.1683	0.0196	0.1028	0.1225	0.0000	260.3060	260.3060	0.0429	0.0000	261.2060
Total	**0.2759**	**1.9600**	**1.8742**	**3.1700e-003**	**0.0612**	**0.1070**	**0.1683**	**0.0196**	**0.1028**	**0.1225**	**0.0000**	**260.3060**	**260.3060**	**0.0429**	**0.0000**	**261.2060**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2759	1.9600	1.8742	3.1700e-003	0.0482	0.1070	0.1552	0.0142	0.1028	0.1171	0.0000	260.3057	260.3057	0.0429	0.0000	261.2058
Total	**0.2759**	**1.9600**	**1.8742**	**3.1700e-003**	**0.0482**	**0.1070**	**0.1552**	**0.0142**	**0.1028**	**0.1171**	**0.0000**	**260.3057**	**260.3057**	**0.0429**	**0.0000**	**261.2058**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**21.28**	**0.00**	**7.74**	**27.52**	**0.00**	**4.41**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3446	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.3900e-003	1.3900e-003	0.0000	0.0000	1.4700e-003
Energy	4.6400e-003	0.0422	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	126.5034	126.5034	4.5200e-003	1.6000e-003	127.0930
Mobile	0.0969	0.2203	0.9646	2.6900e-003	0.1926	3.3700e-003	0.1960	0.0520	3.1100e-003	0.0551	0.0000	186.9092	186.9092	6.7400e-003	0.0000	187.0507
Waste						0.0000	0.0000		0.0000	0.0000	8.4322	0.0000	8.4322	0.4983	0.0000	18.8972
Water						0.0000	0.0000		0.0000	0.0000	2.4577	12.1945	14.6523	0.2530	6.0700e-003	21.8480
Total	**0.4462**	**0.2625**	**1.0007**	**2.9400e-003**	**0.1926**	**6.5700e-003**	**0.1992**	**0.0520**	**6.3100e-003**	**0.0583**	**10.8900**	**325.6085**	**336.4985**	**0.7626**	**7.6700e-003**	**354.8904**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3446	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.3900e-003	1.3900e-003	0.0000	0.0000	1.4700e-003
Energy	4.6400e-003	0.0422	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	126.5034	126.5034	4.5200e-003	1.6000e-003	127.0930
Mobile	0.0969	0.2203	0.9646	2.6900e-003	0.1926	3.3700e-003	0.1960	0.0520	3.1100e-003	0.0551	0.0000	186.9092	186.9092	6.7400e-003	0.0000	187.0507
Waste						0.0000	0.0000		0.0000	0.0000	8.4322	0.0000	8.4322	0.4983	0.0000	18.8972
Water						0.0000	0.0000		0.0000	0.0000	2.4577	12.1945	14.6523	0.2529	6.0700e-003	21.8441
Total	**0.4462**	**0.2625**	**1.0007**	**2.9400e-003**	**0.1926**	**6.5700e-003**	**0.1992**	**0.0520**	**6.3100e-003**	**0.0583**	**10.8900**	**325.6085**	**336.4985**	**0.7625**	**7.6700e-003**	**354.8865**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/27/2019	5	19	
2	Site Preparation	Site Preparation	1/28/2019	1/29/2019	5	2	
3	Grading	Grading	2/1/2019	2/6/2019	5	4	
4	Building Construction	Building Construction	2/7/2019	11/13/2019	5	200	

Acres of Grading (Site Preparation Phase): 1.79

Acres of Grading (Grading Phase): 1.79

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	48.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	33.00	13.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.1700e-003	0.0000	5.1700e-003	7.8000e-004	0.0000	7.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.2057	0.1819	2.3000e-004		0.0115	0.0115		0.0107	0.0107	0.0000	20.6621	20.6621	5.2800e-003	0.0000	20.7730
Total	**0.0208**	**0.2057**	**0.1819**	**2.3000e-004**	**5.1700e-003**	**0.0115**	**0.0166**	**7.8000e-004**	**0.0107**	**0.0115**	**0.0000**	**20.6621**	**20.6621**	**5.2800e-003**	**0.0000**	**20.7730**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1000e-004	5.4100e-003	6.5800e-003	2.0000e-005	4.0000e-004	8.0000e-005	4.8000e-004	1.1000e-004	7.0000e-005	1.8000e-004	0.0000	1.5363	1.5363	1.0000e-005	0.0000	1.5366
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	4.8000e-004	4.3600e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.9178	0.9178	4.0000e-005	0.0000	0.9187
Total	**8.5000e-004**	**5.8900e-003**	**0.0109**	**3.0000e-005**	**1.5200e-003**	**9.0000e-005**	**1.6100e-003**	**4.1000e-004**	**8.0000e-005**	**4.8000e-004**	**0.0000**	**2.4542**	**2.4542**	**5.0000e-005**	**0.0000**	**2.4553**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0200e-003	0.0000	2.0200e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.2057	0.1819	2.3000e-004		0.0115	0.0115		0.0107	0.0107	0.0000	20.6620	20.6620	5.2800e-003	0.0000	20.7729
Total	**0.0208**	**0.2057**	**0.1819**	**2.3000e-004**	**2.0200e-003**	**0.0115**	**0.0135**	**3.1000e-004**	**0.0107**	**0.0110**	**0.0000**	**20.6620**	**20.6620**	**5.2800e-003**	**0.0000**	**20.7729**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1000e-004	5.4100e-003	6.5800e-003	2.0000e-005	4.0000e-004	8.0000e-005	4.8000e-004	1.1000e-004	7.0000e-005	1.8000e-004	0.0000	1.5363	1.5363	1.0000e-005	0.0000	1.5366
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	4.8000e-004	4.3600e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.9178	0.9178	4.0000e-005	0.0000	0.9187
Total	**8.5000e-004**	**5.8900e-003**	**0.0109**	**3.0000e-005**	**1.5200e-003**	**9.0000e-005**	**1.6100e-003**	**4.1000e-004**	**8.0000e-005**	**4.8000e-004**	**0.0000**	**2.4542**	**2.4542**	**5.0000e-005**	**0.0000**	**2.4553**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.2200e-003	0.0000	6.2200e-003	3.0000e-003	0.0000	3.0000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9000e-003	0.0196	0.0144	2.0000e-005		1.0200e-003	1.0200e-003		9.4000e-004	9.4000e-004	0.0000	1.5375	1.5375	4.9000e-004	0.0000	1.5477
Total	**1.9000e-003**	**0.0196**	**0.0144**	**2.0000e-005**	**6.2200e-003**	**1.0200e-003**	**7.2400e-003**	**3.0000e-003**	**9.4000e-004**	**3.9400e-003**	**0.0000**	**1.5375**	**1.5375**	**4.9000e-004**	**0.0000**	**1.5477**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	3.0000e-005	2.8000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0595	0.0595	0.0000	0.0000	0.0595
Total	**2.0000e-005**	**3.0000e-005**	**2.8000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0595**	**0.0595**	**0.0000**	**0.0000**	**0.0595**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4300e-003	0.0000	2.4300e-003	1.1700e-003	0.0000	1.1700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9000e-003	0.0196	0.0144	2.0000e-005		1.0200e-003	1.0200e-003		9.4000e-004	9.4000e-004	0.0000	1.5375	1.5375	4.9000e-004	0.0000	1.5477
Total	**1.9000e-003**	**0.0196**	**0.0144**	**2.0000e-005**	**2.4300e-003**	**1.0200e-003**	**3.4500e-003**	**1.1700e-003**	**9.4000e-004**	**2.1100e-003**	**0.0000**	**1.5375**	**1.5375**	**4.9000e-004**	**0.0000**	**1.5477**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	3.0000e-005	2.8000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0595	0.0595	0.0000	0.0000	0.0595
Total	**2.0000e-005**	**3.0000e-005**	**2.8000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0595**	**0.0595**	**0.0000**	**0.0000**	**0.0595**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.9800e-003	0.0000	9.9800e-003	5.0700e-003	0.0000	5.0700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1000e-003	0.0320	0.0237	3.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	2.5260	2.5260	8.0000e-004	0.0000	2.5428
Total	**3.1000e-003**	**0.0320**	**0.0237**	**3.0000e-005**	**9.9800e-003**	**1.6700e-003**	**0.0117**	**5.0700e-003**	**1.5400e-003**	**6.6100e-003**	**0.0000**	**2.5260**	**2.5260**	**8.0000e-004**	**0.0000**	**2.5428**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	6.0000e-005	5.7000e-004	0.0000	1.4000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1189	0.1189	1.0000e-005	0.0000	0.1190
Total	**4.0000e-005**	**6.0000e-005**	**5.7000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1189**	**0.1189**	**1.0000e-005**	**0.0000**	**0.1190**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.8900e-003	0.0000	3.8900e-003	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1000e-003	0.0320	0.0237	3.0000e-005		1.6700e-003	1.6700e-003		1.5400e-003	1.5400e-003	0.0000	2.5260	2.5260	8.0000e-004	0.0000	2.5428
Total	**3.1000e-003**	**0.0320**	**0.0237**	**3.0000e-005**	**3.8900e-003**	**1.6700e-003**	**5.5600e-003**	**1.9800e-003**	**1.5400e-003**	**3.5200e-003**	**0.0000**	**2.5260**	**2.5260**	**8.0000e-004**	**0.0000**	**2.5428**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	6.0000e-005	5.7000e-004	0.0000	1.4000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1189	0.1189	1.0000e-005	0.0000	0.1190
Total	**4.0000e-005**	**6.0000e-005**	**5.7000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1189**	**0.1189**	**1.0000e-005**	**0.0000**	**0.1190**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2264	1.5883	1.3450	2.2000e-003		0.0912	0.0912		0.0881	0.0881	0.0000	182.2307	182.2307	0.0349	0.0000	182.9642
Total	**0.2264**	**1.5883**	**1.3450**	**2.2000e-003**		**0.0912**	**0.0912**		**0.0881**	**0.0881**	**0.0000**	**182.2307**	**182.2307**	**0.0349**	**0.0000**	**182.9642**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0136	0.0956	0.1810	3.0000e-004	8.2800e-003	1.3900e-003	9.6700e-003	2.3700e-003	1.2800e-003	3.6500e-003	0.0000	26.1922	26.1922	2.0000e-004	0.0000	26.1963
Worker	9.1500e-003	0.0129	0.1165	3.6000e-004	0.0298	2.2000e-004	0.0301	7.9400e-003	2.1000e-004	8.1500e-003	0.0000	24.5250	24.5250	1.1100e-003	0.0000	24.5483
Total	**0.0228**	**0.1085**	**0.2975**	**6.6000e-004**	**0.0381**	**1.6100e-003**	**0.0397**	**0.0103**	**1.4900e-003**	**0.0118**	**0.0000**	**50.7172**	**50.7172**	**1.3100e-003**	**0.0000**	**50.7446**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2264	1.5883	1.3450	2.2000e-003		0.0912	0.0912		0.0881	0.0881	0.0000	182.2305	182.2305	0.0349	0.0000	182.9640
Total	**0.2264**	**1.5883**	**1.3450**	**2.2000e-003**		**0.0912**	**0.0912**		**0.0881**	**0.0881**	**0.0000**	**182.2305**	**182.2305**	**0.0349**	**0.0000**	**182.9640**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0136	0.0956	0.1810	3.0000e-004	8.2800e-003	1.3900e-003	9.6700e-003	2.3700e-003	1.2800e-003	3.6500e-003	0.0000	26.1922	26.1922	2.0000e-004	0.0000	26.1963
Worker	9.1500e-003	0.0129	0.1165	3.6000e-004	0.0298	2.2000e-004	0.0301	7.9400e-003	2.1000e-004	8.1500e-003	0.0000	24.5250	24.5250	1.1100e-003	0.0000	24.5483
Total	**0.0228**	**0.1085**	**0.2975**	**6.6000e-004**	**0.0381**	**1.6100e-003**	**0.0397**	**0.0103**	**1.4900e-003**	**0.0118**	**0.0000**	**50.7172**	**50.7172**	**1.3100e-003**	**0.0000**	**50.7446**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0969	0.2203	0.9646	2.6900e-003	0.1926	3.3700e-003	0.1960	0.0520	3.1100e-003	0.0551	0.0000	186.9092	186.9092	6.7400e-003	0.0000	187.0507
Unmitigated	0.0969	0.2203	0.9646	2.6900e-003	0.1926	3.3700e-003	0.1960	0.0520	3.1100e-003	0.0551	0.0000	186.9092	186.9092	6.7400e-003	0.0000	187.0507

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	233.50	44.22	22.78	514,866	514,866
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	233.50	44.22	22.78	514,866	514,866

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546553	0.066568	0.183016	0.119431	0.033835	0.004061	0.013378	0.012756	0.001897	0.008192	0.008006	0.000710	0.001596

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	80.5956	80.5956	3.6400e-003	7.5000e-004	80.9058
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	80.5956	80.5956	3.6400e-003	7.5000e-004	80.9058
NaturalGas Mitigated	4.6400e-003	0.0422	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.9078	45.9078	8.8000e-004	8.4000e-004	46.1872
NaturalGas Unmitigated	4.6400e-003	0.0422	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.9078	45.9078	8.8000e-004	8.4000e-004	46.1872

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	860280	4.6400e-003	0.0422	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.9078	45.9078	8.8000e-004	8.4000e-004	46.1872
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**4.6400e-003**	**0.0422**	**0.0354**	**2.5000e-004**		**3.2000e-003**	**3.2000e-003**		**3.2000e-003**	**3.2000e-003**	**0.0000**	**45.9078**	**45.9078**	**8.8000e-004**	**8.4000e-004**	**46.1872**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	860280	4.6400e-003	0.0422	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.9078	45.9078	8.8000e-004	8.4000e-004	46.1872
Total		**4.6400e-003**	**0.0422**	**0.0354**	**2.5000e-004**		**3.2000e-003**	**3.2000e-003**		**3.2000e-003**	**3.2000e-003**	**0.0000**	**45.9078**	**45.9078**	**8.8000e-004**	**8.4000e-004**	**46.1872**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	277045	80.5956	3.6400e-003	7.5000e-004	80.9058
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**80.5956**	**3.6400e-003**	**7.5000e-004**	**80.9058**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	277045	80.5956	3.6400e-003	7.5000e-004	80.9058
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**80.5956**	**3.6400e-003**	**7.5000e-004**	**80.9058**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3446	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.3900e-003	1.3900e-003	0.0000	0.0000	1.4700e-003
Unmitigated	0.3446	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.3900e-003	1.3900e-003	0.0000	0.0000	1.4700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0406					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.0000e-005	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.3900e-003	1.3900e-003	0.0000	0.0000	1.4700e-003
Total	**0.3446**	**1.0000e-005**	**7.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.3900e-003**	**1.3900e-003**	**0.0000**	**0.0000**	**1.4700e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0406					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	7.0000e-005	1.0000e-005	7.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.3900e-003	1.3900e-003	0.0000	0.0000	1.4700e-003
Total	**0.3446**	**1.0000e-005**	**7.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.3900e-003**	**1.3900e-003**	**0.0000**	**0.0000**	**1.4700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	14.6523	0.2529	6.0700e-003	21.8441
Unmitigated	14.6523	0.2530	6.0700e-003	21.8480

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	7.74688 / 0	14.6523	0.2530	6.0700e-003	21.8480
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**14.6523**	**0.2530**	**6.0700e-003**	**21.8480**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	7.74688 / 0	14.6523	0.2529	6.0700e-003	21.8441
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**14.6523**	**0.2529**	**6.0700e-003**	**21.8441**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	8.4322	0.4983	0.0000	18.8972
Unmitigated	8.4322	0.4983	0.0000	18.8972

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	41.54	8.4322	0.4983	0.0000	18.8972
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**8.4322**	**0.4983**	**0.0000**	**18.8972**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	41.54	8.4322	0.4983	0.0000	18.8972
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**8.4322**	**0.4983**	**0.0000**	**18.8972**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Gallinas Phase 3

Marin County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	33.50	1000sqft	0.77	33,500.00	0
Other Non-Asphalt Surfaces	44.33	1000sqft	1.02	44,333.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 69

Climate Zone 5 **Operational Year** 2020

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - 2019 calendar

Demolition -

Construction Off-road Equipment Mitigation -

Grading - rev 1

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	19.00
tblConstructionPhase	PhaseEndDate	1/25/2019	1/27/2019
tblConstructionPhase	PhaseEndDate	2/4/2019	2/6/2019
tblConstructionPhase	PhaseStartDate	1/30/2019	2/1/2019
tblGrading	AcresOfGrading	1.50	1.79
tblGrading	AcresOfGrading	1.00	1.79
tblLandUse	LandUseSquareFeet	44,330.00	44,333.00
tblProjectCharacteristics	OperationalYear	2014	2020

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.5127	22.2859	20.4087	0.0286	6.2939	1.2155	7.3191	3.0189	1.1366	3.9621	0.0000	2,681.4711	2,681.4711	0.6189	0.0000	2,694.4676
Total	**2.5127**	**22.2859**	**20.4087**	**0.0286**	**6.2939**	**1.2155**	**7.3191**	**3.0189**	**1.1366**	**3.9621**	**0.0000**	**2,681.4711**	**2,681.4711**	**0.6189**	**0.0000**	**2,694.4676**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.5127	22.2859	20.4087	0.0286	2.5007	1.2155	3.5258	1.1896	1.1366	2.1327	0.0000	2,681.4711	2,681.4711	0.6189	0.0000	2,694.4676
Total	**2.5127**	**22.2859**	**20.4087**	**0.0286**	**2.5007**	**1.2155**	**3.5258**	**1.1896**	**1.1366**	**2.1327**	**0.0000**	**2,681.4711**	**2,681.4711**	**0.6189**	**0.0000**	**2,694.4676**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**60.27**	**0.00**	**51.83**	**60.60**	**0.00**	**46.17**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.8888	7.0000e-005	8.0000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0170	0.0170	5.0000e-005		0.0180
Energy	0.0254	0.2311	0.1941	1.3900e-003		0.0176	0.0176		0.0176	0.0176		277.2861	277.2861	5.3100e-003	5.0800e-003	278.9736
Mobile	0.7508	1.6672	7.5188	0.0195	1.4599	0.0246	1.4845	0.3928	0.0227	0.4154		1,494.3514	1,494.3514	0.0541		1,495.4877
Total	**2.6650**	**1.8984**	**7.7209**	**0.0209**	**1.4599**	**0.0422**	**1.5021**	**0.3928**	**0.0403**	**0.4330**		**1,771.6545**	**1,771.6545**	**0.0595**	**5.0800e-003**	**1,774.4792**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.8888	7.0000e-005	8.0000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0170	0.0170	5.0000e-005		0.0180
Energy	0.0254	0.2311	0.1941	1.3900e-003		0.0176	0.0176		0.0176	0.0176		277.2861	277.2861	5.3100e-003	5.0800e-003	278.9736
Mobile	0.7508	1.6672	7.5188	0.0195	1.4599	0.0246	1.4845	0.3928	0.0227	0.4154		1,494.3514	1,494.3514	0.0541		1,495.4877
Total	**2.6650**	**1.8984**	**7.7209**	**0.0209**	**1.4599**	**0.0422**	**1.5021**	**0.3928**	**0.0403**	**0.4330**		**1,771.6545**	**1,771.6545**	**0.0595**	**5.0800e-003**	**1,774.4792**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/27/2019	5	19	
2	Site Preparation	Site Preparation	1/28/2019	1/29/2019	5	2	
3	Grading	Grading	2/1/2019	2/6/2019	5	4	
4	Building Construction	Building Construction	2/7/2019	11/13/2019	5	200	

Acres of Grading (Site Preparation Phase): 1.79

Acres of Grading (Grading Phase): 1.79

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	48.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	33.00	13.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5440	0.0000	0.5440	0.0824	0.0000	0.0824			0.0000			0.0000
Off-Road	2.1896	21.6524	19.1429	0.0245		1.2063	1.2063		1.1282	1.1282		2,397.476 6	2,397.476 6	0.6127		2,410.344 1
Total	**2.1896**	**21.6524**	**19.1429**	**0.0245**	**0.5440**	**1.2063**	**1.7503**	**0.0824**	**1.1282**	**1.2105**		**2,397.476 6**	**2,397.476 6**	**0.6127**		**2,410.344 1**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0575	0.5783	0.7911	1.8600e-003	0.0439	8.2700e-003	0.0521	0.0120	7.6100e-003	0.0196		178.0177	178.0177	1.3500e-003		178.0460
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0388	0.0552	0.4746	1.4100e-003	0.1226	8.8000e-004	0.1235	0.0325	8.1000e-004	0.0333		105.9768	105.9768	4.8000e-003		106.0776
Total	**0.0962**	**0.6335**	**1.2658**	**3.2700e-003**	**0.1665**	**9.1500e-003**	**0.1756**	**0.0445**	**8.4200e-003**	**0.0529**		**283.9945**	**283.9945**	**6.1500e-003**		**284.1236**

3.2 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2122	0.0000	0.2122	0.0321	0.0000	0.0321			0.0000			0.0000
Off-Road	2.1896	21.6524	19.1429	0.0245		1.2063	1.2063		1.1282	1.1282	0.0000	2,397.476 6	2,397.476 6	0.6127		2,410.344 1
Total	**2.1896**	**21.6524**	**19.1429**	**0.0245**	**0.2122**	**1.2063**	**1.4185**	**0.0321**	**1.1282**	**1.1603**	**0.0000**	**2,397.476 6**	**2,397.476 6**	**0.6127**		**2,410.344 1**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0575	0.5783	0.7911	1.8600e-003	0.0439	8.2700e-003	0.0521	0.0120	7.6100e-003	0.0196		178.0177	178.0177	1.3500e-003		178.0460
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0388	0.0552	0.4746	1.4100e-003	0.1226	8.8000e-004	0.1235	0.0325	8.1000e-004	0.0333		105.9768	105.9768	4.8000e-003		106.0776
Total	**0.0962**	**0.6335**	**1.2658**	**3.2700e-003**	**0.1665**	**9.1500e-003**	**0.1756**	**0.0445**	**8.4200e-003**	**0.0529**		**283.9945**	**283.9945**	**6.1500e-003**		**284.1236**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2185	0.0000	6.2185	2.9989	0.0000	2.9989			0.0000			0.0000
Off-Road	1.8994	19.5740	14.3687	0.0171		1.0246	1.0246		0.9426	0.9426		1,694.7774	1,694.7774	0.5362		1,706.0378
Total	**1.8994**	**19.5740**	**14.3687**	**0.0171**	**6.2185**	**1.0246**	**7.2431**	**2.9989**	**0.9426**	**3.9416**		**1,694.7774**	**1,694.7774**	**0.5362**		**1,706.0378**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0239	0.0340	0.2921	8.7000e-004	0.0754	5.4000e-004	0.0760	0.0200	5.0000e-004	0.0205		65.2165	65.2165	2.9500e-003		65.2785
Total	**0.0239**	**0.0340**	**0.2921**	**8.7000e-004**	**0.0754**	**5.4000e-004**	**0.0760**	**0.0200**	**5.0000e-004**	**0.0205**		**65.2165**	**65.2165**	**2.9500e-003**		**65.2785**

3.3 Site Preparation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4252	0.0000	2.4252	1.1696	0.0000	1.1696			0.0000			0.0000
Off-Road	1.8994	19.5740	14.3687	0.0171		1.0246	1.0246		0.9426	0.9426	0.0000	1,694.777 4	1,694.777 4	0.5362		1,706.037 8
Total	**1.8994**	**19.5740**	**14.3687**	**0.0171**	**2.4252**	**1.0246**	**3.4498**	**1.1696**	**0.9426**	**2.1122**	**0.0000**	**1,694.777 4**	**1,694.777 4**	**0.5362**		**1,706.037 8**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0239	0.0340	0.2921	8.7000e-004	0.0754	5.4000e-004	0.0760	0.0200	5.0000e-004	0.0205		65.2165	65.2165	2.9500e-003		65.2785
Total	**0.0239**	**0.0340**	**0.2921**	**8.7000e-004**	**0.0754**	**5.4000e-004**	**0.0760**	**0.0200**	**5.0000e-004**	**0.0205**		**65.2165**	**65.2165**	**2.9500e-003**		**65.2785**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9911	0.0000	4.9911	2.5339	0.0000	2.5339			0.0000			0.0000
Off-Road	1.5501	16.0088	11.8643	0.0141		0.8357	0.8357		0.7688	0.7688		1,392.2307	1,392.2307	0.4405		1,401.4809
Total	**1.5501**	**16.0088**	**11.8643**	**0.0141**	**4.9911**	**0.8357**	**5.8268**	**2.5339**	**0.7688**	**3.3027**		**1,392.2307**	**1,392.2307**	**0.4405**		**1,401.4809**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0239	0.0340	0.2921	8.7000e-004	0.0754	5.4000e-004	0.0760	0.0200	5.0000e-004	0.0205		65.2165	65.2165	2.9500e-003		65.2785
Total	**0.0239**	**0.0340**	**0.2921**	**8.7000e-004**	**0.0754**	**5.4000e-004**	**0.0760**	**0.0200**	**5.0000e-004**	**0.0205**		**65.2165**	**65.2165**	**2.9500e-003**		**65.2785**

3.4 Grading - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.9465	0.0000	1.9465	0.9882	0.0000	0.9882			0.0000			0.0000
Off-Road	1.5501	16.0088	11.8643	0.0141		0.8357	0.8357		0.7688	0.7688	0.0000	1,392.2307	1,392.2307	0.4405		1,401.4809
Total	**1.5501**	**16.0088**	**11.8643**	**0.0141**	**1.9465**	**0.8357**	**2.7822**	**0.9882**	**0.7688**	**1.7570**	**0.0000**	**1,392.2307**	**1,392.2307**	**0.4405**		**1,401.4809**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0239	0.0340	0.2921	8.7000e-004	0.0754	5.4000e-004	0.0760	0.0200	5.0000e-004	0.0205		65.2165	65.2165	2.9500e-003		65.2785
Total	**0.0239**	**0.0340**	**0.2921**	**8.7000e-004**	**0.0754**	**5.4000e-004**	**0.0760**	**0.0200**	**5.0000e-004**	**0.0205**		**65.2165**	**65.2165**	**2.9500e-003**		**65.2785**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2639	15.8827	13.4498	0.0220		0.9117	0.9117		0.8808	0.8808		2,008.7495	2,008.7495	0.3850		2,016.8347
Total	**2.2639**	**15.8827**	**13.4498**	**0.0220**		**0.9117**	**0.9117**		**0.8808**	**0.8808**		**2,008.7495**	**2,008.7495**	**0.3850**		**2,016.8347**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1503	0.9661	2.1503	3.0200e-003	0.0857	0.0140	0.0997	0.0244	0.0129	0.0373		287.3993	287.3993	2.2300e-003		287.4462
Worker	0.0985	0.1402	1.2048	3.5800e-003	0.3112	2.2300e-003	0.3134	0.0825	2.0700e-003	0.0846		269.0180	269.0180	0.0122		269.2740
Total	**0.2488**	**1.1063**	**3.3551**	**6.6000e-003**	**0.3969**	**0.0162**	**0.4132**	**0.1069**	**0.0149**	**0.1219**		**556.4173**	**556.4173**	**0.0144**		**556.7201**

3.5 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2639	15.8827	13.4498	0.0220		0.9117	0.9117		0.8808	0.8808	0.0000	2,008.749 5	2,008.749 5	0.3850		2,016.834 7
Total	**2.2639**	**15.8827**	**13.4498**	**0.0220**		**0.9117**	**0.9117**		**0.8808**	**0.8808**	**0.0000**	**2,008.749 5**	**2,008.749 5**	**0.3850**		**2,016.834 7**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1503	0.9661	2.1503	3.0200e-003	0.0857	0.0140	0.0997	0.0244	0.0129	0.0373		287.3993	287.3993	2.2300e-003		287.4462
Worker	0.0985	0.1402	1.2048	3.5800e-003	0.3112	2.2300e-003	0.3134	0.0825	2.0700e-003	0.0846		269.0180	269.0180	0.0122		269.2740
Total	**0.2488**	**1.1063**	**3.3551**	**6.6000e-003**	**0.3969**	**0.0162**	**0.4132**	**0.1069**	**0.0149**	**0.1219**		**556.4173**	**556.4173**	**0.0144**		**556.7201**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.7508	1.6672	7.5188	0.0195	1.4599	0.0246	1.4845	0.3928	0.0227	0.4154		1,494.3514	1,494.3514	0.0541		1,495.4877
Unmitigated	0.7508	1.6672	7.5188	0.0195	1.4599	0.0246	1.4845	0.3928	0.0227	0.4154		1,494.3514	1,494.3514	0.0541		1,495.4877

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	233.50	44.22	22.78	514,866	514,866
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	233.50	44.22	22.78	514,866	514,866

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546553	0.066568	0.183016	0.119431	0.033835	0.004061	0.013378	0.012756	0.001897	0.008192	0.008006	0.000710	0.001596

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0254	0.2311	0.1941	1.3900e-003		0.0176	0.0176		0.0176	0.0176		277.2861	277.2861	5.3100e-003	5.0800e-003	278.9736
NaturalGas Unmitigated	0.0254	0.2311	0.1941	1.3900e-003		0.0176	0.0176		0.0176	0.0176		277.2861	277.2861	5.3100e-003	5.0800e-003	278.9736

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	2356.93	0.0254	0.2311	0.1941	1.3900e-003		0.0176	0.0176		0.0176	0.0176		277.2861	277.2861	5.3100e-003	5.0800e-003	278.9736
Total		**0.0254**	**0.2311**	**0.1941**	**1.3900e-003**		**0.0176**	**0.0176**		**0.0176**	**0.0176**		**277.2861**	**277.2861**	**5.3100e-003**	**5.0800e-003**	**278.9736**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	2.35693	0.0254	0.2311	0.1941	1.3900e-003		0.0176	0.0176		0.0176	0.0176		277.2861	277.2861	5.3100e-003	5.0800e-003	278.9736
Total		**0.0254**	**0.2311**	**0.1941**	**1.3900e-003**		**0.0176**	**0.0176**		**0.0176**	**0.0176**		**277.2861**	**277.2861**	**5.3100e-003**	**5.0800e-003**	**278.9736**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.8888	7.0000e-005	8.0000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0170	0.0170	5.0000e-005		0.0180
Unmitigated	1.8888	7.0000e-005	8.0000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0170	0.0170	5.0000e-005		0.0180

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2224					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.6656					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.5000e-004	7.0000e-005	8.0000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0170	0.0170	5.0000e-005		0.0180
Total	**1.8888**	**7.0000e-005**	**8.0000e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**		**0.0170**	**0.0170**	**5.0000e-005**		**0.0180**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2224					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.6656					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	7.5000e-004	7.0000e-005	8.0000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005		0.0170	0.0170	5.0000e-005		0.0180
Total	**1.8888**	**7.0000e-005**	**8.0000e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**		**0.0170**	**0.0170**	**5.0000e-005**		**0.0180**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

AERSCREEN 15181 / AERMOD 15181 02/23/16
14:54:48

TITLE: Las Gallinas

**************************** VOLUME PARAMETERS ****************************

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 5.00 meters 16.40 feet
INITIAL LATERAL DIMENSION: 33.09 meters 108.56 feet
INITIAL VERTICAL DIMENSION: 2.33 meters 7.64 feet
RURAL OR URBAN: URBAN
POPULATION: 59000

INITIAL PROBE DISTANCE = 1000. meters 3281. feet

********************** BUILDING DOWNWASH PARAMETERS **********************

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

************************* PROBE ANALYSIS *************************
25 meter receptor spacing: 72. meters - 1000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	0.420	554.1	72.1	ANN

* = worst case flow sector

********************* MAKEMET METEOROLOGY PARAMETERS *********************

MIN/MAX TEMPERATURE: 278.0 / 300.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: USER ENTERED

ALBEDO: 0.16
BOWEN RATIO: 0.86
ROUGHNESS LENGTH: 0.420 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

```
 YR MO DY JDY HR
 -- -- -- --- --
 10 03 27  27 01

   H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
-12.64  0.126 -9.000  0.020 -999.  103.     14.6 0.420   0.86   0.16    2.00

   HT  REF TA     HT
- - - - - - - - - - -
  10.0   300.0    2.0
```

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

```
 YR MO DY JDY HR
 -- -- -- --- --
 10 03 27  27 01

   H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
-12.64  0.126 -9.000  0.020 -999.  103.     14.6 0.420   0.86   0.16    2.00

   HT  REF TA     HT
- - - - - - - - - - -
  10.0   300.0    2.0
```

************************ AERSCREEN AUTOMATED DISTANCES **********************
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
72.14	554.1	550.00	48.30
75.00	534.5	575.00	45.47
100.00	402.0	600.00	42.91
125.00	315.8	625.00	40.59
150.00	256.4	650.00	38.47
175.00	213.5	675.00	36.53

200.00	181.4	700.00	34.76
225.00	156.6	725.00	33.13
250.00	137.1	750.00	31.62
275.00	121.3	775.00	30.23
300.00	108.4	800.00	28.93
325.00	97.59	825.00	27.73
350.00	88.53	850.00	26.62
375.00	80.80	875.00	25.57
400.00	74.15	900.00	24.60
425.00	68.38	925.00	23.68
450.00	63.34	950.00	22.83
475.00	58.89	975.00	22.02
500.00	54.96	1000.00	21.26
525.00	51.45		

********************** AERSCREEN MAXIMUM IMPACT SUMMARY *********************

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	554.1	554.1	498.7	332.5	55.41

DISTANCE FROM SOURCE 72.14 meters

IMPACT AT THE AMBIENT BOUNDARY	554.1	554.1	498.7	332.5	55.41

DISTANCE FROM SOURCE 72.14 meters

Start date and time 02/23/16 14:51:27
AERSCREEN 15181

Las Gallinas

Las Gallinas

----------------- DATA ENTRY VALIDATION -----------------

	METRIC	ENGLISH
** VOLUMEDATA **	---------------	----------------
Emission Rate:	1.0000 g/s	7.937 lb/hr
Volume Height:	5.00 meters	16.40 feet
Lateral Dimension:	33.09 meters	108.56 feet
Vertical Dimension:	2.33 meters	7.64 feet
Model Mode:	URBAN	
Population:	59000	
Dist to Ambient Air:	72.1 meters	237. feet

** BUILDING DATA **

No Building Downwash Parameters

** TERRAIN DATA **

No Terrain Elevations
Source Base Elevation: 3.0 meters 10.0 feet

Probe distance: 1000. meters 3281. feet

No flagpole receptors

No discrete receptors used

** FUMIGATION DATA **

No fumigation requested

** METEOROLOGY DATA **

Min/Max Temperature: 278.0 / 300.0 K 40.7 / 80.3 Deg F

Minimum Wind Speed: 0.5 m/s

Anemometer Height: 10.000 meters

Albedo: 0.16

Bowen Ratio: 0.86
Roughness Length: 0.420 (meters)

DEBUG OPTION OFF

AERSCREEN output file:
Gallinas.out

*** AERSCREEN Run is Ready to Begin

No terrain used, AERMAP will not be run
****

SURFACE CHARACTERISTICS & MAKEMET
Obtaining surface characteristics...

Using user defined surface characteristics

Annual	Albedo	Bo	zo
	0.16	0.86	0.420

Creating met files aerscreen_01_01.sfc & aerscreen_01_01.pfl

PROBE started 02/23/16 14:54:47

Running probe for Annual sector 1

AERMOD Finishes Successfully for PROBE stage 1 Annual sector 1

******** WARNING MESSAGES ********
*** NONE ***

PROBE ended 02/23/16 14:54:48

REFINE started 02/23/16 14:54:48

AERMOD Finishes Successfully for REFINE stage 3 Annual sector 1

******** WARNING MESSAGES ********
*** NONE ***

REFINE ended 02/23/16 14:54:48

****
AERSCREEN Finished Successfully
With no errors or warnings
Check log file for details
****

Ending date and time 02/23/16 14:54:48

** VOLUME DATA Rate Height Syinit Szinit

** 0.1000E+01 5.0000 33.0900 2.3300

** BUILDING DATA BPIP Height Max dim. Min dim. Orient. Direct. Offset

** N 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

** MAKEMET DATA MinT MaxT Speed AnemHt Surf Clim Albedo Bowen Length SC FILE

** 278.00 300.00 0.5 10.000 0 0 0.1600 0.8600 0.4200 "NA"

** TERRAIN DATA Terrain UTM East UTM North Zone Nada Probe PROFBASE Use AERMAP elev

** N 0.0 0.0 0 0 1000.0 3.05 N

** DISCRETE RECEPTORS Discflag Receptor file

** N "NA"

** UNITS/POPULATION Units R/U Population Amb. dist. Flagpole Flagpole height

** M U 59000. 72.144 N 0.00

** FUMIGATION Inversion Break-up Shoreline Distance Direct Run AERSCREEN

** N N 0.00 -9.0 Y

** DEBUG OPTION Debug

** N

** OUTPUT FILE "Gallinas.out"

** Temporal sector: Annual, spatial sector: 1

```
CO STARTING
   TITLEONE Las Gallinas
**             REFINE STAGE 3
   MODELOPT CONC SCREEN  FLAT
   AVERTIME 1
   URBANOPT    59000.
   POLLUTID OTHER
   RUNORNOT RUN
CO FINISHED

SO STARTING
   LOCATION SOURCE VOLUME       0.0     0.0
   SRCPARAM SOURCE   0.1000E+01    5.000   33.090    2.330

   URBANSRC  SOURCE

   SRCGROUP  ALL

SO FINISHED

RE STARTING
** Fence line receptor
   DISCCART         72.14          0.00
** Refined receptors
   DISCCART         73.00          0.00
   DISCCART         74.00          0.00
```

DISCCART	75.00	0.00
DISCCART	76.00	0.00
DISCCART	77.00	0.00
DISCCART	78.00	0.00
DISCCART	79.00	0.00
DISCCART	80.00	0.00
DISCCART	81.00	0.00
DISCCART	82.00	0.00
DISCCART	83.00	0.00
DISCCART	84.00	0.00
DISCCART	85.00	0.00
DISCCART	86.00	0.00
DISCCART	87.00	0.00
DISCCART	88.00	0.00
DISCCART	89.00	0.00
DISCCART	90.00	0.00
DISCCART	91.00	0.00
DISCCART	92.00	0.00
DISCCART	93.00	0.00
DISCCART	94.00	0.00
DISCCART	95.00	0.00
DISCCART	96.00	0.00
DISCCART	97.00	0.00
DISCCART	98.00	0.00
DISCCART	99.00	0.00
DISCCART	100.00	0.00
DISCCART	101.00	0.00

DISCCART 102.00 0.00

DISCCART 103.00 0.00

DISCCART 104.00 0.00

DISCCART 105.00 0.00

DISCCART 106.00 0.00

DISCCART 107.00 0.00

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DISCCART 109.00 0.00

DISCCART 110.00 0.00

DISCCART 111.00 0.00

DISCCART 112.00 0.00

DISCCART 113.00 0.00

DISCCART 114.00 0.00

DISCCART 115.00 0.00

DISCCART 116.00 0.00

DISCCART 117.00 0.00

DISCCART 118.00 0.00

DISCCART 119.00 0.00

DISCCART 120.00 0.00

DISCCART 121.00 0.00

DISCCART 122.00 0.00

RE FINISHED

ME STARTING

SURFFILE aerscreen_01_01.sfc FREE

PROFFILE aerscreen_01_01.pfl FREE

```
   SURFDATA  11111   2010  SCREEN
   UAIRDATA  22222   2010  SCREEN
   PROFBASE    3.0 METERS
ME FINISHED

OU STARTING
   RECTABLE 1  FIRST
   MAXTABLE  ALLAVE  50

   FILEFORM  EXP
   RANKFILE  1 10 AERSCREEN.FIL
   PLOTFILE  1 ALL  FIRST  AERSCREEN.PLT
OU FINISHED
```

```
 Concentration     Distance Elevation  Season/Month   Zo sector       Date      H0     U*      W*  DT/DZ ZICNV ZIMCH
M-O LEN    Z0  BOWEN ALBEDO  REF WS     HT  REF TA      HT
*  0.55411E+03        72.14       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.53454E+03       75.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.40202E+03      100.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.31581E+03      125.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.25639E+03      150.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.21350E+03      175.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.18138E+03      200.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.15662E+03      225.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.13706E+03      250.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.12129E+03      275.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.10835E+03      300.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.97594E+02      325.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.88527E+02      350.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.80801E+02      375.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.74154E+02      400.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.68384E+02      425.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.63338E+02      450.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.58894E+02      475.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.54956E+02      500.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.51446E+02      525.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.48301E+02      550.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.45470E+02      575.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.42910E+02      600.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.40586E+02      625.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.38470E+02      650.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
0.420   0.86   0.16    2.00  10.0  300.0    2.0
   0.36534E+02      675.00       0.00         Annual       0-360   10032701  -12.64  0.126 -9.000  0.020 -999.  103.     14.6
```

0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.34759E+02 700.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.33126E+02 725.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.31620E+02 750.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.30226E+02 775.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.28935E+02 800.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.27735E+02 825.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.26617E+02 850.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.25574E+02 875.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.24598E+02 900.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.23685E+02 925.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.22828E+02 950.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.22022E+02 975.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0
0.21264E+02 1000.00 0.00 Annual 0-360 10032701 -12.64 0.126 -9.000 0.020 -999. 103. 14.6
0.420 0.86 0.16 2.00 10.0 300.0 2.0

HARP2 - HRACalc (dated 16057) 3/10/2016 3:32:32 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 3

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 1
2<16 Years Bin: 0
16<30 Years Bin: 0
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: LongTerm24HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: ON

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS

Tier2 adjustments were used in this assessment. Please see the input file for details.
Calculating cancer risk
Cancer risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_resident_CancerRisk.csv
Calculating chronic risk
Chronic risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_resident_NCChronicRisk.csv
Calculating acute risk
Acute risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_resident_NCAcuteRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16057) 3/10/2016 3:33:34 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: 16
Total Exposure Duration: 3

Exposure Duration Bin Distribution
3rd Trimester Bin: 0
0<2 Years Bin: 0
2<9 Years Bin: 0
2<16 Years Bin: 0
16<30 Years Bin: 3
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS

Tier2 adjustments were used in this assessment. Please see the input file for details.
Calculating cancer risk
Cancer risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_worker_CancerRisk.csv
Calculating chronic risk
Chronic risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_worker_NCChronicRisk.csv
Calculating acute risk
Acute risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_worker_NCAcuteRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16057) 2/26/2016 8:43:49 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 30

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 14
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: LongTerm24HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: ON

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_operation_resident_CancerRisk.csv
Calculating chronic risk
Chronic risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_operation_resident_NCChronicRisk.csv
Calculating acute risk
Acute risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_operation_resident_NCAcuteRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16057) 2/26/2016 8:45:38 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: 16
Total Exposure Duration: 25

Exposure Duration Bin Distribution
3rd Trimester Bin: 0
0<2 Years Bin: 0
2<9 Years Bin: 0
2<16 Years Bin: 0
16<30 Years Bin: 0
16 to 70 Years Bin: 25

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_operation_worker_CancerRisk.csv
Calculating chronic risk
Chronic risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_operation_worker_NCChronicRisk.csv
Calculating acute risk
Acute risk saved to: C:\Users\bboyes\Desktop\RAST Outputs\Gallinas_operation_worker_NCAcuteRisk.csv
HRA ran successfully

APPENDIX B: BIOLOGICAL RESOURCES ASSESSMENT

DUDEK

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March 14, 2016 9279

Ms. Stephanie Standerfer
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

Subject: Biological Resources Assessment for the Proposed Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project, San Rafael, Marin County, California

Dear Ms. Standerfer:

This letter describes the results of a biological resource assessment conducted for the proposed Las Gallinas Valley Sanitary District (LGVSD) project in San Rafael, California. Specifically, this report describes the project study area, identifies existing biological resources, evaluates the potential for special-status biological resources to occur within the study area, provides a preliminary assessment of expected regulatory requirements related to biological resource impacts of the project, and describes any potential biological resource constraints to project implementation.

1.0 SITE LOCATION AND DESCRIPTION

The approximately 12.65-acre project study area (study area) is located in San Rafael, California at 300 Smith Ranch Road (Figure 1). The proposed project is located approximately one mile east of U.S. Highway 101 and one mile west of the western shoreline of San Pablo Bay. The project is located in Section 10 of Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5’ quadrangle. The approximate center of the study area corresponds to 38°01’30.54” north latitude and 122°31’06.82” west longitude (Figure 2).

The study area is generally characterized as developed/disturbed. The majority of the study area is developed with buildings, ornamental landscaping, paved roads and parking areas, gravel lots, and infrastructure associated with the wastewater treatment facility. Most of the study area is flat and generally slopes toward the southeast with elevations varying from approximately 10 feet above mean sea level (AMSL) in the southern portion of the site to about 110 feet AMSL in the western portion of the site. Surrounding land uses include a golf course to the south, nature trails surrounding a wetland complex to the northeast and east, reclaimed diked bay lands to the north and southeast and commercial development to the west, which is surrounded by open space (Figure 3).

Four soil types are mapped within the study area and includes Blucher-Cole complex, 2-5% slopes, Reyes clay, Saurin-Bonnydoon complex, 15-30% slopes, and Xerorthents. Blucher-Cole complex is a somewhat poorly drained, slightly saline soil that occurs on basin floors and alluvial fans and is derived from sandstone, granite or shale (USDA 2016). Reyes clay is a somewhat poorly drained, highly saline soil that is derived from igneous, metamorphic and sedimentary rock. Saurin-Bonnydoon complex is a somewhat excessively drained soil that is residuum weathered from sandstone and shale that consists of gravelly loam and weathered bedrock. Xerorthents are deposits derived from igneous, metamorphic and sedimentary rock and occur on tidal flats and valley floors.

2.0 PROJECT DESCRIPTION

The current WWTP facility is an active wastewater treatment plant that serves approximately 30,000 customers in northern San Rafael. The District currently provides secondary treatment of wastewater from mainly commercial and domestic sources within its service area. Effluent is ultimately discharged into Miller Creek, a tributary of San Pablo Bay. During the dry season, effluent is diverted to the District's onsite reclamation facilities which include a marsh pond, irrigated pasture, two storage ponds, and public trails.

The proposed project will provide an expansion of the plant's ability to handle peak wet weather daily flows of 18 MGD, doubling the plant's wet weather treatment capacity. In order to add the additional capacity for wet weather treatment, the following key improvements will be implemented within the existing treatment plant footprint: (1) installation of a combined fixed-film, activated sludge process; (2) construction of a 1.2 million gallon equalization basin; (3) addition of a new primary pump station to regulate the flowrate of primary effluent into the secondary treatment portion of the plant; (4) installation of two additional secondary clarifiers; (5) modifications to the existing chlorine contact basin to create sufficient head availability during storm events; (6) expansion of the recycled water facility to treat its designed capacity of 5.4 MGD; and (7) removal of existing Marin Municipal Water District (MMWD) recycled water facility to accommodate the secondary treatment upgrade.

The project will also involve modifications to the existing facility access road and the replacement of an existing force main sewer line serving the treatment plant. These two project components will involve construction activities outside of the existing facility footprint as described below.

Approximately 2,600 feet of new piping will be installed as a part of the replacement of the existing force main along Smith Ranch Road. The new force main will replace an existing force main in the same alignment as the existing line. This work specifically includes replacement of 1800 linear feet of an 18-inch line with a new 24-inch line and replacement of an additional 800 feet of an existing 28-inch line with a new 28-inch line.

The existing access road that extends through the central portion of the facility will be relocated to the eastern periphery of the project site. The proposed alignment will involve the construction of a new paved access roadway and will improve the overall plant layout and move existing public access to outside the plant fence line. In addition, as part of the road relocation, the road will be constructed to address future sea level rise issues along with storm events. The existing laboratory building will be relocated from its current location and up to three utility poles and overhead power lines along the road will be relocated to allow for the access road realignment. As part of this work, the existing backwash/balancing basins associated with the MMWD recycled water facility will be removed to accommodate the installation of the secondary clarifiers and adjacent roadway realignment. This area will be graded and raised as required.

The project will be implemented in three phases to allow for the construction of the new processes while maintaining treatment capabilities with existing treatment processes. By splitting construction into three phases, treatment capabilities are maintained while the new processes are constructed and implemented. The phases will be constructed in series with the total project requiring between 24-30 months for completion.

3.0 SITE RESOURCE EVALUATIONS

Dudek biologists conducted an analysis of biological resources present within and adjacent to the study area by reviewing pertinent literature and evaluating field conditions during the reconnaissance survey. The following section summarizes methods used to identify and evaluate sensitive biological resources that have potential to occur within the study area.

3.1 Special-Status Species and Sensitive Resources

Special-status biological resources present or potentially present within the study area were identified through a literature search using the following sources: U.S. Fish and Wildlife Service (USFWS) Information, Planning and Conservation (IPaC) Trust Resources Report; California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB); and the California Native Plant Society (CNPS) online Inventory of Rare and Endangered Vascular Plants. Historical aerial photography (Google Earth 2016) was used to determine areas of the site that could potentially contain jurisdictional Waters of the U.S. or Waters of the State.

A CNDDB records search was conducted for the Novato USGS 7.5-minute quadrangle and the surrounding eight quadrangles (CNDDB 2003, December 2015 update). Dudek also conducted a CNPS search for the Novato USGS 7.5-minute quadrangle and the surrounding eight quadrangles (CNPS, December 2015 update). In addition to state and federally-listed species, California Rare Plant Rank (CRPR) 1 and 2 plant species were included in this search. The IPaC Trust Resources Report was generated from an approximately five-mile radius around the study area.

3.2 Vegetation Community and Land Cover Types

Vegetation communities and land cover types present within the 12.65-acre study area were evaluated and delineated on a map during the field reconnaissance surveys. An aerial photograph (Google Earth 2015) with an overlay of the study area boundary, and surrounding buffer was utilized to map the vegetation communities and record any special-status species observations or other sensitive biological resources while in the field (Figure 4).

3.3 Flora

All plant species encountered during the field reconnaissance surveys were identified and recorded directly into a field notebook. Common and scientific names for plant species with a CRPR follow the CNPS On-Line Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2015). A list of plant species observed in the study area is presented in Appendix B.

3.4 Fauna

Wildlife species detected during the field reconnaissance surveys by sight, calls, tracks, scat, or other sign were recorded directly into a field notebook. The study area was scanned with and without binoculars to aid in the identification of wildlife. In addition to species actually detected during the field surveys, expected wildlife use was determined by known habitat preferences of local species and knowledge of their relative distributions in the area.

3.5 Potentially Jurisdictional Wetlands and Waters

A formal delineation of waters of the United States/State was not conducted as part of this biological resources assessment. However, all aquatic features observed within the study area that supported hydrophytic vegetation and/or exhibited evidence of wetland hydrology and that could be subject to regulation by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and/or CDFW were investigated and their locations mapped on Figure 4.

4.0 RESULTS

The discussion of biological resources below pertains to habitats and species present within and adjacent to the study area. Representative site photographs are provided in Figure 5.

4.1 Field Assessment

Field reconnaissance surveys were conducted on December 9, 2015, by Dudek wildlife biologists Lisa Achter and Alejandro Goena, and senior aquatic ecologist Craig Seltenrich; and on March 3, 2016 by Lisa Achter. During these field reconnaissance surveys, all terrestrial and aquatic habitat areas within and adjacent to the study area were evaluated. The field reconnaissance surveys were conducted on foot to thoroughly cover the study area and adjacent environments.

4.2 Special-Status Species and Sensitive Resources

Following review of the CNDDB, CNPS, and IPaC searches, Dudek analyzed the potential for each species to occur within the study area based on a review of vegetation communities, land cover types, and habitat types observed during the field assessment, as well as soils information, species elevation preferences, and the known geographic range of each species (Appendix A). Species were eliminated from consideration when the study area was clearly outside the known geographic range of the species, or if the study area did not contain habitat characteristics required by the species. A brief evaluation of the potential for each species to occur within or adjacent to the study area is provided in Appendix A.

4.2.1 Special-Status Plants

Results of the CNDDB and CNPS searches revealed 15 special-status plant species that have potential to occur on or in the vicinity of the study area (Appendix A). Of these 15 species, 14 species were eliminated from consideration due to the lack of suitable habitat conditions or the study area is outside the species range. The remaining plant species, soft salty birds-beak (*Chloropyron molle ssp. molle*) is a semi-parasitic annual herb in the Orobanchaceae family. It occurs in coastal salt marshes and swamps between zero and 10 feet above mean sea-level and blooms from July to November. Although coastal salt marsh habitat does not occur within the study area, it occurs adjacent to the northern and eastern boundaries of the study area. Furthermore, due to the proximity of the treatment plant to San Francisco Bay and surrounding expanses of relatively undisturbed baylands, there is increased potential for special-status plants to occur in portions of the study area that have remained undeveloped (e.g., areas along the force main alignment). Therefore, in order to confirm presence/absence of special-status plants, focused surveys for soft salty bird's-beak and other rare plants should be conducted by a qualified botanist during the blooming period(s) of the target species.

4.2.2 Special-Status Wildlife

Results of the CNDDB and IPaC searches revealed 19 special-status animal species (species that are listed or proposed for listing as rare, threatened, or endangered by either the USFWS or CDFW; Appendix A). Of the 19 species, 16 species were removed from further consideration due to lack of suitable habitat conditions within the study area, or the study area is outside of the species range. These 16 species are: bank swallow (*Riparia riparia*), California least tern (*Sterna antillarum browni*), northern spotted owl (*Strix occidentalis caurina*), Swainson's hawk (*Buteo swainsoni*), western snowy plover (*Charadrius alexandrines nivosus*), yellow warbler (*Setophaga petechia*), California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostrus obsoletus*), tricolored blackbird (*Agelaius tricolor*), California red-legged frog (CRLF, *Rana draytonii*), California tiger salamander (*Ambystoma californiense*), salt marsh harvest mouse (*Reithrodontomys raviventris*), longfin smelt (*Spirinchus thaleichthys*), coho salmon (*Oncorhynchus kisutch*), steelhead (*Oncorhynchus mykiss irideus*) and California freshwater shrimp (*Syncaris pacifica*).

A habitat assessment for CRLF was performed independently of this general biological assessment. Results of the CRLF survey can be found in Appendix D.

The three remaining species have moderate potential to occur within the study area. These species include burrowing owl (*Athene cunicularia*), short eared owl (*Asio flammeus*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Suitable nesting and foraging habitat exists for both owl species on and adjacent to the study area. Townsend's big-eared bat could potentially utilize the equipment and treatment plant infrastructure/facilities for roosting and the study area for foraging (Appendix A).

All raptor species found in California are protected by California Fish and Game Code 3503.5. Four raptor species were observed on or flying over the study area during the survey and several suitable nesting trees and/or cavities are present within the study area. Although raptor species have the potential to nest and forage within the study area and surrounding area, the study area does not provide substantially important habitat, due to its small size and developed condition that would affect raptor species from continuing to occur in the area.

Because there is potential for several bat species (including Townsend's big-eared bat) to use the study area for roosting and foraging, Dudek recommends that a focused habitat assessment and pre-construction bat survey be conducted by a qualified biologist to assess potential presence of roosting bats in the buildings within the study area. If roosting bats are detected, consultation with CDFW is recommended to identify appropriate measures to be implemented to avoid and/or minimize impacts to bats. Such measures can include preparation of an exclusion plan that would require approval by CDFW and implementation before the initiation of construction activities.

4.2.3 Sensitive Resources and/or Habitats

Three potentially jurisdictional aquatic features and two constructed basins with wetland characteristics were identified within the study area. These features are described in more detail in Section 4.6 and their locations and extent of these resources are depicted on Figure 4. The proposed project is not located within or adjacent to any preserves or conservation areas.

4.3 Vegetation Communities and Land Cover Types

Six land cover types were documented within the study area (Figure 4). The majority of the study area consists of developed/disturbed habitat including buildings, paved areas and gravel lots, ornamental landscaping, and upland areas that contain a mixture of weedy ruderal plant species and non-native annual grasses. Annual grassland land cover type occurs in a small area between the eucalyptus (*Eucalyptus* spp.) grove to the west and Smith Ranch Road. The eucalyptus grove consists of approximately six eucalyptus trees that are interspersed among annual grassland habitat. A small area of oak woodland exists in the center of the study area on the knoll to the west of the wastewater treatment facility. This area consists of annual grassland habitat oak trees (*Quercus* spp.), cottonwood (*Populus* spp.) and eucalyptus. Oak woodland and annual grassland land cover types are described in more detail below.

Annual Grassland. The annual grassland vegetation community mapped during the survey is dominated by a dense to sparse cover of annual, non-native grasses and forbs. Common species include brome grass, Italian ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*), orchard grass (*Dactylis glomerata*), barley, filarees (*Erodium* spp.), and others. However, native species are also often present in this grassland community, including bulbs, legumes, and some grasses, such as blue wildrye (*Elymus glaucus*). Ruderal species also occur in grasslands, especially along the margins of grasslands and in areas that have been historically disturbed. All of the grass species are dormant during the dry summer months.

Oak Woodland. Oak Woodland occurs in a narrow band on the knoll to the west of the wastewater treatment facility. This stand of approximately a dozen trees consists primarily of coast live oak (*Quercus agrifolia*), cottonwood (*Populus* spp.) and eucalyptus. The understory consists primarily of non-native annual grassland species including wild oats, ripgut brome (*Bromus diandrus*), wild radish (*Raphanus sativus*), and wild mustard (*Brassica* spp.).

4.4 Flora

A total of 22 species of vascular plants were recorded during the field reconnaissance survey (see Appendix B). Of the 22 species, 12 are native to California. The remaining plants are non-native species which have become adapted to habitats in California.

4.5 Fauna

Twenty-two wildlife species were observed during the field survey. Avian species observed included American kestrel (*Falco sparverius*), mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), European starling (*Sturnus vulgaris*) American goldfinch (*Spinus tristis*), tundra swan (*Cygnus columbianus*), great egret (*Ardea alba*), black phoebe (*Sayornis nigricans*), California towhee (*Melozone crissalis*), house sparrow (*Passer domesticus*), turkey vulture (*Cathartes aura*), white-tailed kite (*Elanus leucurus*), American crow (*Corvus brachyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), red-tailed hawk (*Buteo jamacensis*), American coot (*Fulica americana*), common gallinule (*Gallinula galeata*), unoccupied cliff swallow (*Petrochelidon pyrrhonota*) nests and an unknown species of gull.

Other wildlife species encountered during the reconnaissance surveys included gopher snake (*Pituophis catenifer catenifer*), black-tailed jackrabbit (*Lepus californicus*), river otter (*Lontra canadensis*) scat, and mule deer (*Odocoileus hemionus*) tracks.

The study area is regularly disturbed by human activity and wastewater treatment facility operations. Several trails, to the north and east of the study area, are accessible to the public via a parking lot on the eastern edge of the study area.

4.5.1 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal.

Because the study area occurs within an area that has been subject to disturbance and modified by human activities, the study area has limited value as a potential wildlife corridor or habitat linkage. However, the surrounding lands could potentially be used as a local wildlife corridor by common wildlife species such as raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginianus*) and coyote (*Canis latrans*). Wintering waterfowl and other migratory birds were observed using the area to the north of the study area as a stopover for feeding and resting. All native migratory birds in California are protected by the federal Migratory Bird Treaty Act and this area could be utilized as a foraging and resting habitat linkage during migration periods.

4.6 Potentially Jurisdictional Wetlands and Waters

Several locations within the study area were identified as potentially jurisdictional wetlands. Three, small, potentially jurisdictional seasonal wetland features are located along Smith Ranch Road within the alignment of the proposed force main replacement. These features are present along the southern side of Smith Ranch Road and appear to hold runoff from the adjacent hillside and drain to the open fields on the northern side of the road via a culvert that passes under the road (Figure 4). These three features appear to be independent of each other and exhibit evidence of wetland hydrology.

In addition to the aquatic features located along the Smith Ranch Road, two constructed backwash/balancing basins are also present on the eastern side of the study area. These basins are dominated by freshwater emergent wetland vegetation, including cattail (*Typha* sp.); however, these are man-made features and function as part of the treatment plant's recycled water operation. The hydrology of these basins is artificial and is a function of the water that is piped into and out of these basins during the recycled water treatment process. Other inputs are limited to direct precipitation and a very limited amount of overland flow as the area surrounding these features has been highly modified.

5.0 POTENTIAL BIOLOGICAL RESOURCE CONSTRAINTS

This section addresses potential impacts to sensitive biological resources that could result from implementation of the proposed project.

5.1 Special-Status Species and Sensitive Resources

5.1.1 Special-Status Plants

Based on the field reconnaissance surveys of the study area, suitable habitat for special-status plant species does not appear to be present. The absence of appropriate habitat conditions and extent of prior development and ground disturbance likely precludes any special-status plant species from occurring within the study area. However, due to the proximity of the treatment plant to San Francisco Bay and surrounding expanses of relatively undisturbed baylands, there is increased potential for special-status plants to occur, especially in portions of the study area that have remained undeveloped (e.g., areas along the force main alignment). As such, a focused survey for special-status plants should be conducted during the appropriate blooming periods to ensure impacts to special-status plants do not result from project implementation.

5.1.2 Special-Status Wildlife

No special-status animals were detected during the field reconnaissance survey. However, all native birds in California are protected by the federal Migratory Bird Treaty Act (MBTA) of 1918 and Section 3503.5 of the California Fish and Game Code, which specifically protects raptors. The study area contains suitable nesting habitat for several common raptor species found in California, such as red-tailed hawk, and also common passerine species such as western meadowlark (*Sturnella neglecta*). Additionally, most of the construction activities within the study area would be within areas that have been previously developed and disturbed, and would therefore not cause additional loss of important habitat.

Dudek recommends a nesting bird survey be completed by a qualified biologist two weeks prior to construction during the nesting season (February 1 - September 30) to determine if any native birds are nesting on or near the site (including a 300 foot buffer for raptors). If any active nests are observed during surveys, a suitable avoidance buffer from the nests will be determined and flagged by the qualified biologist based on species, location and planned construction activity. These nests would be avoided until the chicks have fledged and the nests are no longer active. Dudek also recommends removing any habitat (i.e. trees) outside of the bird nesting season, and with proper permits for tree removal from the County.

A focused bat survey is recommended to determine if any suitable roosting habitat is present in the study area. The survey should take place not more than 30 days prior to the beginning of construction activities. Several species of bats are known to roost in the eaves of buildings, under peeling tree bark and tree cavities, and in other structures present on the study area. Bats are protected by California Fish and Game code and any maternity roosts should be avoided until natal young have left the roost. The breeding period for bats typically occurs between April and August in California. Young are born in the spring and typically leave the maternity roost in late summer or early fall. Any active maternity roosts, if present, should be avoided until the breeding season is over.

5.2 Vegetation Communities and Land Cover Types

Impacts from the proposed project would occur mostly to the developed portions of the study area, and therefore would not cause additional loss of important habitat to any listed species. Minimal temporary impacts to habitat along Smith Ranch Road would occur due to installation of the force main, but no permanent loss of important habitat for special-status species would occur due to development in this portion of the study area. To ensure impacts to vegetation communities within the study area are minimized, all previously undeveloped areas that are disturbed by construction activities should be returned to pre-project grades and contours to the maximum extent practicable. Any exposed soils should be stabilized, protected from erosion from wind and water and seeded with an appropriate native/naturalized seed mix.

5.3 Flora

As noted above, neither special-status plant species nor suitable habitat for these species was observed in the study area during the reconnaissance surveys; therefore, impacts to special-status plants are not expected to result from project implementation. As described in Section 5.1.1, a focused survey for special-status plants is recommended to confirm presence/absence of special-status plants and ensure impacts are avoided. A tree removal permit could be required from the County if any trees are to be removed as part of the project.

5.4 Fauna

Recommendations for potential impacts to common and special-status wildlife species is addressed in Section 5.1.2.

5.5 Jurisdictional Wetlands and Waters

The study area contains three small aquatic features which may be considered jurisdictional by the regulatory agencies (i.e., USACE, RWQCB and/or CDFW). A formal delineation of waters of the United States/State is recommended to determine if these features are jurisdictional wetlands and would be subject to regulation by one or more of these agencies. If these features are determined to be jurisdictional, and cannot be avoided by project construction activities, then a permit(s) from one or more of the regulatory agencies would be triggered and compensation for unavoidable impacts in the form of wetland creation, restoration and/or enhancement of aquatic resources similar to those impacted would likely be required. Such regulatory permits would likely include specific requirements to protect wildlife resources during project implementation, such as seasonal work restrictions, pre-construction surveys for nesting birds, erosion control measures and/or installation of wildlife exclusion fencing.

5.6. Local Ordinances and Regulations

5.6.1 Marin County Tree Preservation Ordinance

A Tree Removal Permit from the County of Marin is required for the removal of trees in the following instances:

• More than two (2) "Protected Trees" are being removed from a developed lot in a 12-month period;

• The tree qualifies as a "Heritage Tree";

• The tree is a "Protected Tree" or "Heritage Tree" and is located in a Stream Conservation Area or a Wetland Conservation Area;

• Any removal of "Protected Trees" on a vacant lot; and,

• The trees proposed for removal do not qualify for an exemption under Section 22.62.040 of the Marin County Code.

If any trees need to be removed to facilitate project implementation, a report from a licensed arborist should be obtained to verify the status of the trees and document the applicability of the criteria listed above.

6.0 RECOMMENDED MITIGATION MEASURES

Sensitive resources and habitats including potentially jurisdictional features are regulated by CDFW, USFWS and ACOE. Recommended mitigation measures include the following:

- A pre-construction nesting bird survey should be performed by a qualified biologist no earlier than two weeks prior to the initiation of construction activities. If any active nests are found, a suitable buffer will be determined by the biologist and the nest will be flagged and avoided until the eggs have hatched and the chicks have fledged.

- A pre-construction roosting bat survey is recommended to assess whether any active bat roosts are located within the study area. These surveys should be performed in the early spring when maternity colonies are being formed. If no maternity colonies exist in the study area, but day roosts are found, an exclusion plan should be developed in coordination with CDFW prior to initiation of construction.

- As described above, three potentially jurisdictional features and two constructed basins with wetland characteristics were observed in the study area during the field reconnaissance survey. A formal delineation of waters of the United States/State is recommended to determine the jurisdictional status of these features and whether project impacts to these features will trigger the need for permits from USACE, RWQCB and/or CDFW.

- To minimize impacts on vegetation communities from project construction activities, all previously undeveloped areas that are disturbed by construction activities should be returned to pre-project grades and contours to the maximum extent practicable. Any exposed soils should be stabilized, protected from wind and water erosion and seeded with an appropriate native/naturalized seed mix.

- Any trees that require removal should be assessed to determine if a permit from the County is required. If necessary, tree removal should occur outside of the bird nesting season (the non-nesting season extends from October 1-January 31).

If you have any questions regarding this report, please contact me via telephone at 530.217.8952 or email at lachter@dudek.com.

Sincerely,

____

Lisa Achter
Wildlife Biologist

Att.: Appendix A, Special-Status Species with Known or Potential Occurrence in the Vicinity of the Project Study Area
Appendix B, List of Vascular Plant Species Recorded Within the Project Study Area
Appendix C, Results of CNDDB, CNPS and IPaC Searches

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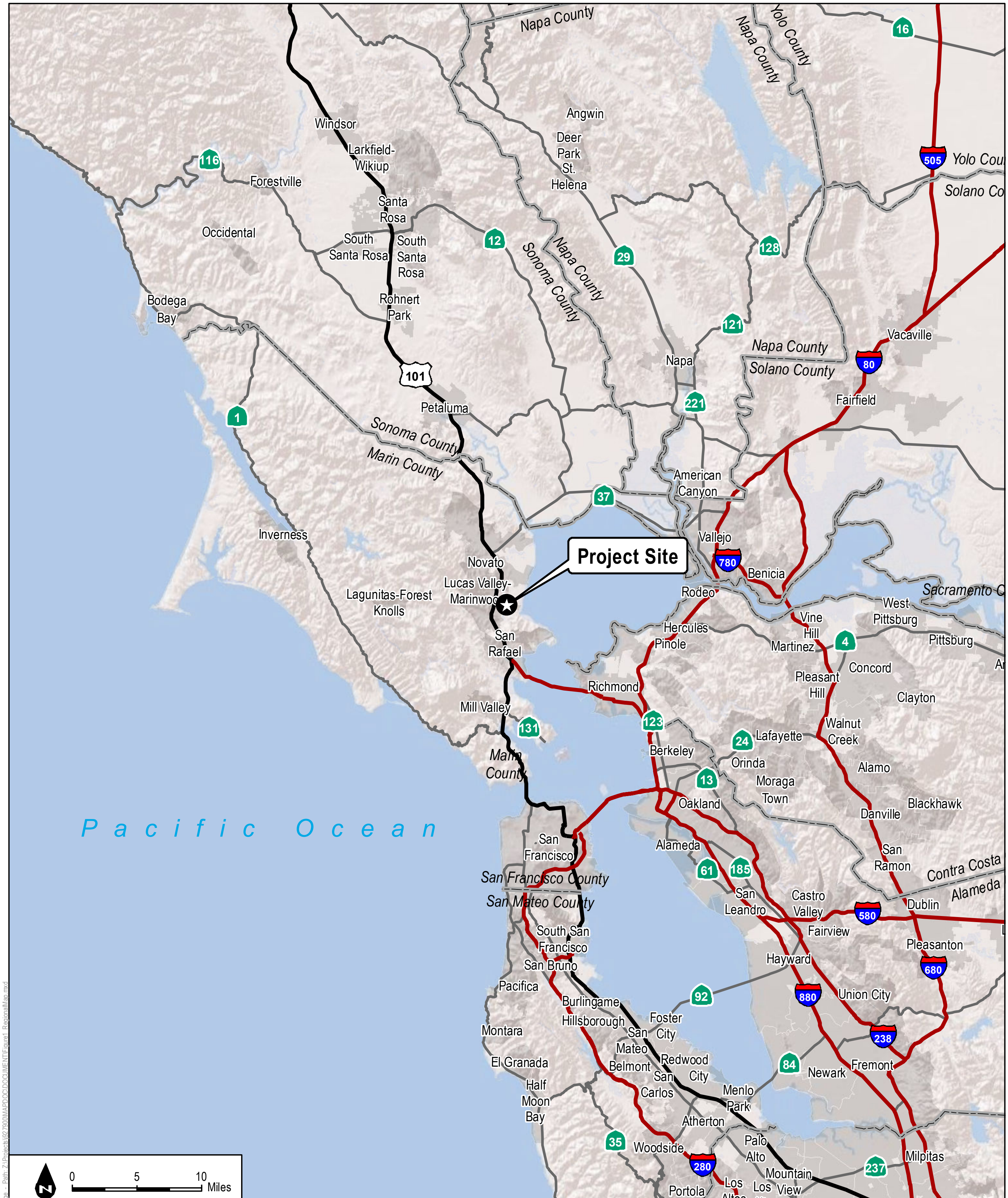

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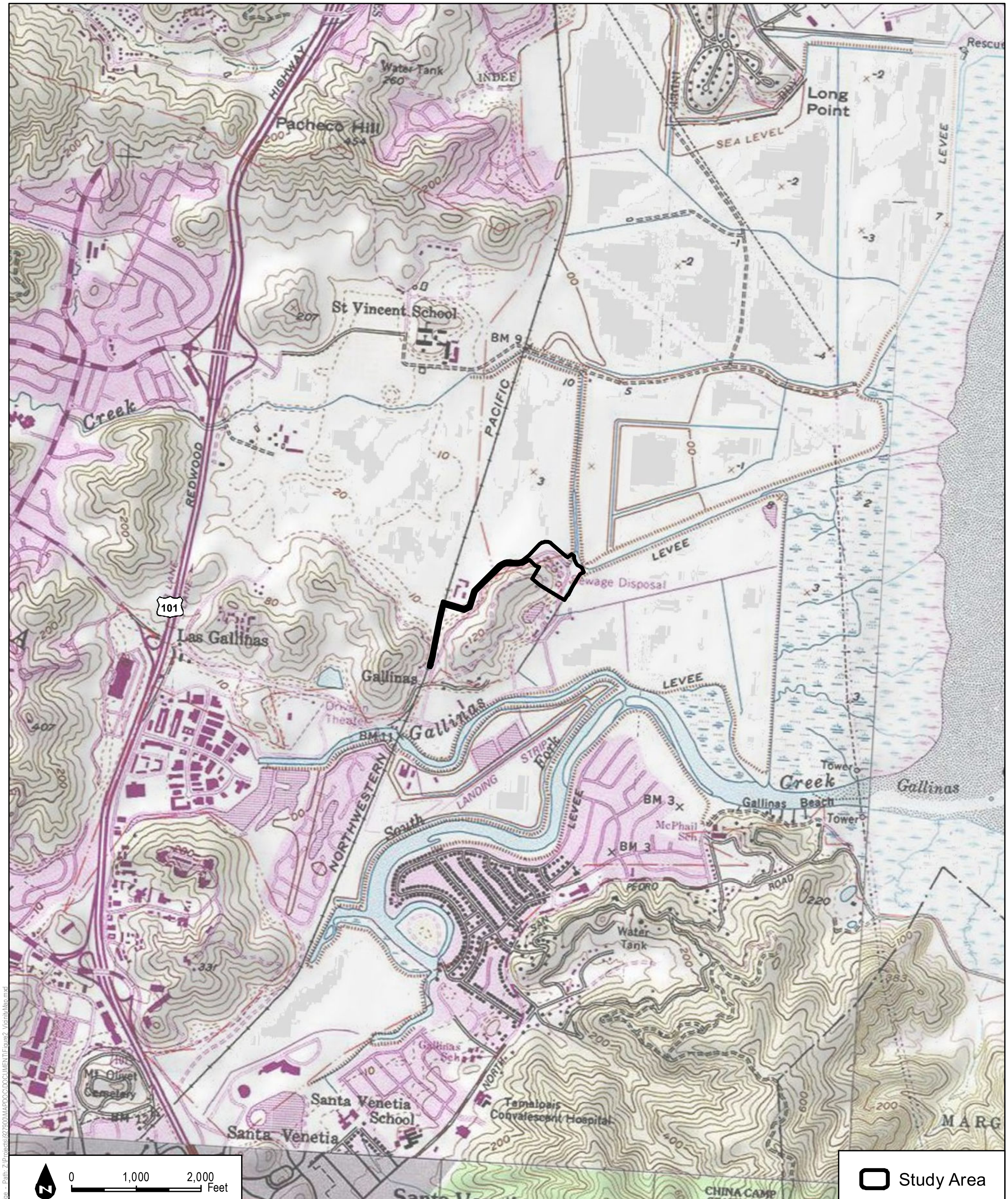
FIGURE 1

Regional Map

Las Gallinas Valley Sanitary District



SOURCE: USGS 7.5-Minute Series Novato Quadrangle

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FIGURE 2

Vicinity Map

Las Gallinas Valley Sanitary District

SOURCE: Bing Maps (Accessed 2016)

FIGURE 3

Site Map

Las Gallinas Valley Sanitary District

SOURCE: SOURCE: Bing Maps (Accessed 2016)

FIGURE 4

Potentially Jurisdictional Features and Vegetation Communities

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Las Gallinas Valley Sanitary District


Photo 1: Annual grassland habitat on west side of project area


Photo 2: Disturbed habitat just west of water tank


Photo 3: Force main alignment through eucalyptus trees


Photo 4: Feature #1


Photo 5: Feature #2


Photo 6: Feature #3

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Las Gallinas Valley Sanitary District

FIGURE 5-1

Site Photographs


Photo 7: Golf course on southwestern side of project site


Photo 8: Looking east across wetlands north of Smith Ranch Road


Photo 9: Looking east at ruderal disturbed habitat on eastern boundary of project


Photo 10: Looking north across backwash basins to water tank on western portion of project


Photo 11: Looking south along force main alignment


Photo 12: Looking northeast toward backwash basins on southeast side of project site

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9279-00

Las Gallinas Valley Sanitary District

FIGURE 5-2

Site Photographs

Photo 13: Looking south toward Las Gallinas Valley Sanitary District

Photo 14: Looking south toward backwash basins on southeastern side of project site

Photo 15: Looking west along Smith Ranch Road at force main alignment

Photo 16: Oak woodland on west side of treatment facility

Photo 17: Smith Ranch Road along northern portion of site

Photo 18: Wetlands outside of project area north of Smith Ranch Road

APPENDIX A

Special-Status Species with Known or Potential Occurrence in the Vicinity of the Project Study Area

Appendix A. Special-Status Species with Known or Potential Occurrence in the Vicinity of the Proposed Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project in Marin County, California.

Common Name	Scientific Name	Federal Status	State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Birds						
bank swallow	*Riparia riparia*	None	Threatened	Bank swallow is found in limited scattered areas in the summer throughout California.	Bank Swallow is a neotropical migrant found primarily in riparian and other lowland habitats in California west of the deserts during the spring-fall period. Bank Swallow forages by hawking insects during long, gliding flights. Feeds predominantly over open riparian areas, but also over brushland, grassland, wetlands, water, and cropland. Feeds on a wide variety of aerial and terrestrial soft-bodied insects including flies, bees, and beetles. Uses holes dug in cliffs and river banks for cover. Will also roost on logs, shoreline vegetation, and telephone wires. Predominantly a colonial breeder.	No potential to occur. No nesting habitat exists for this species on the project site.
burrowing owl	*Athene cunicularia*	None	SSC	Burrowing owl is found throughout California in open areas and grasslands.	The burrowing owl utilizes abandoned ground squirrel burrows in open habitats and grasslands, also disturbed areas. Diet consists of insects, small mammals, reptiles and amphibians. Commonly uses burrows on levees or mounds where there are unobstructed views of predators such as raptors or foxes.	Moderate potential to occur. Ground squirrel burrows and suitable foraging habitat are present on the western edge of the project site, although no burrowing owls or burrowing owl sign (white wash, feathers, pellets, etc.) was present during the survey..
California black rail	*Laterallus jamaicensis coturniculus*	None	Threatened/FP	Black rail is found in limited local areas around the San Francisco Bay Area, California Coast, Lower Colorado River and Salton Sea.	Black rail is a yearlong resident of saline, brackish and fresh emergent wetlands. Black rail is carnivorous and gleans isopods, insects, and other arthropods from surface of mud and vegetation. Occurs most commonly in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass. Usually found in immediate vicinity of tidal sloughs.	Low potential to occur. Suitable foraging and nesting habitat is present on the project site.
California clapper rail	*Rallus longirostrus obsoletus*	Endangered	Endangered/FP	Clapper rail is found in limited local areas around the San Francisco Bay Area, California Coast, Lower Colorado River and Salton Sea.	Locally common yearlong in coastal wetlands and brackish areas. Forages in higher marsh vegetation, along vegetation and mudflat interface, and along tidal creeks. Gleans, pecks, probes, and scavenges from surface. Along coast, preys on crabs, mussels, clams, snails, insects, spiders, and worms. Also takes mice during high tides, and may scavenge dead fish. Prefers fresh or brackish emergent wetland dominated by pickleweed, cordgrass, and bulrush.	Low potential to occur. Suitable foraging habitat is present on the project site.
California least tern	*Sterna antillarum browni*	Endangered	Endangered/FP	California least tern is found in limited areas throughout the California Coast and San Francisco Bay.	Breeding colonies are located in southern California along marine and estuarine shores, and in San Francisco Bay in abandoned salt ponds and along estuarine shores. Feeds in nearby shallow, estuarine waters where small fish are abundant. Adult roosts primarily on the ground. Young chicks, 3 days old and older, are brooded less often by parents, and require wind blocks and shade. Reproduction: Nests in loose colonies in areas relatively free of human or predatory disturbance. Abandons nesting areas readily if disturbed.	Very low potential to occur. Estuarine shoreline is not present on project site and existing estuarine habitat is of low quality. The site is regularly disturbed by humans, pets and facility operations...
northern spotted owl	*Strix occidentalis caurina*	Threatened	Candidate Threatened/SSC	Northern spotted owl is found throughout California from sea level to approximately 2,300 meters.	In northern California, spotted owl resides in dense, old-growth, multi-layered mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2300 meters. In southern California, nearly always associated with oak and oak-conifer habitats. Feeds in forest habitats upon a variety of small mammals, including flying squirrels, woodrats, mice and voles, and a few rabbits. Also eats small birds, bats, and large arthropods. Uses dense, multi-layered canopy cover for roost seclusion. Roost selection appears to be related closely to thermoregulatory needs; intolerant of high temperatures. Roosts in dense overhead canopy on north-facing slopes in summer. In winter, roosts in oak habitats.	No potential to occur. Mature, dense, multi-layered forest habitat is absent from the project site.

Common Name	Scientific Name	Federal Status	State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Swainson's hawk	*Buteo swainsoni*	None	Threatened	Swainson's Hawk is a common breeding resident in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen Co., and Mojave Desert.	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah and grasslands in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Consumes mice, gophers, ground squirrels, rabbits, large arthropods, amphibians, reptiles, birds, and, rarely, fish. Roosts in large trees, but will roost on ground if none available. Nests on a platform of sticks, bark, and fresh leaves in a tree, bush, or utility pole from 1.3 to 30 m (4-100 ft) above ground. Nests in open riparian habitat, in scattered trees or small groves in sparsely vegetated flatlands.	Low potential to occur. Appropriate foraging and roosting habitat is not present on the project site.
short-eared owl	*Asio flammeus*	None	SSC	Short-eared owl is found throughout California in low to middle elevations, primarily grasslands.	Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Feeds primarily on voles and other small mammals. Birds are an important food source in coastal wintering areas, and during the nesting season. Also eats reptiles, amphibians, and arthropods. Nests on dry ground in a depression concealed in dense vegetation and lined with grasses, forbs, sticks, and feathers Tall grasses, brush, ditches, and wetlands are used for resting and roosting cover.	Moderate potential to occur. Suitable nesting and foraging habitat exists on the project site.
tri-colored blackbird	*Agelaius tricolor*	None	Candidate Threatened/SSC	Tri-colored blackbird is found in riparian habitats at low to moderate elevations throughout California.	Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats. Diet consists primarily of invertebrates including insects and spiders, as well as seeds and cultivated grains. Seeks cover in emergent wetland vegetation, especially cattails and tules; also in trees and shrubs. Roosts in large flocks in emergent wetland or in trees.	Low potential to occur. Suitable foraging, roosting and breeding habitat is present adjacent to the project site.
western snowy plover	*Charadrius alexandrines nivosus*	Threatened	SSC	Western snowy plover is found throughout California along the coast and adjacent to large often saline lakes at inland sites.	In fall and winter, common on sandy marine and estuarine shores. Nests locally in these same habitats from April through August, as well as on salt pond levees. Inland nesting areas occur at the Salton Sea, Mono Lake, and at isolated sites on the shores of alkali lakes in northeastern California, in the Central Valley, and southeastern deserts.	Very low potential to occur. Marginal nesting and foraging habitat is present on the project site.
yellow warbler	*Setophaga petechia*	None	SSC	Yellow warbler is found throughout California in the summer and in limited areas in extreme southern California during winter.	Breeds in riparian woodlands from coastal and desert lowlands up to 2,500 m (8,000 ft) in the Sierra Nevada Mountains. Also breeds in montane chaparral, and in open ponderosa pine and mixed conifer habitats with substantial amounts of brush. Mostly eats insects and spiders. Gleans and hovers in upper canopy of deciduous trees and shrubs. Occasionally hawks insects from air, or eats berries. Usually found in riparian deciduous habitats in summer: cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland.	Low potential to occur. Very limited woodland or riparian habitat present on the project site. Minimal deciduous habitat present on the project site.
Mammals						
salt marsh harvest mouse	*Reithrodontomys raviventris*	Endangered	Endangered	Salt marsh harvest mouse is found in saline emergent wetlands of San Francisco Bay and its tributaries.	Salt marsh harvest mouse inhabits pickleweed saline emergent wetland where it may be locally common. Grasslands adjacent to pickleweed marsh are used, but only when new grass growth affords suitable cover in spring and summer months. Non-submerged, salt-tolerant vegetation for escape during highest tides is essential. Pickleweed and saltgrass are main food sources.	Low potential to occur. Suitable habitat is present on site, however, the nearest occurrence record is over six miles from the site.
Townsend's big-eared bat	*Corynorhinus townsendii*	None	Candidate Threatened	Townsend's big-eared bat is found in most habitats throughout California.	Townsend's big-eared bat is found throughout California in all but subalpine and alpine habitats, and may be found at any season throughout its range. Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. May use separate sites for night, day, hibernation, or maternity roosts. Hibernation sites are cold, but not below freezing. Maternity roosts are warm. Roosting sites are the most important limiting resource. Small moths are the principal food of this species. Beetles and a variety of soft-bodied insects also are taken.	Moderate potential to occur. Suitable roosting and foraging habitat is present on the project site.

Common Name	Scientific Name	Federal Status	State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Amphibians						
California red-legged frog	*Rana draytonii*	Threatened	None	California Red-Legged Frog is found throughout California at a variety of elevations.	The California red-legged frog inhabits quiet pools of streams, marshes, and ponds. Prefers shorelines with extensive vegetation. Usually escapes to water 1 meter deep or more, at the bottom of pools. Adults take aquatic and terrestrial insects and crustaceans and snails, as well as worms, fish, tadpoles, smaller frogs, and small mammals. Aquatic larvae are mostly herbivorous.	Very low potential to occur. Potentially suitable breeding ponds are present on the project site. Marginally suitable man-made ponds are present on adjacent property as golf course water features but are unlikely to support red-legged frog due to frequent disturbance.
California tiger salamander	*Ambystoma californiense*	Threatened	Threatened	California Tiger Salamander is found throughout the western part of Central California at low and medium elevations.	The California tiger salamander is most commonly found in annual grassland habitat with ponds for breeding, but also occurs in the grassy understory of valley-foothill hardwood habitats, and uncommonly along stream courses in valley-foothill riparian habitats. Adults spend most of the year in subterranean refugia, especially burrows of California ground squirrels and likely feed on earthworms, snails, insects and small fish.	No potential to occur. The site is outside of the historical range of the species and no suitable habitat exists within or adjacent to the site.
Fishes						
longfin smelt	*Spirinchus thaleichthys*	Candidate Threatened	Threatened	The range of the longfin smelt extends from Alaska to the San Francisco Bay-Delta which includes the Delta, Suisun Marsh, San Pablo Bay, and the San Francisco Bay to the Golden Gate Bridge. The range is made up of at least 20 scattered populations found in estuaries, rivers, and lakes stretching from California to Alaska.	The longfin smelt is a pelagic estuarine fish. Longfin smelt generally spawn in freshwater and then move downstream to brackish water to mature. The life cycle of most longfin smelt generally requires estuarine conditions. Juvenile and adult longfin smelt have been found throughout the year in salinities ranging from pure freshwater to pure seawater, although once past the juvenile stage, they are typically collected in waters with salinities ranging from 14 to 28 parts per thousand. Longfin smelt are thought to be restricted by high water temperatures, generally greater than 22 degrees Celsius (°C).	No potential to occur. No suitable freshwater or estuarine habitat exists on the project site; however, potentially suitable habitat is present in Miller Creek located immediately outside the project area to the northeast and east of the project area.
coho salmon – central California coast ESU	*Oncorhynchus kisutch* (NMFS)	Endangered	Endangered	Coho salmon are found in coastal streams from Monterey Bay north in California.	Adult coho salmon enter fresh water from September through January in order to spawn. In the short coastal streams of California, migration usually begins between mid-November and mid- January. Arrival in the upper reaches of these streams generally peaks in November and December. Coho salmon move upstream after heavy rains have opened the sand bars that form at the mouths of many California coastal streams, but may enter larger rivers earlier.	No potential to occur. Suitable habitat for this species is not present within or adjacent to the project area.
steelhead - central California coast DPS	*Oncorhynchus mykiss irideus* (NMFS)	Threatened (Designated Critical Habitat)	None	The central California coastal steelhead population is found in coastal streams from the Russian River in Sonoma County south to Soquel creek in Santa Cruz county. It is also found in tributaries of San Francisco and San Pablo bays.	Juvenile central California coastal steelhead spends one to two years rearing in freshwater before migrating to estuaries as smolts, and then to the ocean to mature. They remain at sea for up to three years before returning to fresh water to spawn in December-March. They require cold water streams with adequate amounts of dissolved oxygen and gravel substrate free of excessive silt to spawn.	No potential to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Invertebrates						
California freshwater shrimp	*Syncaris pacifica*	Endangered	Endangered	California freshwater shrimp are restricted to a few coastal streams in Napa, Sonoma and Marin counties in California, with restricted habitat tolerance.	California freshwater shrimp is found in low to moderate gradient creeks and streams where there is some emergent vegetation, high water quality, low levels of pollution and good oxygen levels. Some salinity is tolerated, although they are not found in any tidally influenced or brackish waters. Oviposition occurs in late spring and eggs hatch in June.	No potential to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Plants						
Baker's larkspur	*Delphinium bakeri*	Endangered	Endangered,/CRPR 1B.1	Baker's larkspur is known from only one extant occurrence along Salmon Creek in Marin County. Nearly extinct; as of July 2011, seven plants remain.	Baker's larkspur is a perennial herb in the Ranunculaceae family. It is found from 80 to 305 meters in often mesic decomposed shale. Most likely to occur in broadleaved upland forests, coastal scrub, or valley and foothill grassland. Blooms from March to May.	Extremely low potential to occur. Suitable soil types and vegetation communities are absent from the project site.
Contra Costa goldfields	*Lasthenia conjugens*	Endangered	None, CRPR 1B.1	Contra Costa goldfields are endemic to California and found from Mendocino county to Santa Barbara county along the coast.	Contra Costa goldfields is an annual herb from the family Asteraceae. It is found from 0-180 meters in mesic (moist) habitats. Common in wetlands and vernal pools, although occasionally found in non-wetlands. Blooms from March to June.	Low potential to occur. Marginally suitable conditions for this species exist on the project site.

Common Name	Scientific Name	Federal Status	State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
golden larkspur	*Delphinium luteum*	Endangered	Rare, CRPR 1B.1	Golden larkspur is known from fewer than 20 occurrences and is limited to Marin County and Sonoma County.	Golden larkspur is a perennial herb from the family Ranunculaceae. It is found in rocky soils and is most likely to occur in chaparral, coastal prairie or coastal scrub habitats.	Extremely low potential to occur. Suitable soil types and vegetation communities are absent from the project site.
Marin western flax	*Hesperolinon congestum*	Threatened	Threatened, CRPR 1B.1	Marin western flax is found in the western portionof the San Francisco Bay Area.	Marin western-flax is an annual herb from the Linaceae family. It is associated with serpentine soils and is most common in chaparral and valley and foothill grassland habitats. Blooms from April to July.	Extremely low potential to occur. Suitable soil types and vegetation communities are absent from the project site.
North Coast semaphore grass	*Pleuropogon hooverianus*	None	Threatened, CRPR 1B.1	North Coast semaphore grass is found at sites in coastal northern California in Marin, Sonoma and Mendocino Counties.	North Coast semaphore grass is a perennial grass in the Poaceae family. It grows in mesic conditions in open areas. Most commonly found in broadleaved upland forest, meadow and seep or north coast coniferous forest habitat. Blooms from April to June.	Low potential to occur. Suitable upland forest and freshwater habitat is not present on the project site.
Santa Cruz Tarplant	*Holocarpha macradenia*	Threatened	Threatened, CRPR 1B.1	Santa Cruz tarplant is endemic to California and is limited to a few introduced populations in the San Francisco Bay Area and Santa Cruz and Monterey Counties.	Santa Cruz tarplant is an annual herb in the Asteraceae family. It grows most often in sandy clay soils from 10-220 meters and is most likely to occur in coastal prairie, coastal scrub or valley and foothill grasslands. Blooms from June to October.	Low potential to occur. Suitable coastal prairie, valley and foothill grassland and coastal scrub habitat is not present on the project site.
soft salty birds-beak	*Chloropyron molle ssp. molle*	Endangered	Rare, CRPR 1B.2	Soft salty birds-beak is endemic to California and limited to Contra Costa, Marin, Napa, Sacramento, Solano and Sonoma Counties.	Soft salty birds-beak is a semi-parasitic annual herb in the Orobanchaceae family. It grows in coastal salt marshes and swamps between 0 and 3 meters above sea-level and blooms from July to November.	Moderate potential to occur. Potentially suitable salt marsh habitat is directly adjacent to the project site.
Sonoma alopecurus	Alopecurus aequalis var. sonomensis	Endangered	None, CRPR 1B.1	Sonoma alopecurus is endemic to California and limited to a few known populations in Marin and Sonoma counties.	Sonoma alopecurus is a perennial grass in the Poaceae family. It grows in freshwater marshes and swamps and riparian scrub habitat between 5 and 365 meters. Blooms from May to July.	No potential to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Sonoma spineflower	*Chorizanthe valida*	Endangered	Endangered, CRPR 1B.1	Sonoma spineflower is endemic to California and limited to a few known populations in Marin and Sonoma counties.	Sonoma spineflower is an annual herb in the Polygonaceae family. It is found from 10 to 305 meters in primarily sandy coastal prairie habitat. It blooms from June to August.	No potential to occur. Coastal prairie habitat is not present on the project site.
Sonoma sunshine	*Blennosperma bakeri*	Endangered	Endangered, CRPR 1B.1	Sonoma sunshine is limited to Sonoma County.	Sonoma sunshine is an annual herb in the Asteraceae family. It is found in mesic grasslands and vernal pool habitat from 10 to 110 meters. Blooms from March to May.	No potential to occur. The project site is outside of the species current known range.
Tiburon jewelflower	*Streptanthus glandulosus ssp. niger*	Endangered	Endangered, CRPR 1B.1	Tiburon jewelflower is endemic to Marin County, and is known for only two occurrences on the Tiburon peninsula.	Tiburon jewelflower is an annual herb in the Brassicaceae family. It is found on serpentine grassland habitat between 30 and 150 meters above sea level. It blooms from May to June.	No potential to occur. The project site is outside of the species current known range.
Tiburon Mariposa-lily	*Calochortus tiburonensis*	Threatened	Threatened, CRPR 1B.1	Tiburon Mariposa-lily is endemic to Marin county and is known from a single occurrence on the Tiburon peninsula.	Tiburon Mariposa-lily is a Perennial bulbiferous herb in the Liliaceae family. It grows on serpentine grassland habitat between 50 and 150 meters elevation and blooms between March and June.	No potential to occur. The project site is outside of the species current known range..
Tiburon paintbrush	*Castilleja affinis var. neglecta*	Endangered	Threatened, CRPR 1B.2	Tiburon paintbrush is endemic to California and is limited to known occurrences in Marin, Napa and Santa Clara counties.	Tiburon paintbrush is a semi-parasitic perennial herb in the Orobanchaceae family. It grows in serpentine grassland habitat between 60 and 400 meters elevation. It blooms between April and June.	No potential to occur. Suitable habitat for this species is not present on the project site.
Two-fork clover	*Trifolium amoenum*	Endangered	None, CRPR 1B.1	Two-fork clover is a California endemic species limited to the San Francisco Bay Area.	Two-fork clover is an annual herb in the Fabaceae family. It is found in coastal bluff scrub and valley and foothill grassland habitats, occasionally in serpentine soils. It grows between 5 and 415 meters and blooms between April and June.	No potential to occur. Suitable habitat for this species is not present on the project site.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	Endangered	Endangered, CRPR 1B.1	White-rayed pentachaeta is endemic to California and is limited to Marin, Santa Cruz and Sonoma Counties.	White-rayed pentachaeta is an annual herb in the Asteraceae family. It is found in coastal woodland habitat and Valley and grassland habitat, often in serpentine soils. It grows between 35 and 620 meters elevation and blooms from March to May.	Low potential to occur. Appropriate coastal woodland or grassland habitat for this species is not present on the project site.

SSC- California Species of Special Concern
FP- California Fully Protected
CRPR- California Rare Plant Rank

The preceding list of wildlife potentially occurring in the project area was generated from the following resources:

- USFWS IPaC Trust Resources Report (Sacramento Fish and Wildlife Office, Accessed December 8, 2015)

- CDFW CNDDB Rarefind (Accessed December 8, 2015)
- CNPS Rare and Endangered Plant Inventory (Accessed December 8, 2015)

<u>Sources</u>:

<u>Published References</u>:

California Wildlife Habitat Relationships (CWHR) Life history accounts. California Department of Fish and Wildlife (CDFW) Sacramento, CA.

CNPS Rare and Endangered Plant Inventory.

Grinnell, J. and A. H. Miller. 1944. The distribution of the birds of California. Pacific Coast Avifauna 27. Berkeley, CA

APPENDIX B

List of Vascular Plant Species Recorded Within the Project Study Area

Appendix B – Plant Species Observed during the Field Visit

Scientific Name	Common Name	Native (Y/N)	Wetland Indicator Status
Rumex crispus	curly dock	Y	FAC
Centaurea solsititalis	yellow star thistle	N	UPL
Unk. Asteraceae (maybe Erigeron sp.)	unknown	Unk.	Unk.
Polypogon monspeliensis	rabbit's foot grass	Y	FACW
Pseudognaphalium luteoalbum	cudweed	Y	FAC
Ludwigia peploides	water primrose	N	OBL
Quercus kelloggii	black oak	Y	UPL
Phalaris aquatica	Harding grass	N	FACU
Erigeron Sp.	aster	Unk.	Unk.
Helminthotheca eschioides	bristly ox-tongue	N	FACU
Salicornia pacifica	pickleweed	Y	OBL
Salsola soda	alkali Russian thistle	N	FACW
Chenopodium sp.	unknown	Unk.	Unk.
Cyperis sp.	unknown	Y	Unk.
Atriplex semibaccata	Australian saltbush	N	FAC
Sesuvium verrucosum	western sea purslane	Y	OBL
Spergularia macrotheca	large-flowered sand spurry	Y	FAC
Distichlis spicata	saltgrass	Y	FAC
Atriplex rosea	redscale	N	FAC
Centromadia sp.	spikeweed	Y	Unk.
Elymus triticoides	blue wild-rye	Y	FACU

APPENDIX C

CNDDB, CNPS and IPaC Search Results

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: (Federal Listing Status is (Endangered or Threatened or Proposed Endangered or Proposed Threatened or Candidate) or State Listing Status is (Endangered or Threatened or Candidate Endangered or Candidate Threatened)) and Quad is (Bolinas (3712286) or Novato (3812215) or Petaluma (3812226) or Petaluma Point (3812214) or Petaluma River (3812225) or San Geronimo (3812216) or San Quentin (3712284) or San Rafael (3712285) or Sears Point (3812224))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Alopecurus aequalis var. sonomensis Sonoma alopecurus	G5T1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	300 300	21 S:1	0	0	0	1	0	0	1	0	1	0	0
Ambystoma californiense California tiger salamander	G2G3 S2S3	Threatened Threatened	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable		1133 S:1	0	0	0	0	1	0	1	0	0	1	0
Blennosperma bakeri Sonoma sunshine	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	30 30	25 S:2	0	1	1	0	0	0	0	2	2	0	0
Buteo swainsoni Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	120 120	2394 S:1	0	0	0	0	1	0	1	0	0	1	0
Callophrys mossii bayensis San Bruno elfin butterfly	G4T1 S1	Endangered None	XERCES_CI-Critically Imperiled	780 780	10 S:1	0	0	0	0	0	1	1	0	1	0	0
Calochortus tiburonensis Tiburon mariposa-lily	G1 S1	Threatened Threatened	Rare Plant Rank - 1B.1	460 460	1 S:1	1	0	0	0	0	0	0	1	1	0	0
Castilleja affinis var. neglecta Tiburon paintbrush	G4G5T1 S1	Endangered Threatened	Rare Plant Rank - 1B.2 SB_UCBBG-UC Berkeley Botanical Garden	350 880	9 S:6	2	2	1	0	0	1	2	4	6	0	0
Charadrius alexandrinus nivosus western snowy plover	G3T3 S2	Threatened None	CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	0 10	121 S:2	0	1	0	0	0	1	1	1	2	0	0
Chloropyron molle ssp. molle soft salty bird's-beak	G2T1 S1	Endangered Rare	Rare Plant Rank - 1B.2	5 5	27 S:3	0	0	0	0	3	0	3	0	0	3	0
Chorizanthe valida Sonoma spineflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	30 30	6 S:1	0	0	0	0	1	0	1	0	0	1	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Corynorhinus townsendii Townsend's big-eared bat	G3G4 S2	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	30 470	619 S:8	1	2	0	0	0	5	3	5	8	0	0
Delphinium bakeri Baker's larkspur	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden		6 S:1	0	0	0	0	0	1	0	1	1	0	0
Delphinium luteum golden larkspur	G1 S1	Endangered Rare	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	150 150	11 S:1	0	0	0	0	0	1	1	0	1	0	0
Eucyclogobius newberryi tidewater goby	G3 S3	Endangered None	AFS_EN-Endangered CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	10 10	117 S:2	0	0	0	0	2	0	2	0	0	0	2
Hesperolinon congestum Marin western flax	G2 S2	Threatened Threatened	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	200 1,200	26 S:12	2	5	2	0	0	3	1	11	12	0	0
Holocarpha macradenia Santa Cruz tarplant	G1 S1	Threatened Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	120 120	37 S:2	0	0	0	0	1	1	2	0	1	1	0
Lasthenia conjugens Contra Costa goldfields	G1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	280 280	33 S:1	0	1	0	0	0	0	0	1	1	0	0
Laterallus jamaicensis coturniculus California black rail	G3G4T1 S1	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	0 20	241 S:22	6	3	1	1	0	11	8	14	22	0	0
Lilium pardalinum ssp. pitkinense Pitkin Marsh lily	G5T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_BerrySB-Berry Seed Bank		4 S:1	0	0	0	0	1	0	1	0	0	1	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Oncorhynchus kisutch coho salmon - central California coast ESU	G4 S2?	Endangered Endangered	AFS_EN-Endangered	130 180	10 S:2	0	1	0	0	0	1	0	2	2	0	0
Oncorhynchus mykiss irideus steelhead - central California coast DPS	G5T2T3Q S2S3	Threatened None	AFS_TH-Threatened	120 400	39 S:2	0	0	1	0	0	1	0	2	2	0	0
Pentachaeta bellidiflora white-rayed pentachaeta	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	120 400	14 S:6	0	0	0	0	5	1	6	0	1	0	5
Pleuropogon hooverianus North Coast semaphore grass	G2 S2	None Threatened	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_BerrySB-Berry Seed Bank SB_RSABG-Rancho Santa Ana Botanic Garden	350 500	26 S:5	1	0	0	1	2	1	3	2	3	2	0
Rallus longirostris obsoletus California clapper rail	G5T1 S1	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List	2 18	98 S:23	3	5	3	0	1	11	12	11	22	1	0
Rana draytonii California red-legged frog	G2G3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	5 965	1376 S:31	3	11	5	0	0	12	2	29	31	0	0
Reithrodontomys raviventris salt-marsh harvest mouse	G1G2 S1S2	Endangered Endangered	CDFW_FP-Fully Protected IUCN_EN-Endangered	0 8	141 S:18	0	6	1	2	1	8	12	6	17	1	0
Riparia riparia bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	25 25	296 S:1	0	0	0	0	0	1	1	0	1	0	0
Spirinchus thaleichthys longfin smelt	G5 S1	Candidate Threatened	CDFW_SSC-Species of Special Concern	0 0	45 S:2	0	0	0	0	0	2	0	2	2	0	0
Streptanthus glandulosus ssp. niger Tiburon jewelflower	G4T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	300 350	2 S:2	0	2	0	0	0	0	0	2	2	0	0
Syncaris pacifica California freshwater shrimp	G1 S1	Endangered Endangered	IUCN_EN-Endangered	120 120	18 S:1	0	0	1	0	0	0	0	1	1	0	0
Thaleichthys pacificus eulachon	G5 S3	Threatened None		0 0	10 S:1	0	0	0	0	0	1	0	1	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Trifolium amoenum two-fork clover	G1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	100 300	26 S:4	0	0	0	0	2	2	4	0	2	1	1

CNPS California Native Plant Rare and Endangered Plant Inventory

Plant List

10 matches found. *Click on scientific name for details*

Search Criteria

Rare Plant Rank is one of [1A, 1B, 2A, 2B], FESA is one of [Endangered, Threatened], CESA is one of [Endangered, Threatened], Found in 9 Quads around 38122A5

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Blennosperma bakeri	Sonoma sunshine	Asteraceae	annual herb	1B.1	S1	G1
Calochortus tiburonensis	Tiburon mariposa lily	Liliaceae	perennial bulbiferous herb	1B.1	S1	G1
Castilleja affinis var. neglecta	Tiburon paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	1B.2	S1	G4G5T1
Chorizanthe valida	Sonoma spineflower	Polygonaceae	annual herb	1B.1	S1	G1
Delphinium bakeri	Baker's larkspur	Ranunculaceae	perennial herb	1B.1	S1	G1
Hesperolinon congestum	Marin western flax	Linaceae	annual herb	1B.1	S2	G2
Holocarpha macradenia	Santa Cruz tarplant	Asteraceae	annual herb	1B.1	S1	G1
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Liliaceae	perennial bulbiferous herb	1B.1	S1	G5T1
Pentachaeta bellidiflora	white-rayed pentachaeta	Asteraceae	annual herb	1B.1	S1	G1
Streptanthus glandulosus ssp. niger	Tiburon jewelflower	Brassicaceae	annual herb	1B.1	S1	G4T1

Suggested Citation

CNPS, Rare Plant Program. 2015. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 08 December 2015].

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U.S. Fish & Wildlife Service

Las Gallinas Valley SD

IPaC Trust Resource Report

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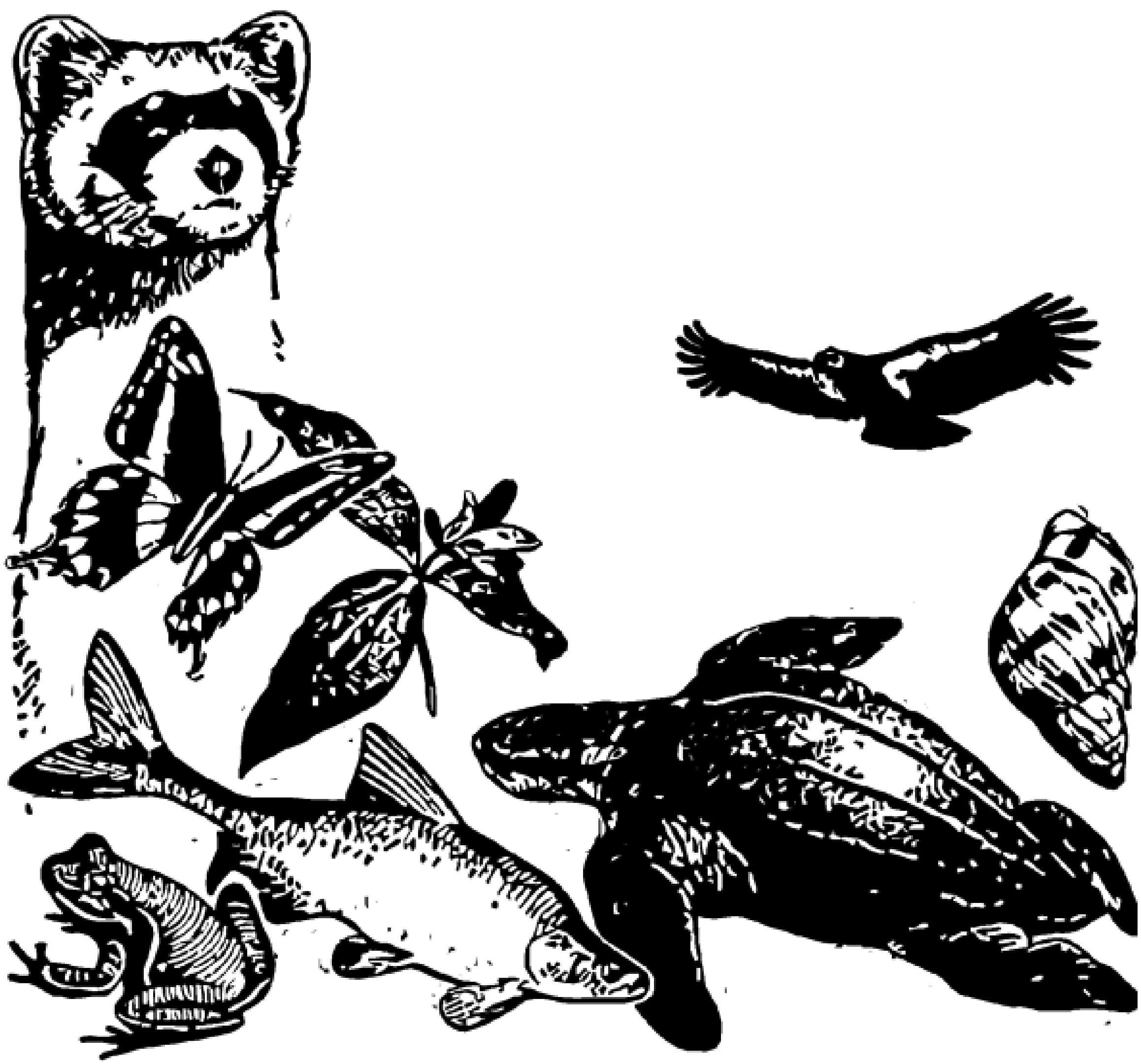
This report is for informational purposes only and should not be used for planning or analyzing project-level impacts. For projects that require FWS review, please return to this project on the IPaC website and request an official species list from the Regulatory Documents page.



US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

Las Gallinas Valley SD

PROJECT CODE

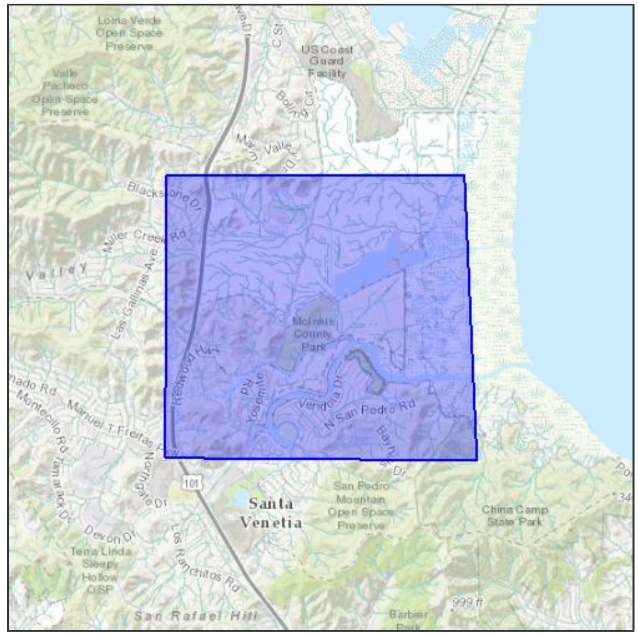
ZSLGB-K55TV-CARNK-SONDT-X6ZQKM

LOCATION

Marin County, California

DESCRIPTION

BTR/CRLF Habitat Assessment



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

San Francisco Bay-delta Fish And Wildlife
650 Capitol Mall
SUITE 8-300
Sacramento, CA 95814
(916) 930-5603

Sacramento Fish And Wildlife Office
Federal Building
2800 COTTAGE WAY, ROOM W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an official species list on the Regulatory Documents page.

Amphibians

California Red-legged Frog Rana draytonii Threatened

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D

Birds

California Clapper Rail Rallus longirostris obsoletus
Endangered

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B04A

California Least Tern Sterna antillarum browni
Endangered

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B03X

Northern Spotted Owl Strix occidentalis caurina
Threatened

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B

Western Snowy Plover Charadrius alexandrinus nivosus
Threatened

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B07C

Crustaceans

California Freshwater Shrimp Syncaris pacifica
Endangered

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K01W

Fishes

Delta Smelt Hypomesus transpacificus — Threatened

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070

Steelhead Oncorhynchus (=Salmo) mykiss — Threatened

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D

Tidewater Goby Eucyclogobius newberryi — Endangered

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E071

Flowering Plants

Marin Dwarf-flax Hesperolinon congestum — Threatened

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1X6

Insects

San Bruno Elfin Butterfly Callophrys mossii bayensis — Endangered

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I00Q

Mammals

Salt Marsh Harvest Mouse Reithrodontomys raviventris — Endangered

MANAGED BY
Sacramento Fish And Wildlife Office

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A03Y

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

Steelhead Critical Habitat Final designated

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D#crithab

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Allen's Hummingbird Selasphorus sasin — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0LI

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Bell's Sparrow Amphispiza belli — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HE

Black Oystercatcher Haematopus bachmani — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0KJ

Black Rail Laterallus jamaicensis — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A

Black Skimmer Rynchops niger — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EO

Black-vented Shearwater Puffinus opisthomelas — Bird of conservation concern
Season: Wintering

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0NC

Common Yellowthroat Geothlypis trichas sinuosa — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B080

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Lesser Yellowlegs Tringa flavipes — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0MD

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HQ

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S

Marbled Godwit Limosa fedoa — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JL

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B078

Nuttall's Woodpecker Picoides nuttallii — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HT

Oak Titmouse Baeolophus inornatus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0MJ

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU

Pink-footed Shearwater Puffinus creatopus — Bird of conservation concern
Year-round

Short-billed Dowitcher Limnodromus griseus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JK

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD

Snowy Plover Charadrius alexandrinus — Bird of conservation concern
Season: Breeding

Song Sparrow Melospiza melodia samuelis — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08Q

Tricolored Blackbird Agelaius tricolor — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06P

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EA

Whimbrel Numenius phaeopus — Bird of conservation concern

Season: Wintering

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JN

Yellow Rail Coturnicops noveboracensis — Bird of conservation concern

Season: Wintering

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JG

Yellow Warbler dendroica petechia ssp. brewsteri — Bird of conservation concern

Season: Breeding

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EN

Red Knot Calidris canutus ssp. roselaari — Bird of conservation concern

Season: Wintering

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G6

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Estuarine And Marine Deepwater

E1UBL	261000.0 acres

Estuarine And Marine Wetland

E2USN	1470.0 acres
E2EM1N	836.0 acres
E2EM1Nh	25.5 acres
E2SBN	20.2 acres
E2SBNx	11.8 acres
E2USMh	0.298 acre
E2USM	0.0763 acre
E2SBNh	0.0334 acre

Freshwater Emergent Wetland

PEM1Ch	53.6 acres
PEM1Ah	2.41 acres
PEM1B	1.53 acres

Freshwater Pond

PUBHh	73.5 acres
PUBHx	5.34 acres
PUBH3h	4.17 acres
PUBKx	0.995 acre

Lake

L2UBHh	20.5 acres

Riverine

R4SBA	44.9 acres
R4SBAx	26.9 acres
R4SBC	18.6 acres
R4SBCx	9.14 acres
R3UBHx	2.3 acres

APPENDIX D

California Red-legged Frog Site Assessment

DUDEK

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March 18, 2016 9279

Ms. Stephanie Standerfer
Albert A. Webb Associates
3788 McCray Street
Riverside, California 92506

Subject: ***California Red-Legged Frog (*****Rana draytonii*****) Habitat Assessment for the Proposed Las Gallinas Valley Sanitary District - Secondary Treatment Upgrade Project, Marin County, California***

Dear Ms. Standerfer:

This California red-legged frog (*Rana draytonii*, CRF) habitat assessment describes the existing conditions within and adjacent to the site of the proposed Las Gallinas Valley Sanitary District (LGVSD) Secondary Treatment Upgrade Project in San Rafael, Marin County, California. This report describes the proposed project and associated project area, CRF occurrence record locations, results of a field reconnaissance survey, descriptions of aquatic and terrestrial habitats, the potential for CRF to occur, and any potential constraints to project implementation.

INTRODUCTION

Dudek conducted a formal habitat assessment for the federally-threatened CRF in accordance with the requirements described in the *U.S. Fish and Wildlife Service Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005).

The approximately 12.65-acre project area is located in San Rafael, California at 300 Smith Ranch Road, approximately one mile east of U.S. Highway 101 and one mile west of the west shore of San Pablo Bay (Figures 1 and 2). The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (U.S. Department of the Interior, Geological Survey Photo-revised 1980) Novato 7.5' quadrangle (Figure 3). The approximate center of the site corresponds to 38°01'30.54" north latitude and 122°31'06.82" west longitude.

Background

The current WWTP facility is an active wastewater treatment plant that serves approximately 30,000 customers in northern San Rafael. The District currently provides secondary treatment of wastewater from mainly commercial and domestic sources within its service area. Effluent is ultimately discharged into Miller Creek, a tributary of San Pablo Bay. During the dry season, effluent is diverted to the District's onsite reclamation facilities which include a marsh pond, irrigated pasture, two storage ponds, and public trails.

Project Description

The proposed project will provide an expansion of the plant's ability to handle peak wet weather daily flows of 18 MGD, doubling the plant's wet weather treatment capacity. In order to add the additional capacity for wet weather treatment, the following key improvements will be implemented within the existing treatment plant footprint: (1) installation of a combined fixed-film, activated sludge process; (2) construction of a 1.2 million gallon equalization basin; (3) addition of a new primary pump station to regulate the flowrate of primary effluent into the secondary treatment portion of the plant; (4) installation of two additional secondary clarifiers; (5) modifications to the existing chlorine contact basin to create sufficient head availability during storm events; (6) expansion of the recycled water facility to treat its designed capacity of 5.4 MGD; and (7) removal of existing Marin Municipal Water District (MMWD) recycled water facility to accommodate the secondary treatment upgrade.

The project will also involve modifications to the existing facility access road and the replacement of an existing force main sewer line serving the treatment plant. These two project components will involve construction activities outside of the existing facility footprint as described below.

Approximately 2,600 feet of new piping will be installed as a part of the replacement of the existing force main along Smith Ranch Road. The new force main will replace an existing force main in the same alignment as the existing line. This work specifically includes replacement of 1800 linear feet of an 18-inch line with a new 24-inch line and replacement of an additional 800 feet of an existing 28-inch line with a new 28-inch line.

The existing access road that extends through the central portion of the facility will be relocated to the eastern periphery of the project site. The proposed alignment will involve the construction of a new paved access roadway and will improve the overall plant layout and move existing public access to outside the plant fence line. In addition, as part of the road relocation, the road will be constructed to address future sea level rise issues along with storm events. The existing laboratory building will be relocated from its current location and up to three utility poles and overhead power lines along the road will be relocated to allow for the access road realignment. As part of this work, the existing backwash/balancing basins associated with the MMWD recycled water facility will be removed to accommodate the installation of the secondary clarifiers and adjacent roadway realignment. This area will be graded and raised as required.

The project will be implemented in three phases to allow for the construction of the new processes while maintaining treatment capabilities with existing treatment processes. By splitting construction into three phases, treatment capabilities are maintained while the new processes are constructed and implemented. The phases will be constructed in series with the total project requiring between 24-30 months for completion.

Environmental Setting

The project area is characterized primarily as developed/disturbed, and the majority of the site is developed with buildings, ornamental landscaping, paved roads and parking areas, gravel lots, and wastewater treatment facilities (Figure 3). Most of the site is flat and generally slopes toward the southeast with elevations varying from approximately 10 feet above mean sea level (AMSL) in the southern portion of the site to about 110 feet AMSL in the western portion of the site. Surrounding land uses include a golf course to the south, nature trails surrounding a wetland complex to the northeast and east, reclaimed diked bay lands to the north and southeast and commercial development to the west, which is surrounded by open space (see Figure 3).

Four soil types are mapped within the project area and includes Blucher-Cole complex, 2-5% slopes, Reyes clay, Saurin-Bonnydoon complex, 15-30% slopes, and Xerorthents. Blucher-Cole complex is a somewhat poorly drained, slightly saline soil that occurs on basin floors and alluvial fans and is derived from sandstone, granite or shale (USDA 2016). Reyes clay is a somewhat poorly drained, highly saline soil that is derived from igneous, metamorphic and sedimentary rock. Saurin-Bonnydoon complex is a somewhat excessively drained soil that is residuum weathered from sandstone and shale that consists of gravelly loam and weathered bedrock. Xerorthents are deposits derived from igneous, metamorphic and sedimentary rock and occur on tidal flats and valley floors.

Species Distribution, Critical Habitat, and Recovery Plan

The CRF was listed as a threatened species by the USFWS on May 23, 1996 (USFWS 1996); and in 2002, the USFWS published the *Recovery Plan for the California Red-Legged Frog* (*Rana draytonii*) (USFWS 2002).

The historic range of the CRF extended along the coast from Marin County, California and inland from Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1994, USFWS 2002). This area includes the Coast Ranges and the west slope of the Sierra Nevada Mountains at elevations below 1,525 meters (5,000 feet). Records of CRF are known from Riverside County to Mendocino County along the Coast Range; from Calaveras County to Butte County in the Sierra Nevada; and in Baja California, Mexico. The subspecies has experienced a 70% reduction in its range in California due to habitat alteration, excessive harvest, and introduction of non-native predators, especially bullfrogs and introduced fish species.

The current range is greatly reduced, with most remaining populations occurring along the coast from Marin County to Ventura County; and in isolated locations in the foothill region of the west slopes of the Sierra Nevada Mountains. CRF are still locally abundant within portions of the San Francisco Bay area (including Marin County) and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse ranges. The species is believed to be extinct from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico.

Adult CRF prefer dense, shrubby or emergent riparian vegetation near deep [≥ 0.7 meters (2.3 feet)], still or slow moving water, especially where dense stands of overhanging willow and an intermixed fringe of cattail occur (Hayes and Jennings 1988). CRF spend most of their lives in and near sheltered backwaters of ponds, marshes, springs, streams, and reservoirs. Deep pools with dense stands of overhanging willows and an intermixed fringe of cattails are considered optimal habitat. Eggs, larvae, transformed juveniles, and adults also have been found in ephemeral creeks and drainages and in ponds that do not have riparian vegetation. Accessibility to sheltering habitat is essential for the survival of CRF within a watershed, and can be a factor limiting population numbers and distribution. Upland areas provide important sheltering habitat during winter when CRF are known to aestivate in burrows and leaf litter. Some CRF have moved long distances over land between water sources during winter rains. Adult CRF documented to move more than 2 miles in northern Santa Cruz County "without apparent regard to topography, vegetation type, or riparian corridors" (Bulger et al. 2003). Most of these overland movements occur at night.

CRF breed from November through April with earlier breeding records occurring in southern localities (Jennings and Hayes 1994). CRF are often prolific breeders, typically laying their eggs during or shortly after large rainfall events in late winter and early spring. Embryos hatch 6 to 14 days after fertilization and larvae require 3.5 to 7 months to attain metamorphosis. Larvae probably experience the highest mortality rates of all life stages, with less than 1% of eggs laid reaching metamorphosis. Sexual maturity normally is reached at 3 to 4 years of age; CRF may live 8 to 10 years. Juveniles have been observed to be active diurnally and nocturnally, whereas adults are mainly nocturnal

CRF Critical Habitat

In September 2000, the U.S. Fish Wildlife Service (USFWS) proposed designation of critical habitat for CRF pursuant to the Endangered Species Act, as amended. On March 13, 2001, the USFWS released its final determinations of critical habitat for the species. Critical habitat is composed of three elements: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat (USFWS 2001). The USFWS's designation of critical habitat was challenged in a lawsuit filed on June 8, 2001 with the U.S. District Court for the District of California by the Home Builders Association of Northern California et al. On November 6, 2002, the court entered a consent decree remanding the designation to the USFWS to conduct an economic analysis in accordance with the Tenth Circuit's decision in New Mexico Cattle Growers Association vs. U.S. Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001). The consent decree vacated the critical habitat designation for the CRF, with the exception of two units not known to be occupied by the frog, and ordered the USFWS to promulgate a proposed revised designation by March 2004, and a final revised rule by November 2005.

In accordance with the consent decree, the USFWS published a revised critical habitat proposal on April 13, 2004, which proposed the re-designation of the previously established units. Based on comments received and the USFWS's re-evaluation of their selection criteria, and the primary constituent elements required by the CRF, the USFWS re-proposed (on November 3, 2005) the designation of 737,912 acres (ac) (298,622 hectares [ha]) of critical habitat in 23 California counties. On April 13, 2006, the USFWS issued a final rule designating approximately 450,288 ac (182,225 ha) of critical habitat within 20 counties.

On September 16, 2008, the USFWS proposed to revise the critical habitat boundaries again to include approximately 1,804,865 acres (ac) (730,402 ha) of critical habitat in 28 California counties, an increase of approximately 1,354,577 ac (548,177 ha). Final critical habitat designation for CRF occurred on March 17, 2010 (75 FR 12816 12959). In total, the revised final designation of critical habitat for CRF resulted in approximately 1,636,609 ac (662,312 ha) of critical habitat designated in 27 California counties.

Based on the locations of designated critical habitat units in Marin and Sonoma counties, the project does not occur within or adjacent to critical habitat for CRF. However, two critical habitat units (MRN-2 and SON-3) occur greater than 11 miles northwest of the site.

CRF Recovery Plan

The Recovery Plan for the California Red-legged Frog was published by the USFWS on May 28, 2002 (USFWS 2002) which defined actions needed to recover the species to sufficient numbers throughout all or part of their range with the goal of de-listing. Recovery objectives in the recovery plan include: 1) protecting existing populations by reducing threats; 2) restoring and creating habitat that will be protected and managed in perpetuity; 3) surveying and monitoring populations and conducting research on the biology of and threats to the species; and 4) re-establishing populations of the species within its historic range.

California Red-legged Frog Occurrence Records

A CNDDB records search was conducted for the Novato USGS 7.5-minute quadrangle and the surrounding eight quadrangles (CNDDB 2003, December 2015 update). Based on this search, there are no occurrence records for CRF within one-mile of the project area. The nearest documented occurrences are located greater than 10 miles west-southwest and north-northeast of the project area (Figure 4).

Aquatic Habitats within the Project Area

Aquatic habitats observed within the project area included two backwash/balancing ponds located in the southeast corner of the project area (associated with the water recycling component of the facility), and three, small seasonal wetland features located along Smith Ranch Road within the alignment of the proposed force main replacement.

Aquatic Habitats within 1.6 kilometers (km) (1 Mile) of the Project Area

Based on aerial photography and topographic maps, a variety of aquatic features occur within 1.6 km (1.0 mi) of the project, including both perennial and seasonal ponds, seasonal wetlands (both freshwater and brackish water), ephemeral drainages, intertidal channels, and reclaimed baylands (Figure 5).

Intertidal channels within 1.6 km of the project area contain brackish water and do not provide suitable aquatic habitat for CRF. Additionally, the reclaimed diked baylands located immediately to the north, northwest, east, and southeast of the project area are also saline environments. Most of the plant species in these areas are salt tolerant and include pickleweed (*Salicornia pacifica*), alkali russian thistle (*Salsola soda*), Australian saltbush (*Atriplex semibaccata*), western sea purslane (*Sesuvium verrucosum*), and saltgrass (*Distichlis spicata*) and as a result, do not provide suitable upland habitat when dry, or suitable aquatic habitat when inundated due to the saline conditions.

To the west, there are at least four seasonal wetlands and several short ephemeral drainage channels within 0.75 miles of the project area. These seasonal wetland features and the drainages lack margin or aquatic vegetation and all are shallow water features and do not provide suitable breeding habitat for CRF.

To the northwest of the project area, there are at least three seasonal wetlands, an agricultural/cattle pond, two ephemeral drainage channels, and Miller Creek. The seasonal wetlands, agricultural/cattle pond, and ephemeral drainages all lack margin and aquatic vegetation, and the seasonal wetlands and ephemeral drainages are all shallow water features and do not provide suitable breeding habitat for CRF. The Miller Creek channel contains riparian vegetation throughout most of its length and could provide summer refugia for CRF; however, it is highly unlikely that the creek provides suitable breeding habitat since it is highly channelized and fairly narrow and runoff flows and associated water velocities during the winter (CRF breeding period) would likely preclude the creek as breeding habitat. To the north, northeast, east, and southeast of the project area, the majority of the aquatic features are located within reclaimed diked baylands or along the margin of the baylands. Several small drainage channels occur north of the project area along the margin of the reclaimed diked baylands, but do not provide suitable breeding habitat for CRF. At least two seasonal wetlands occur within these reclaimed diked baylands; however, these features are saline in nature and do not provide suitable habitat for CRF. The terminal end of Miller Creek also occurs to the north of the Project Area at the western extent of the reclaimed diked baylands, where it becomes a tidal channel before entering the bay. This tidal channel flows south along the eastern side of the facility before turning east before entering the bay. In addition, a canal that conveys runoff from the uplands west of the site crosses the reclaimed diked baylands immediately north of the Project area and flows into the Miller Creek/tidal channel. During periods of high runoff from the uplands to the west, water typically overtops the canal flooding portions of the reclaimed diked bayland. However, due to the saline conditions within the reclaimed diked baylands, these seasonal wetlands also appear to be saline. Several small drainage channels are also present north of the project area along the western margin of the reclaimed diked baylands, but do not provide suitable breeding habitat for CRF.

Immediately south of the project area, there are two golf course ponds within the McInnis Park Golf Center and a large perennial pond located between the golf course and immediately west of the project boundary. Additionally, there is a short drainage southeast of the ponds that conveys excess water from the golf course northeasterly into the reclaimed diked baylands, appears to function only during and shortly after rainfall events. The drainage appears to be somewhat saline based on the presence of pickleweed, although cattails and ruderal vegetation was also present within the drainage. The perimeters of the two golf ponds contain areas with open banks as well as dense cattails and could potentially provide suitable breeding habitat for CRF; however, the presence of golfers in close proximity to these ponds makes presence or breeding highly unlikely. The other large perennial pond contains cattails along the majority of the pond perimeter with limited open banks for basking, but also provides potentially suitable breeding habitat. Approximately 0.65 miles southwest of the project area is another perennial pond located adjacent to a residential area (condominium complex). This pond contains a fringing margin of cattails with very limited basking habitat; however, this pond could also potentially provide suitable breeding habitat for CRF if predatory fish were not present.

METHODS

On December 9, 2015, Dudek senior aquatic ecologist Craig Seltenrich (see qualifications in Appendix A) conducted a habitat assessment for CRF within all appropriate aquatic habitats and associated upland areas within and adjacent to the project area (Figure 6). Potential aquatic and terrestrial habitat areas evaluated as part of this assessment included two backwash ponds, upland habitat surrounding the two backwash ponds, and all other upland areas containing vegetation or potential underground or cover refugia within the project area.

Aquatic habitat evaluations were conducted by walking the perimeter of ponds, along drainages, and through adjacent upland area, as well as other upland areas within the project Area, and recording general and specific habitat conditions (e.g., habitat type and location, vegetation, habitat parameters, upland habitat information). Additionally, photographs were taken to document habitat conditions and potential suitability for CRF.

The habitat assessment was based primarily on habitat requirements as described in the Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog, August 2005 (USFWS 2005), and on extensive experience and knowledge of the author. Aquatic habitats or potential aquatic habitats and adjacent uplands were evaluated by assessing their potential to support breeding and foraging activities, provide summer refuge and/or aestivation habitat, and serve as dispersal corridors for adult and juvenile frogs. In addition, habitats were also evaluated based on personal knowledge and experience with CRF in northern and central California. Information collected during the site survey and from environmental documents included data on the following site characteristics:

- Terrain – elevation and topography
- Land use – historic and current for the project area and adjacent lands
- Plant communities
- Upland habitat
- Aquatic habitat types and aquatic features - vegetation present, water surface area and depth, approximate drying date of water body
- Potential underground refugia
- Potential foraging habitat
- Potential breeding habitat

The CNDDB was queried for CRF occurrences within the Novato, Petaluma, Petaluma River, Petaluma Point, Sears Point, San Geronimo, Bolinas, San Rafael, and San Quentin California, 7.5-minute quadrangles (see Figure 4). Other resources reviewed as part of this assessment include aerial photographs (Google Earth 2015).

RESULTS

Vegetation Communities and Land Cover Types

Vegetation communities and land cover types present within the 12.65-acre project area were evaluated and delineated on a map during the field reconnaissance survey. An aerial photograph (Google Earth 2015) with an overlay of the property boundary and surrounding buffer was utilized to map the vegetation communities and record any special-status species observations or sensitive biological resources while in the field.

Four land cover types exist on the project site (Figure 7). The majority of the site is made up of developed/disturbed habitat which includes the buildings, paved areas and gravel lots, ornamental landscaping, and upland areas that contain a mixture of weedy ruderal plant species and non-native annual grasses. Annual grassland land cover type is found in a small area between the eucalyptus (*Eucalyptus* spp.) grove to the west and Smith Ranch Road. The eucalyptus grove consists of approximately six eucalyptus trees that are interspersed among annual grassland habitat. A small area of oak woodland exists in the center of the site on the hillside to the west of the wastewater treatment facility. This area contains annual grassland habitat interspersed predominantly with oaks (*Quercus* spp.), cottonwood (*Populus* spp.) and eucalyptus. These land cover types are described in detail below. Annual grassland and oak woodland land cover types are described in more detail below.

Annual Grassland

Annual grassland vegetation community mapped during the survey is dominated by a dense to sparse cover of annual, non-native grasses and forbs. Common species include brome grass, Italian ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*)*,* orchard grass (*Dactylis glomerata*), barley, filarees (*Erodium* spp.), and others. However, native species are also often present in this grassland, including bulbs, legumes, and some grasses, such as blue wildrye (*Elymus glaucus*). Ruderal species are also often present in grasslands, especially along the margins of grasslands and in areas that have been historically disturbed. All of the grass species are dormant during the dry summer months.

Oak Woodland

Oak Woodland occurs in a narrow band to the west of the wastewater treatment facility. This stand of approximately a dozen trees consists primarily of coast live oak (*Quercus agrifolia*), cottonwood (*Populus* spp.) and eucalyptus. The understory consists primarily of non-native grassland species including wild oats, ripgut brome (*Bromus diandrus*), wild radish (*Raphanus sativus*), and wild mustard (*Brassica* spp.).

Aquatic Habitat Descriptions

Backwash/Balancing Basins

Two backwash/balancing basin) occur within the project area (Figure 8). These basins are located in the southeast corner of the project area, are man-made features and function as part of the treatment plant's recycled water operation. The hydrology of these basins is artificial and is largely a function of the water that is piped into and out of these basins during the recycled water treatment process. Other inputs are limited to direct precipitation and a very limited amount of overland flow as the area surrounding these features has been highly modified. The basins are nearly identical in size (Basin A on the north is approximately 110 feet long by 110 feet wide, and Basin B located immediately south of Basin A is approximately 90 feet wide by 100 feet long), shape, and depth (each pond has a maximum depth of about 10 feet). Both basins are choked with cattails (*Typha* sp.) and lack open water areas. The steeply sloping banks of each pond are also densely covered with cattails and Himilayan blackberry (*Rubus armeniacus*) and as a result, basking habitat is not present around the margin of either basin. A small amount of basking habitat is available on the elevated berm between the two basins but is not sufficiently close to the water in either basin to be utilized for basking. At the time of the survey, a small amount of water was present in both basins with a maximum water depth of less than 12 inches.

Additionally, there are three, small seasonal wetlands located along the southern side of Smith Ranch Road and appear to hold runoff from the adjacent hillside and drain to the open fields on the northern side of the road via a culvert that passes under the road. These three features appear to be independent of each other and exhibit evidence of wetland hydrology. None of these seasonal wetlands provide suitable habitat for CRF due to the small size and shallow depth, lack of vegetative cover, limited hydro-period, and proximity to the entrance road.

Upland Habitat Surrounding the Two Basins

As noted above, the uplands immediately surrounding the two backwash/balancing basins (within 50 feet of the basins) consist primarily of dense Himalayan blackberry, with scattered eucalyptus (*Eucalyptus* spp.), an unidentified ornamental pine, and several palm trees. Outside of this narrow buffer zone, upland habitat has been highly modified and consists of developed/disturbed areas to the southwest, west, northwest, and north (within the project area) of the basins; reclaimed diked baylands to the northeast and east; and a golf course (McInnis Park Golf Center) to the south. None of these areas provide suitable upland habitat or cover for CRF.

SUMMARY/CONCLUSIONS

The nearest documented occurrences of CRF are located greater than 10 miles west-southwest and north-northeast of the project area.

Potential CRF habitat within the project area is limited to the two backwash/balancing basins and surrounding upland habitat located in the southwestern portion of the project area. The bottoms of both of these ponds contain dense cattails with no open water areas, and the steep banks consist of additional cattail and dense Himalayan blackberry. Limited basking habitat is present on the berm between the two basins; however, this area is a substantial distance from water in both basins and is not likely to be utilized by CRF. Upland cover habitat around the ponds is limited and generally restricted to a 50 foot buffer around the ponds. Beyond this buffer area, very little upland habitat is available for this species due to development/disturbance immediately north and east of the basins, and a golf course south and west of the ponds. Additionally, most of the surrounding areas that have not been developed or disturbed consist of saline habitats within reclaimed diked baylands adjacent to the project area.

Based on the location of the project area adjacent to the bay and relatively saline environments, the substantial distance of the project area to known CRF occurrences in the region, the poor quality of the backwash/balancing basin habitats and surrounding upland habitat, and the manner in which the basins are operated as part of the recycled water operation, makes it highly unlikely that these basins are occupied by CRF. Due to the dense nature of the cattails and blackberry in and adjacent to these ponds, visual encounter surveys would likely not result in detection even if the species was present.

In summary, the backwash/balancing basins and three seasonal wetlands and associated upland habitats do not appear to provide suitable breeding or upland habitat for CRF. As a result, it is highly unlikely that CRF occur within these basins, the three seasonal wetlands, or within other aquatic habitats adjacent to the project area.

If you have any questions regarding this report, please contact me via telephone at 530.217.8952 or email at cseltenrich@dudek.com.

Sincerely,

Craig Seltenrich
Senior Aquatic Ecologist

Att. Figures 1–8
Appendix A: CRF Habitat Assessment Qualifications
Appendix B: Representative Site Photos
Appendix C: Completed Field Data Sheet

REFERENCES CITED

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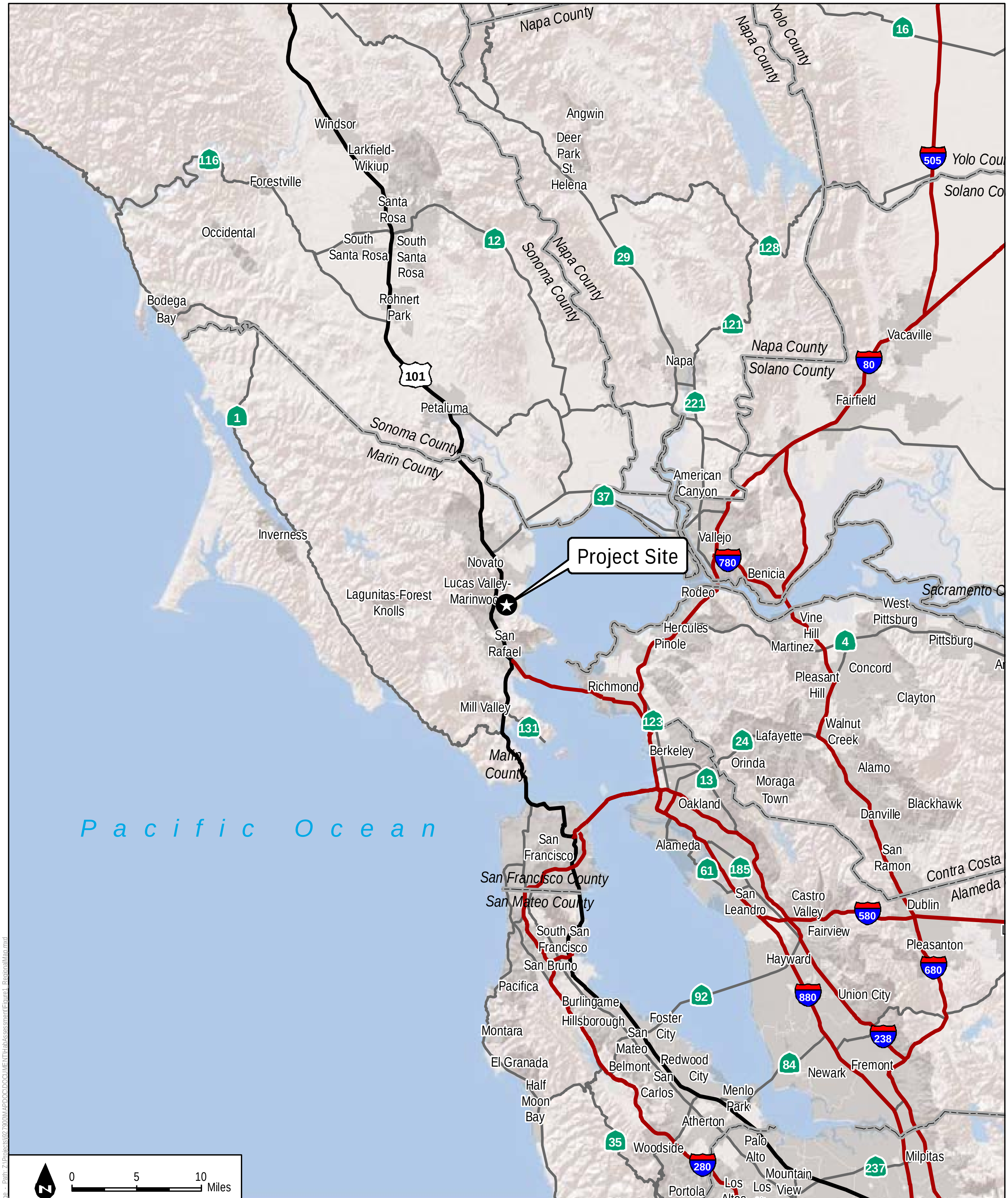

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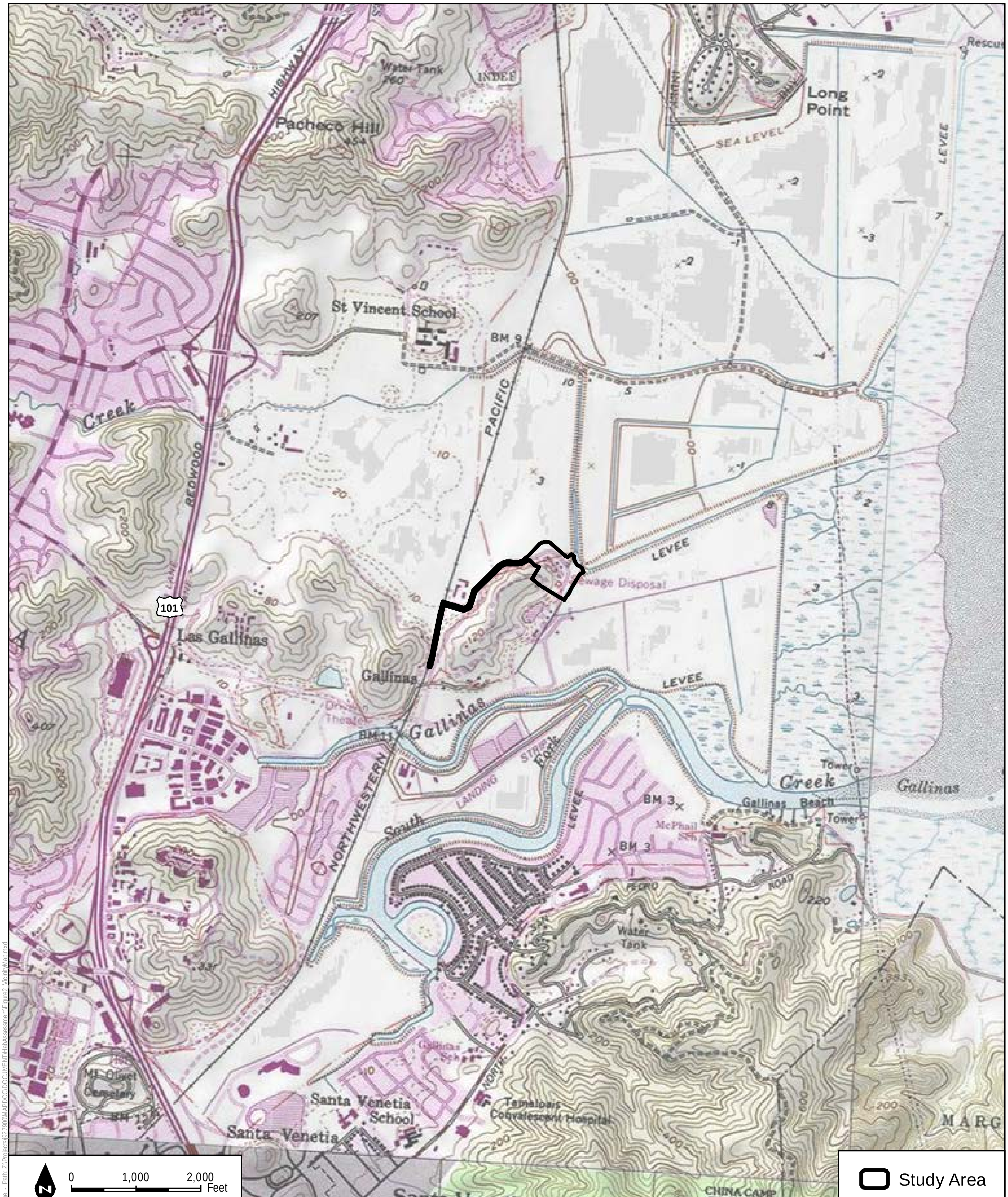
FIGURE 1

Regional Map

Las Gallinas Valley Project CRF Habitat Assessment

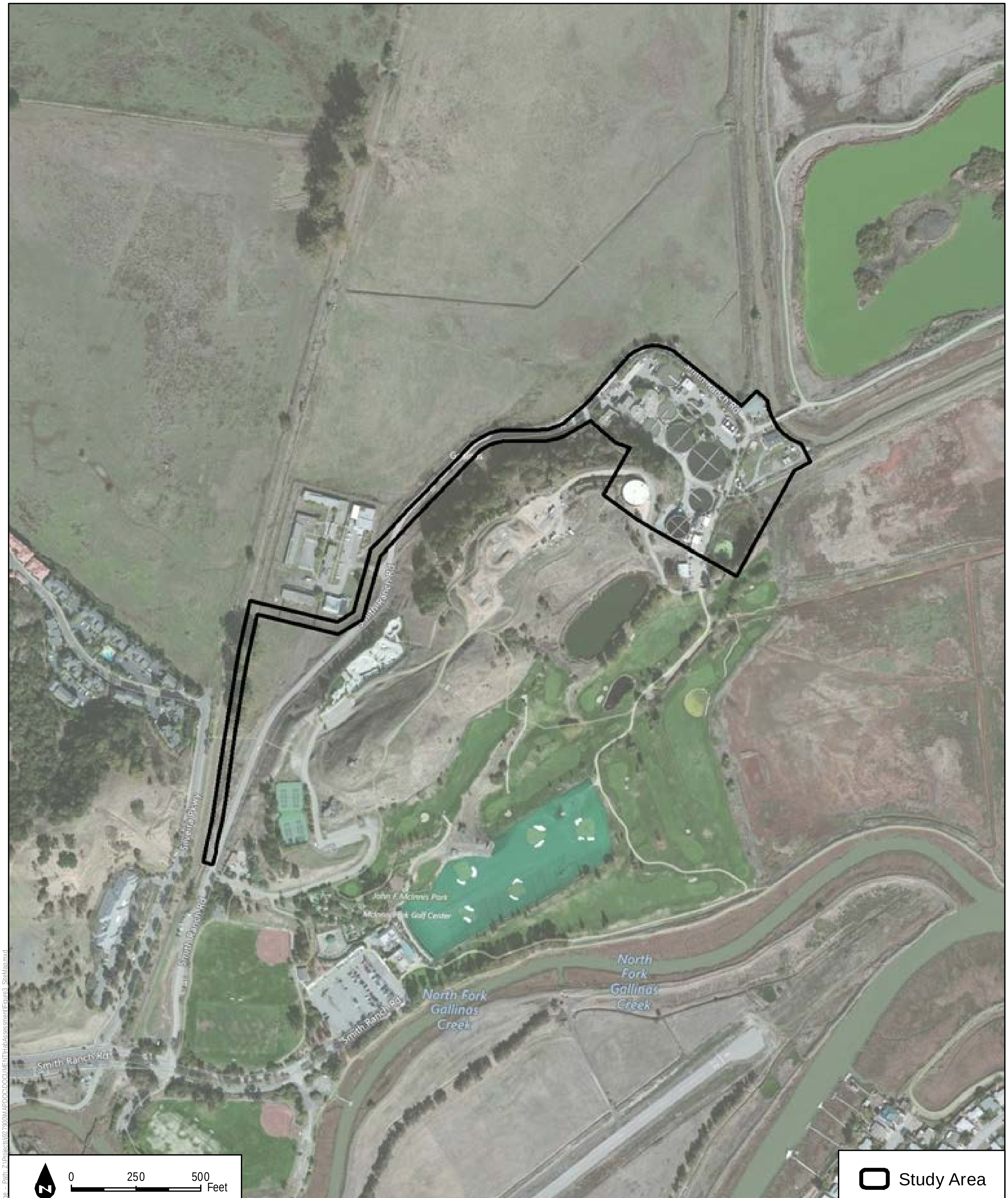


SOURCE: USGS 7.5-Minute Series Novato Quadrangle

FIGURE 2

Vicinity Map

Las Gallinas Valley Project CRF Habitat Assessment



SOURCE: Bing Maps (Accessed 2016)

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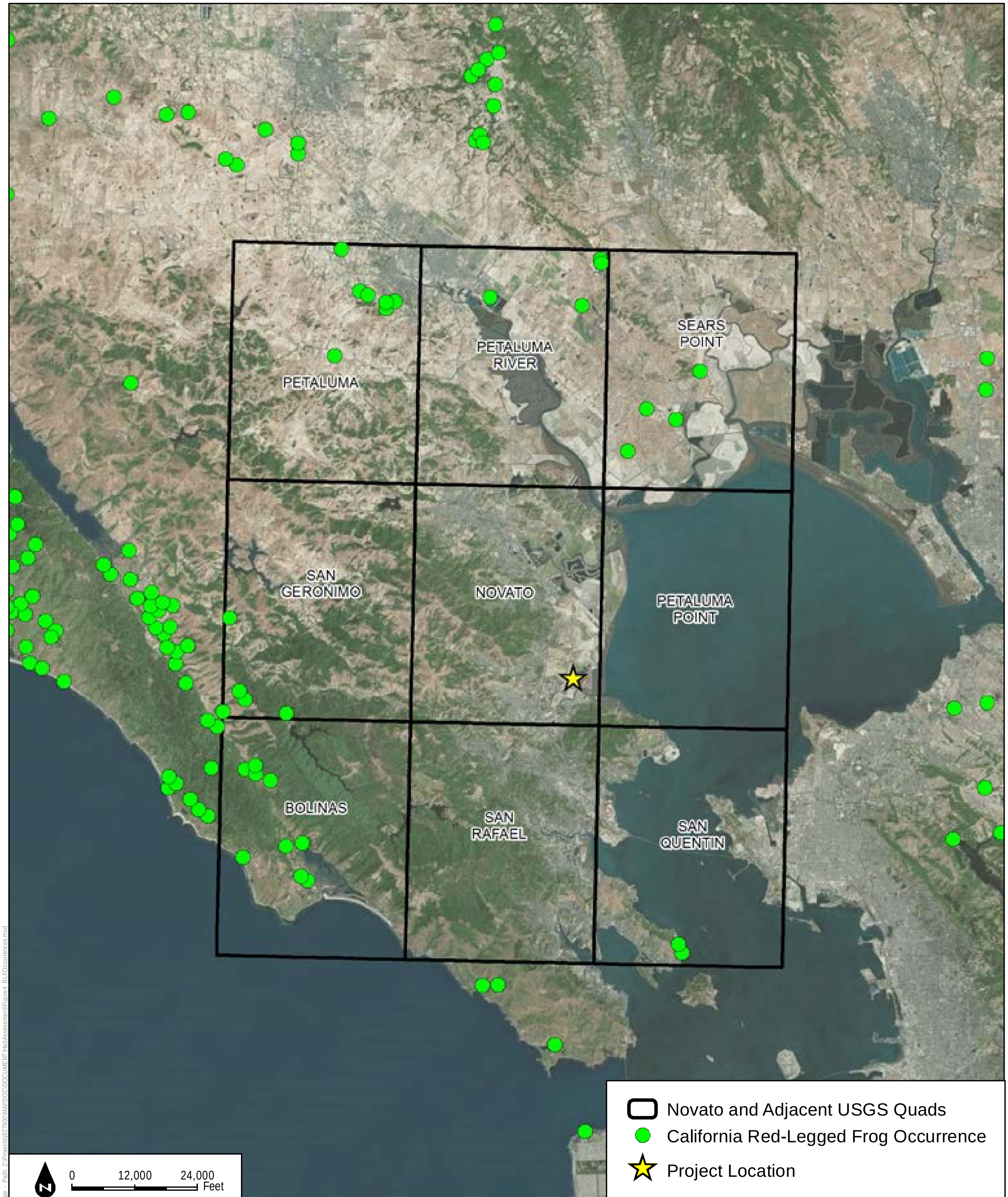
FIGURE 3

Site Map

Las Gallinas Valley Project CRF Habitat Assessment



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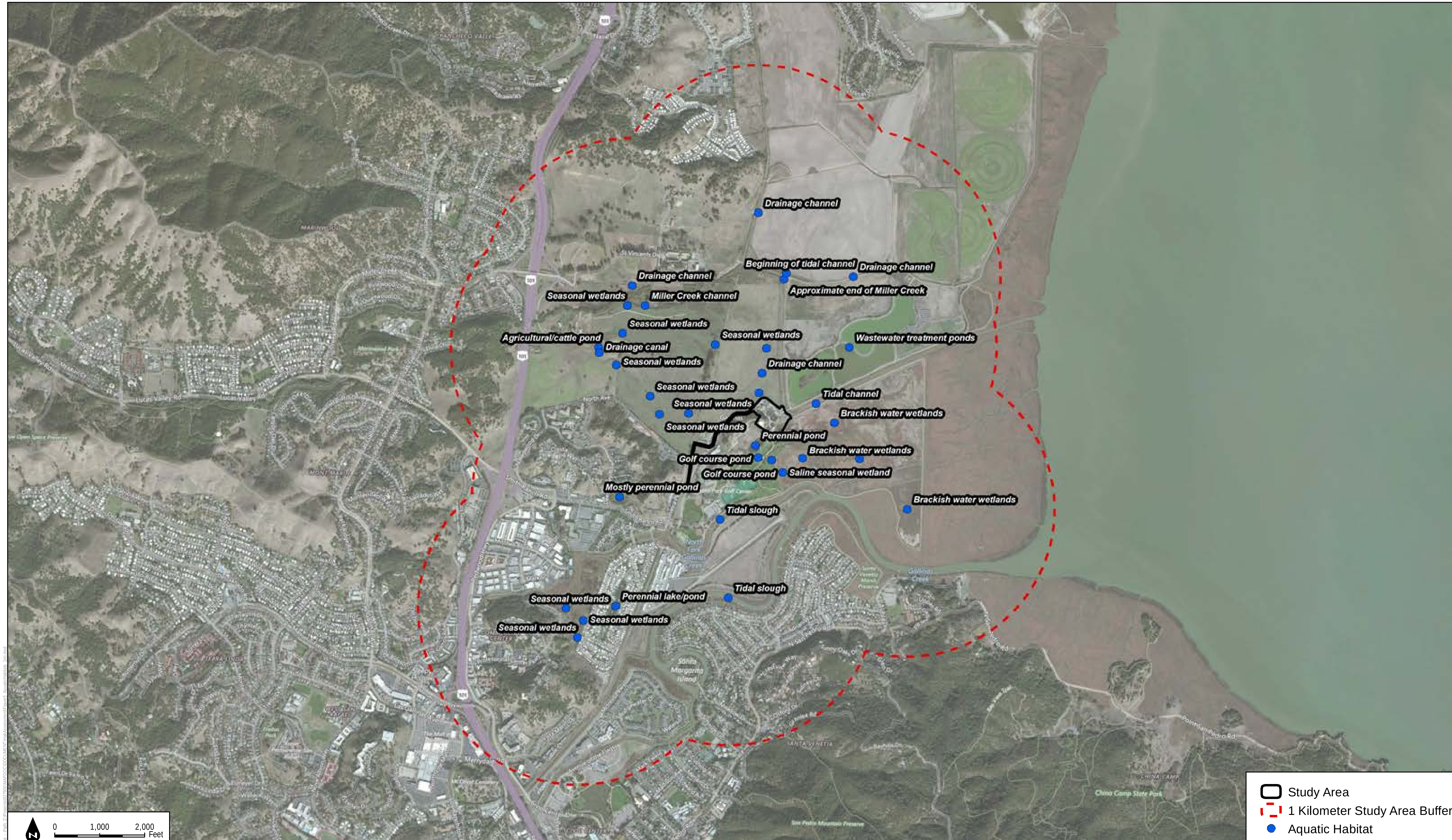
SOURCE: Bing Maps (Accessed 2016) CNDDB (2015)

Figure 4

California Red-Legged Frog Occurrence Records

Las Gallinas Valley Project CRF Habitat Assessment



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SOURCE: Bing Maps (Accessed 2016)

FIGURE 5

Aquatic Habitats Within 1-Kilometer of the Project Area

Las Gallinas Valley Project CRF Habitat Assessment

SOURCE: Bing Maps (Accessed 2016)

FIGURE 6

California Red-Legged Frog Habitat Assessment Survey Area

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Las Gallinas Valley Project CRF Habitat Assessment

SOURCE: SOURCE: Bing Maps (Accessed 2016)

DUDEK

FIGURE 7

Potentially Jurisdictional Features and Vegetation Communities

Las Gallinas Valley Project CRF Habitat Assessment

SOURCE: SOURCE: Bing Maps (Accessed 2016)

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FIGURE 8

Location of Aquatic Habitats Within the Project Area

Las Gallinas Valley Project CRF Habitat Assessment

APPENDIX A

CRF Habitat Assessment Qualifications

Statement of Qualifications

Craig Seltenrich, M.S.
Senior Aquatic Ecologist

Craig Seltenrich has 37 years of experience in the field of aquatic biology, including; amphibian ecology, aquatic toxicology, and freshwater and marine fisheries. Since 1999, he has specialized in amphibian ecology and has designed and conducted numerous studies for evaluating potential impacts on special-status amphibians throughout much of the western Sierras and in other areas of central and northern California. Mr. Seltenrich worked at Pacific Gas and Electric Company for 23 years and was the principle amphibian biologist for all Company projects. He has also written several survey protocols for native Ranids in California including the foothill yellow-legged frog, Sierra Nevada yellow-legged frog, Yosemite toad, Cascades frog, and northern leopard frog.

Mr. Seltenrich has extensive experience conducting habitat assessments and surveys for the California red-legged frog (CRF) throughout much of central and northern California, as well as collection and handling of larvae and adults. He has conducted extensive surveys in the Altamont Pass area, along the southern flanks of Mount Diablo, in the Monterey Bay area, in the Central Valley, and in several locations in the Sierra foothills, and has documented numerous new CRF breeding locations. During these surveys, Mr. Seltenrich has observed breeding, egg masses, larvae, juveniles, and adults; and has documented numerous new populations in the San Francisco Bay area. He also conducted several CRF population assessments/surveys at the Big Gun Conservation Bank in Michigan Bluff, which is the largest population in the Sierra foothills.

In addition, he has participated in CRF workshops and training sessions and has conducted CRF training workshops at the Big Gun Conservation Bank in Michigan Bluff for the last three years. Mr. Seltenrich currently possesses a 10(A)(1)(a) permit for both CRF and the California tiger salamander. Mr. Seltenrich has also prepared Biological Assessments for CRF, and has designed innovative approaches for minimizing impacts and conserving this species.

<u>Publications</u>

Pacific Gas & Electric Company. 2001. "Survey Protocols for Mountain Yellow-Legged Frog, Northern Leopard Frog, Cascades Frog, and Yosemite Toad: Standard Operating Procedures and Data Sheets for Amphibian Surveys and Habitat Assessments." Prepared by C. Seltenrich and A. Pool. May 2001.

Seltenrich, C.P., and A.C. Pool. 2002. "A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog (*Rana boylii*)." Pacific Gas & Electric Company.

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APPENDIX B

Representative Site Photos

ATTACHMENT B
Las Gallinas (December 2015):
Representative Photographs

1. Looking easterly across Backwash/Balancing Pond A

2. Looking northerly across Backwash/Balancing Pond B

3. Looking northeasterly across Backwash/Balancing Pond A

4. Looking northerly across Backwash/Balancing Pond B

5. Looking southwesterly across Backwash/Balancing Ponds A and B

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APPENDIX C

Completed Field Data Sheet

California Red-Legged Frog Habitat Assessment Form[1]

General Information Marin County			
Project Name / County: Las Gallinas Valley Sanitary District		Observers: C Settenrich	
Date: 12-9-15	Site Number: Secondary Treatment Upgrade	Site Elevation: 10' - 125'	
Additional Info:			

Aquatic Habitat			
Pond 2 Lake (A + B)	Natural / Man-made	Ephemeral / Perennial → controlled inflow	
Stream	Ephemeral / Intermittent	Perennial	
	Pools No Pools	Size:	Depth:
	% Riffles:	Stream Gradient: Low Moderate High	
Pools (along stream)	Ephemeral / Intermittent	Size:	Depth:
Other (describe): Pond A - eastern pond, Pond B - western pond			

Aquatic Features			
Water: Present A Absent B	If Present, % Inundation: A 3% / B 0%	Turbidity: Low (clear) Moderate High	
Size (meters) A and B	Width: A-110' B-90'	Length: A-110', B-100'	
Depth (meters)	Maximum: A-10', B-10'	Minimum: flat bottom 0	Average: unk.
Est. Flow (CuFt/sec): —			
Shade on water (mid-day)	0 % cattail shade	Type: Canopy Around margin Floating	
Emergent Vegetation	% Cover: 100'	Type: cattails, Himalayan blackberry	
Submerged Vegetation	% Cover: 0	Type:	
Basking Sites	Present Absent	Type: pond berm	Abundance: L M H
Substrate (%) ↓	Fines ___ Sand ___	Gravel ___ Cobble ___	Boulder ___ Bedrock ___
Comments: → bottom substrates not visible through dense cattail rhyzomes			

Shoreline Features		
Overhanging Vegetation	% Cover: 30	Type: Himalayan blakkberry
Earthen Banks	Present Absent	Extent: < 2%
Undercut Banks	Present Absent	Extent:
Rootballs	Present Absent	Abundance: Low Moderate High
Bank Gradient	Range (degrees): 75	Low Moderate High
Evidence of Disturbance	Yes No	Low Moderate High
Type of Disturbance	Livestock Trampling Erosion	Mining Other:
Comments: Banks w/ dense blackberry and cattails, Eucalyptus and cottonwood around west, south, and east sides		

Terrestrial Habitat and Features			
General Habitat Description:	Pond choked with cattails and blackberry, no open water		
Barriers to Movement / Dispersal	Present Absent	Type:	Location:
Cover (within 50 ft of site)	% Cover: 95%	Type: blackberry, leaf litter	
Burrows / Cover Objects:	Present Absent	Type:	Abundance:
Project Site Land Use:	wastewater treatment		
Adjacent Land Use:	Golf Park, Helen Vine Detox center, walking trails, and diked baylands		
Comments: Eucalyptus and cottonwood around margin - except north side			

Wildlife Observed —	
Amphibians:	Fish:
Reptiles:	Other:
Comments:	

Photo #	Description	Photo #	Description

[1] Based on habitat requirements in *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005).

APPENDIX C: CULTURAL RESOURCES REPORT

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.885.8372

March 10, 2016

Ms. Stephanie Standerfer
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

Subject: ***Cultural Resources Report for the Proposed Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project, Marin County, California***

Dear Ms. Standerfer:

This letter documents the results of a cultural resources inventory conducted by Dudek for the proposed Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project (project). It is our understanding that the Las Gallinas Valley Sanitary District (District) intends to improve their wastewater treatment plant to increase its treatment capacity. The District is the lead agency for compliance with the California Environmental Quality Act (CEQA). The current inventory included a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) Sacred Lands File search, tribal information outreach, and an intensive pedestrian survey of the project site. The treatment plant site is an identified historical-era resource, however previous evaluation has resulted in the determination that the facility is not a significant resource under CEQA or the National Historic Preservation Act. No additional archaeological or built-environment resources were identified in the project footprint. Based on the negative results of this inventory, the project will not present a significant impact to cultural resources. As such, no additional cultural work is recommended prior to project implementation.

PROJECT DESCRIPTION AND LOCATION

The project is located in Sections 9 and 16 of Township 2 North Range 6 West in the USGS Novato 7.5’ quadrangle. Figures 1 and 2 show the regional location and project site location, respectively. The Las Gallinas Valley Sanitary District is proposing numerous additions and improvements to their current wastewater treatment plant including infrastructure improvements and additional secondary clarifiers, as well as upgrades to the current clarifiers. The project includes 2,600 feet of new piping as part of the replacement of an existing force main, outside of the treatment plant footprint, along Smith Ranch Road. The new force main will replace the existing force main in the same alignment. The location of the existing force main follows Smith Ranch Road for approximately 1,400 feet, extends west until reaching the existing railroad tracks and then follows the east side of the tracks to the southern extent of the APE. Elevations in the APE range from approximately 15 to 40 feet above mean sea level (amsl) and has a hilly terrain.

REGULATORY FRAMEWORK

The California Register of Historical Resources (PRC section 5020 et seq.)

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." (PRC section 5020.1(j).) In 1992, the California legislature established the CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." (PRC section 5024.1(a).) The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the National Register of Historic Places (NRHP), enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) 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.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than fifty years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see Cal. Code Regs., tit. 14, section 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described further below, the following California Environmental Quality Act (CEQA) statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC section 21083.2(g) defines "unique archaeological resource."
- PRC section 21084.1 and CEQA Guidelines section 15064.5(a) defines "historical resources." In addition, CEQA Guidelines section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource;" it also defines the circumstances when a project would materially impair the significance of an historical resource.
- PRC section 21074(a) defines "tribal cultural resources."
- PRC section 5097.98 and CEQA Guidelines section 15064.5(e): Set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC sections 21083.2(b)-(c) and CEQA Guidelines section 15126.4: Provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource." (PRC section 21084.1; CEQA Guidelines section 15064.5(b).) If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA. (PRC section 21084.1; CEQA Guidelines section 15064.5(a).) The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption. (PRC section 21084.1; CEQA Guidelines section 15064.5(a).)

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." (CEQA Guidelines section 15064.5(b)(1); PR Code section 5020.1(q).) In turn, the significance of an historical resource is materially impaired when a project:

(1) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or

(2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

(3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

(CEQA Guidelines section 15064.5(b)(2).) Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (Section 21083.2[a], [b], and [c]).

Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (PRC section 21083.2(a); CEQA Guidelines section 15064.5(c)(4).) However, if a non-unique archaeological resource qualifies as tribal cultural resource (PRC 21074(c); 21083.2(h)), further consideration of significant impacts is required.

CEQA Guidelines section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in PRC section 5097.98.

Native American Historic Cultural Sites (PRC section 5097 et seq.)

State law addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the Heritage Commission to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy an Indian historic or cultural site that is listed or may be eligible for listing in the CRHR.

California Health and Safety Code section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. Health and Safety Code section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the County coroner has examined the remains (section 7050.5b). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the California Native American Heritage Commission (NAHC) within 24 hours (section 7050.5c). The NAHC will notify the Most Likely Descendant. With the permission of the landowner, the Most Likely

Descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the Most Likely Descendant by the NAHC. The Most Likely Descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

METHODS

This cultural resource investigation consisted of a records search of the project area and a 0.5 mile radius around the project area at the NWIC, a search of the Sacred Lands File at the NAHC, and an intensive pedestrian survey of the project area.

Records Search

The records search was requested by Dudek archaeologist Scott Wolf on January 1, 2016 at the NWIC and responded to by the NWIC on January 22, 2016. The records search included examination of historic resource location maps, historic maps, and a review of previous studies performed in the area. The records search identified one cultural resource within the project's APE, one cultural resource within 0.5 miles of the project's APE, four previous cultural resource studies conducted within the project's APE, and ten previous studies that have been performed within 0.5 mile of the project area (Confidential Appendix A).

The records search identified one previously known cultural resource within the project's APE, the Las Gallinas Wastewater Treatment Plant itself (P-21-002672). The plant was erected 1954 indicating it is historic in age. However, the plant has undergone many renovations since its original construction and possesses no historically unique characteristics. Based on these observations, the plant was determined ineligible for the NRHP or CRHR in 2009. One previously known cultural resource was also identified within 0.5 mile of the APE. Railroad tracks for the Northwestern Pacific Railroad (P-21-002618) are adjacent to the force main replacement portion of the APE, directly to the west. The present alignment for the tracks was set in 1912-1913. The current tracks were upgraded in 1970s. Numerous other upgrades have substantially compromised the integrity of this resource as a whole and it was recommended to be ineligible for the NRHP and CRHR listing in 2008.

NAHC and Native American Correspondence

A Sacred Lands File search request was requested from the NAHC on January 20, 2016 by Dudek archaeologist Scott Wolf. The NAHC's response on February 18, 2016 failed to identify any Native American cultural resources within the project's APE. The NAHC also provided a Contact List of Native American representatives that may have additional information relating to cultural resources in the vicinity. Letters containing a brief project description and location were sent on March 1, 2016 to these individuals with a request for any additional information that might be provided. No responses to these outreach attempts have been received from tribal representatives to date.

Intensive Pedestrian Survey

An intensive pedestrian survey was performed by William Burns on January 21, 2016. All fieldwork was performed using standard archaeological procedures and techniques that meet the Secretary of Interior's Standards and Guidelines for cultural resources inventory and evaluation. The entire APE was surveyed on foot to look for surface artifacts, undisturbed areas, or historic structures. Subsurface exposures and rodent burrows were opportunistically inspected for indications of soils with the potential to contain archaeological deposits. A series of overview photographs were taken to document the current condition and previous disturbances to the section as well as to document the existing structures on the site.

The majority of areas throughout the APE were noted to have been subject to substantial disturbances related to construction of the wastewater treatment plant. This construction appears to have included cut-and-fill, trenching, pad preparation, and general grading activities. Office buildings, maintenance garages, and other facility structures are present in the western portion of the APE, and much of the remaining area is devoted to clarifying pools, parking areas, and landscaping. It appears that limited intact subsurface native soils remain.

The alignment of the proposed force main upgrade extends from the southwest entrance of the treatment plant and follows Smith Ranch Road south for approximately 1,400 feet. The road here has been cut out of the hillside, stabilized, and paved over. The alignment then extends west to the train tracks and turns south and follows the eastern side of the train tracks under a bed of fill to the southern boundary of the project area. All areas along the alignment of the force main replacement show high levels of ground disturbance. No artifacts or cultural resources were encountered during the pedestrian survey.

SUMMARY AND MANAGEMENT CONSIDERATIONS

The records search identified one previously recorded historical-era resource within the APE, the Las Gallinas Valley Wastewater Treatment Plant (P-21-002672), which was previously determined ineligible for NRHP or CRHR listing. As such, modifications to the plant will not represent a significant impact under CEQA. No prehistoric resources have been identified in the APE or surrounding records search area. No additional cultural resources were identified during the intensive pedestrian survey. A NAHC Sacred lands File search failed to identify any Native American Resources. No responses to Native American outreach attempts have been received to date. With the exception of a lagoon in the eastern portion of the APE and the extreme slope in the southern portion of the plant, all areas within the APE show signs of significant ground disturbance.

In consideration of this information, Dudek does not expect that any cultural resources would be encountered during ground-disturbing construction activities. No cultural monitoring appears to be necessary. In the event cultural resources are inadvertently found by onsite personnel during construction, all ground disturbing activities should stop and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology should be retained to evaluate the discovered resources and recommend appropriate action.

PRC Section 5097.98 outlines the process to be followed in the event that human remains are discovered. If human remains of prehistoric origin are discovered, California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains can occur until the County Coroner has examined the remains (Section 7050.5b).

If you have any questions regarding the findings of this report please contact Dudek archaeologist Adam Giacinto at agiacinto@dudek.com.

Respectfully Submitted,

William Burns, MSc, RPA
Archaeologist

cc: Adam Giacinto, Dudek
Sean O'Brien, Dudek

Att: Figure 1. Regional Map
Figure 2. Vicinity Map
National Archaeological Database Information Sheet
Confidential Appendix A –: NWIC Records Search Results
Appendix B:NAHC and Tribal Correspondence

NATIONAL ARCHAEOLOGICAL DATABASE (NADB) INFORMATION

Authors: William Burns, MSc, RPA and Adam Giacinto, MA, RPA

Firm: Dudek

Project Proponent: Las Gallinas Valley Sanitary District

Report Date: March, 2016

Report Title: Negative Cultural Resources Letter Report for the Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project, Marin County, California

Type of Study: Archaeological Inventory, Intensive Pedestrian Survey

Resources: P-21-002672

USGS Quads: Novato

Area: 2600 linear feet

Keywords: Intensive Pedestrian Survey, Negative, Wastewater Treatment Plant

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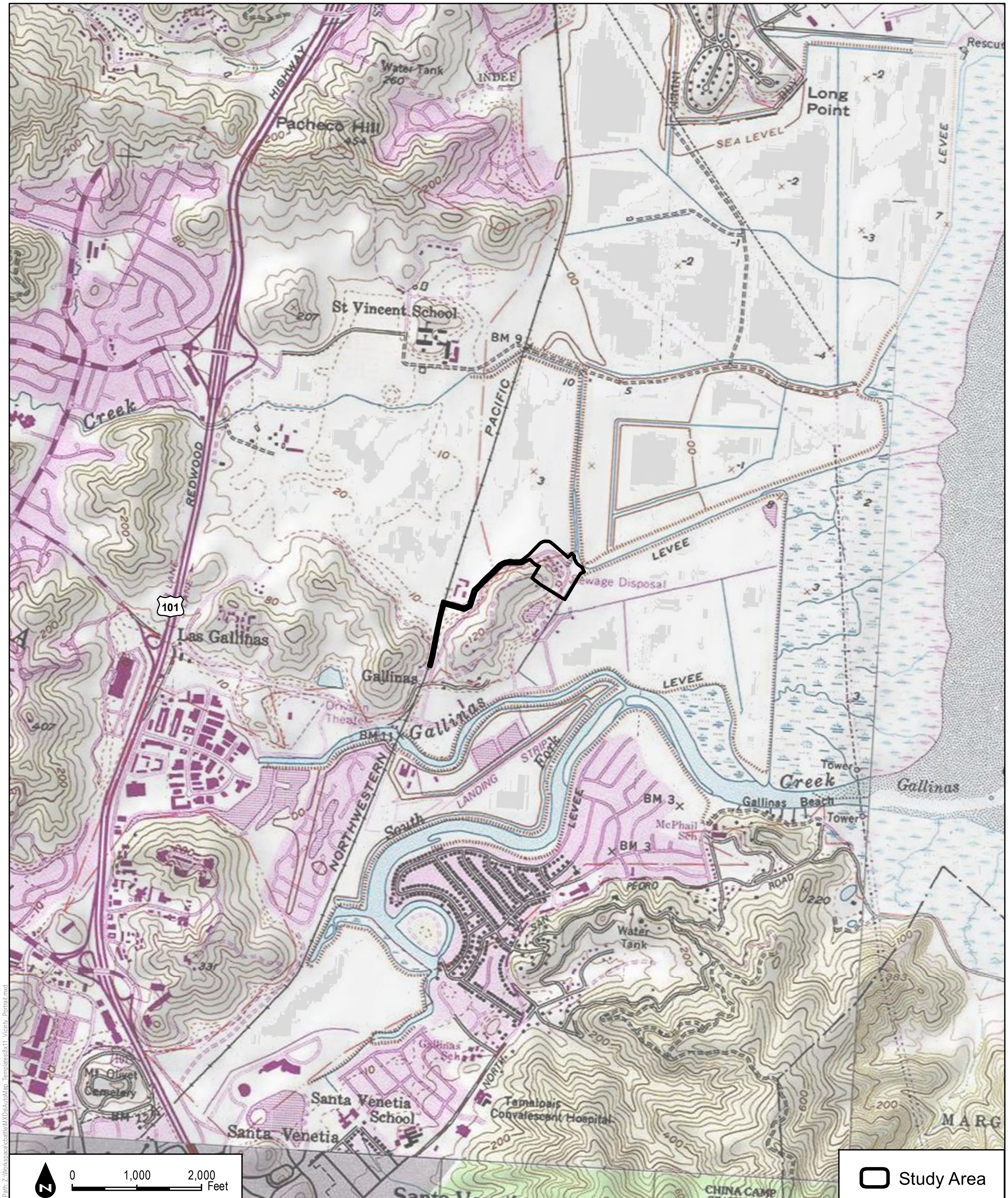
FIGURE 1
Regional Map

Las Gallinas Valley Sanitary District



SOURCE: USGS 7.5-Minute Series Novato Quadrangle

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FIGURE 2
Vicinity Map

Las Gallinas Valley Sanitary District

APPENDIX A

Confidential Records Search

APPENDIX B

NAHC and Tribal Correspondence

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 20, 2016

Katy Sanchez
Associate Government Program Analyst
Native American Heritage Commission

Subject: ***NAHC Sacred Lands Records Search Request for the Las Gallinas Valley Sanitary District in San Rafael, Marin County, California***

Dear Ms. Sanchez,

Dudek is conducting a cultural resources survey project for the Las Gallinas Valley Sanitary District. The approximately 7.4-acre project site is located in San Rafael, California at 300 Smith Ranch Road (Figure 1). The project site is located approximately one mile east of U.S. Highway 101 and one mile west of the west shore of San Pablo Bay. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5' quadrangle.

Dudek is requesting a NAHC search for any sacred sites, traditional cultural properties, or other Native American cultural resources that may fall within a one-mile buffer of the proposed project location (Figure 1). Please provide contact information for all Native American tribal representatives that should be consulted regarding these project activities. This information can be faxed to 760-632-0164.

If you have any questions about this investigation, please contact me directly by email or phone.

Regards,

Scott Wolf
Archaeologist
DUDEK
Phone: (760) 479-3814
Cell: (858) 775-9028
Email: swolf@dudek.com

Attachments:
Figure1. Project location map.

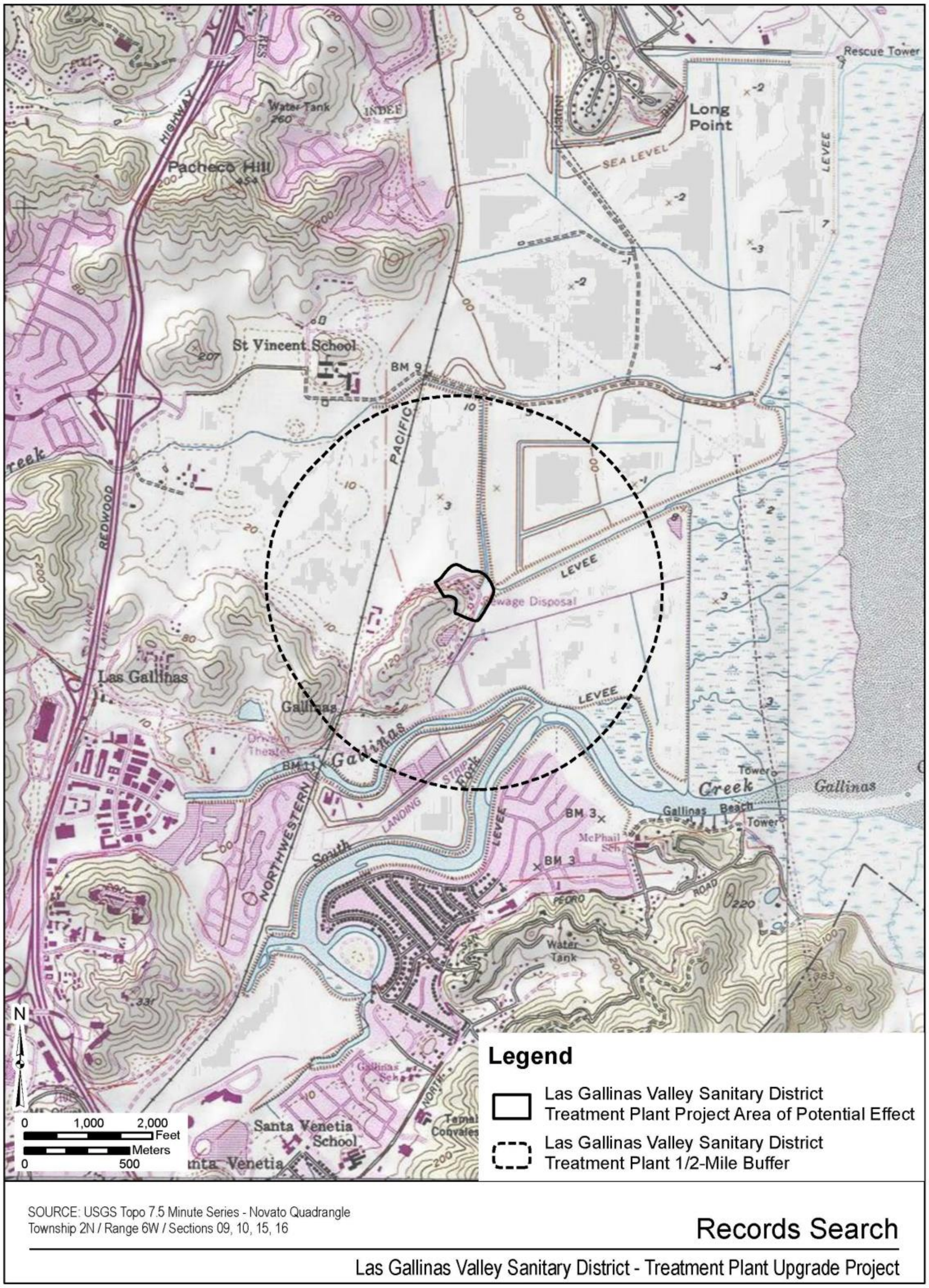

Figure 1. Project location map

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

February 18, 2016

Scott Wolf
Dudek
605 Third Street
Encinitas, CA 92024

Email to: swolf@dudek.com

Re: Las Gallinas Valley Sanitary District

Dear Mr. Wolf,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at Joshua.standinghorse@nahc.ca.gov.

Sincerely,

Joshua Standing Horse
Associate Governmental Program Analyst

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.885.8372

March 1, 2016

Mr. Gene Buvelot,
The Federated Indians of Graton Rancheria
6400 Redwood Dr. #300
Rohnert Park, CA 94928

Subject: ***Information Request for the Las Gallinas Sanitary District Project, Marin County, California***

Dear Mr. Buvelot,

Las Gallinas Sanitary District is proposing improvements to their existing facilities in San Rafeal, California (Figure 1). The area is bounded by Smith Ranch Rd to the north and McInnis Park Golf Club to the south. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5' quadrangle.

The Native American Heritage Commission conducted a Sacred Lands file search. No Native American cultural resources were identified within a one-half mile distance of the proposed project area. Intensive pedestrian survey and a NWIC records search also did not identify any Native American archaeological within the project boundaries or the surrounding records search area. I am writing to inquire if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project.

If you have any information or concerns pertaining to such information, please contact me by phone or email.

Respectfully,

Adam Giacinto, M.A., RPA
Archaeologist
DUDEK
Phone: (760) 479-4252
Cell: (760) 846-5755
Email: agiacinto@dudek.com

Attachments: *Figure 1. Project location map*

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.885.8372

March 1, 2016

Mr. Greg Sarris, Chairperson
The Federated Indians of Graton Rancheria
6400 Redwood Dr. #300
Rohnert Park, CA 94928

Subject: Information Request for the Las Gallinas Sanitary District Project, Marin County, California

Dear Mr. Sarris,

Las Gallinas Sanitary District is proposing improvements to their existing facilities in San Rafeal, California (Figure 1). The area is bounded by Smith Ranch Rd to the north and McInnis Park Golf Club to the south. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5' quadrangle.

The Native American Heritage Commission conducted a Sacred Lands file search. No Native American cultural resources were identified within a one-half mile distance of the proposed project area. Intensive pedestrian survey and a NWIC records search also did not identify any Native American archaeological within the project boundaries or the surrounding records search area. I am writing to inquire if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project.

If you have any information or concerns pertaining to such information, please contact me by phone or email.

Respectfully,

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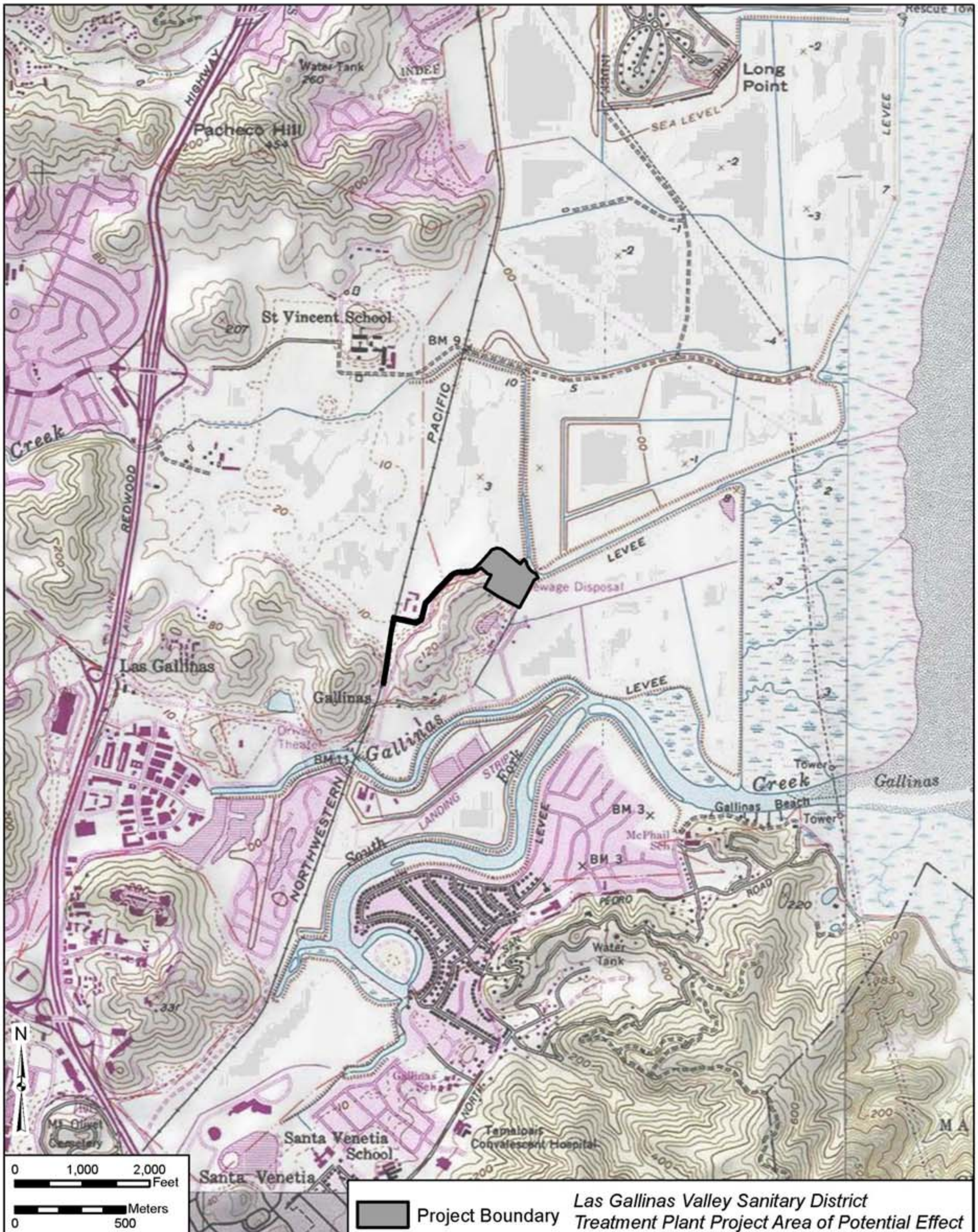
Attachments: *Figure 1. Project location map*



SOURCE: USGS Topo 7.5 Minute Series - Novato Quadrangle
Township 2N / Range 6W / Sections 09, 10, 15, 16

Information Request Map

Las Gallinas Valley Sanitary District - Treatment Plant Upgrade Project

APPENDIX B

Cultural Resources Report for the Proposed Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project, Marin County, California

DUDEK

1630 SAN PABLO AVENUE, SUITE 300
OAKLAND, CALIFORNIA 94612
T 510.601.2500 F 510.601.2501

June 22, 2018

Ms. Stephanie Standerfer
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

Subject: ***Cultural Resources Report for the Proposed Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project, Marin County, California***

Dear Ms. Standerfer:

This letter documents the results of a cultural resources inventory conducted by Dudek for the proposed Las Gallinas Valley Sanitary District Secondary Treatment Upgrade Project (project). It is our understanding that the Las Gallinas Valley Sanitary District (District) intends to improve their wastewater treatment plant to increase its treatment capacity. The District is the lead agency for compliance with the California Environmental Quality Act (CEQA). The lead agency for compliance with Section 106 of the National Historic Preservation act (NHPA) is the State Water Resources Control Board (SWRCB). Cultural resources inventory efforts included a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) Sacred Lands File search, tribal information outreach, and an intensive-level pedestrian survey of the project site. The treatment plant site is an identified historical-era resource, however previous evaluation has resulted in the determination that the facility is not a significant resource under CEQA or the NHPA. No additional archaeological or built-environment resources were identified in the project footprint. One additional resource, the Northwestern Pacific Railroad, was identified within 0.5 miles of the project area but lies outside of the Area of Potential Effect (APE) and will not be affected by current project designs. Based on the negative results of this inventory, the project will not present a significant impact to cultural resources. As such, no additional cultural work is recommended prior to, or concurrently with, project implementation.

PROJECT DESCRIPTION AND LOCATION

The project is located in Sections 9 and 16 of Township 2 North Range 6 West in the USGS Novato 7.5' quadrangle. Figures 1 and 2 show the regional location and project site location, respectively.

Elevations in the range from approximately 15 to 40 feet above mean sea level (amsl) and has a hilly terrain. The Las Gallinas Valley Sanitary District is proposing numerous additions and improvements to their current wastewater treatment plant including infrastructure improvements and additional secondary clarifiers, as well as upgrades to the current clarifiers. The project includes 2,600 feet of new piping as part of the replacement of an existing force main, outside of the treatment plant footprint, along Smith Ranch Road. The new force main will replace the existing force main in the same alignment. The location of the existing force main follows Smith Ranch Road for approximately 1,400 feet, extends west until reaching the existing railroad tracks and then follows the east side of the tracks to the southern extent of the APE. The APE for the project is considered to include all areas potentially subject to direct disturbances, including improvements to treatment facility area, temporary staging areas, and areas within and adjacent to proposed pipelines (Figure 3). The APE includes the improvements to the treatment plant itself, approximately 750 feet by 350 feet, as well as a 40 foot wide pipeline corridor provided within project plans. The vertical APE, defined by the maximum depth of potential subsurface disturbance, is understood for the purposes of providing management recommendations to be no more than 40 feet below the existing ground surface. Most subsurface disturbances along the linear portions of the APE will be less than 10 feet in depth, however pilings are required to be driven at least 10 feet into the bedrock that underlies soils in the area.

REGULATORY FRAMEWORK

The current cultural resources investigation was completed to satisfy local, CEQA and Section 106 of NHPA.

National Historic Preservation Act (NHPA)

The National Register of Historic Places (NRHP) is the United States' official list of districts, sites, buildings, structures, and objects worthy of preservation. Overseen by the National Park Service (NPS), under the U.S. Department of the Interior, the NRHP was authorized under the NHPA, as amended. Its listings encompass all National Historic Landmarks, as well as historic areas administered by NPS.

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize the accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the NRHP, which are outlined in 36 CFR 60.4. For a property to be listed in or determined eligible for listing, it must be demonstrated to possess integrity and to meet at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

Integrity is defined in NRHP guidance, *How to Apply the National Register Criteria,* as "the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity" (NPS 1990). NRHP guidance further asserts that properties be completed at least 50 years ago to be considered for eligibility. Properties completed fewer than 50 years before evaluation must be proven to be "exceptionally important" (criteria consideration G) to be considered for listing.

A historic property is defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria" (36 CFR Sections 800.16(i)(1)).

Effects on historic properties under Section 106 of the NHPA are defined in the assessment of adverse effects in 36 CFR Sections 800.5(a)(1):

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse

effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Adverse effects on historic properties are clearly defined and include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contributes to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR 800.5 (2)).

To comply with Section 106, the criteria of adverse effect are applied to historic properties, if any exist in the Project Area of Potential Effect (APE), pursuant to 36 CFR Sections 800.5(a)(1). If no historic properties are identified in the APE, a finding of "no historic properties affected" will be made for the proposed Project. If there are historic properties in the APE, application of the criteria of adverse effect will result in Project-related findings of either "no adverse effect" or of "adverse effect," as described above. A finding of no adverse effect may be appropriate when the undertaking's effects do not meet the thresholds in criteria of adverse effect 36 CFR Sections 800.5(a)(1), in certain cases when the undertaking is modified to avoid or lessen effects, or if conditions were imposed to ensure review of rehabilitation plans for conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (codified in 36 CFR Part 68).

If adverse effects findings were expected to result from the proposed Project, mitigation would be required, as feasible, and resolution of those adverse effects by consultation may occur to avoid, minimize, or mitigate adverse effects on historic properties pursuant to 36 CFR Part 800.6(a).

The California Register of Historical Resources (PRC section 5020 et seq.)

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." (PRC section 5020.1(j).) In 1992, the California legislature established the CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." (PRC section 5024.1(a).) The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the National Register of Historic Places (NRHP), enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) 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.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than fifty years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see Cal. Code Regs., tit. 14, section 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described further below, the following California Environmental Quality Act (CEQA) statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC section 21083.2(g) defines "unique archaeological resource."
- PRC section 21084.1 and CEQA Guidelines section 15064.5(a) defines "historical resources." In addition, CEQA Guidelines section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource;" it also defines the circumstances when a project would materially impair the significance of an historical resource.
- PRC section 21074(a) defines "tribal cultural resources."
- PRC section 5097.98 and CEQA Guidelines section 15064.5(e): Set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC sections 21083.2(b)-(c) and CEQA Guidelines section 15126.4: Provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource." (PRC section 21084.1; CEQA Guidelines section 15064.5(b).) If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA. (PRC section 21084.1; CEQA Guidelines section 15064.5(a).) The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption. (PRC section 21084.1; CEQA Guidelines section 15064.5(a).)

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." (CEQA Guidelines section 15064.5(b)(1); PR Code section 5020.1(q).) In turn, the significance of an historical resource is materially impaired when a project:

(1) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or

(2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

(3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

(CEQA Guidelines section 15064.5(b)(2).) Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (Section 21083.2[a], [b], and [c]).

Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (PRC section 21083.2(a); CEQA Guidelines section 15064.5(c)(4).) However, if a non-unique archaeological resource qualifies as tribal cultural resource (PRC 21074(c); 21083.2(h)), further consideration of significant impacts is required.

CEQA Guidelines section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in PRC section 5097.98.

Native American Historic Cultural Sites (PRC section 5097 et seq.)

State law addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the Heritage Commission to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy an Indian historic or cultural site that is listed or may be eligible for listing in the CRHR.

California Health and Safety Code section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. Health and Safety Code section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the County coroner has examined the remains (section 7050.5b). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the California Native American Heritage Commission (NAHC) within 24 hours (section 7050.5c). The NAHC will notify the Most Likely Descendant. With the permission of the landowner, the Most Likely Descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the Most Likely Descendant by the NAHC. The Most Likely Descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

METHODS

This cultural resource investigation consisted of a records search of the project area and a 0.5 mile radius around the project area at the NWIC, a search of the Sacred Lands File at the NAHC, and an intensive pedestrian survey of the project area.

Records Search

The records search was requested by Dudek archaeologist Scott Wolf on January 1, 2016 at the NWIC and responded to by the NWIC on January 22, 2016. The records search included examination of historic resource location maps, historic maps, and a review of previous studies performed in the area. The records search identified one cultural resource within the project's APE, one cultural resource within 0.5 miles of the project's APE, four previous cultural resource studies conducted within the project's APE, and ten previous studies that have been performed within 0.5 mile of the project area (Appendix A).

The records search identified one previously known cultural resource within the project's APE, the Las Gallinas Wastewater Treatment Plant itself (P-21-002672). The plant was erected 1954 indicating it is historic in age. However, the plant has undergone many renovations since its original construction and possesses no historically unique characteristics. Based on these observations, the plant was determined ineligible for the NRHP or CRHR (Appendix B; Lang and DeBaker 2009). One previously known cultural resource was also identified within 0.5 mile of the APE. The railroad tracks for the Northwestern Pacific Railroad (P-21-002618) are adjacent to, outside of, the force main replacement portion of the APE, directly to the west. The present alignment for the tracks was set in 1912-1913. The current tracks were upgraded in 1970s. Numerous other upgrades have substantially compromised the integrity of this resource as a whole and it was recommended to be ineligible for the NRHP and CRHR listing in 2008.

NAHC and Native American Correspondence

A Sacred Lands File search request was requested from the NAHC on January 20, 2016 by Dudek archaeologist Scott Wolf. The NAHC's response on February 18, 2016 failed to identify any Native American cultural resources within the project's APE (Appendix C). The NAHC also provided a Contact List of Native American representatives that may have additional information relating to cultural resources in the vicinity. Letters containing a brief project description and location were sent on March 1, 2016 to these individuals (both from the Federated Indians of Graton Rancheria) with a request for any additional information that might be provided (table 1). These letters were followed up this same day by a phone call.

Table 1. NAHC-listed tribal representative correspondence

Name and Title	Tribe / Organization	Date of Tribal Outreach			Response Received?
		Letters	*Telephone*	*E-mail*	
Greg Sarris, Chairperson	The Federated Indians of Graton Rancheria	March 1, 2016	March 1, 2016	--	No
Gene Buvelot	The Federated Indians of Graton Rancheria	March 1, 2016	March 1, 2016	--	No
Buffy McQuillen, THPO	The Federated Indians of Graton Rancheria	--	August 1, 2016	August 1+4, 2016	Yes - Noted potential for subsurface resources. At request, was provided report and NWIC search results. No additional response received.

A response was received on August 1, 2016 from Buffy McQuillen, Tribal Historic Preservation Officer (THPO) for the Federated Indians of Graton Rancheria. Ms. McQuillen noted that the area appeared to have potential for encountering subsurface cultural resources, and requested a copy of the NWIC records search results. The draft report and NWIC records search information were provided on August 4, 2016. No additional responses to this outreach have been received from tribal representatives to date.

Intensive Pedestrian Survey

An intensive pedestrian survey was performed by William Burns on January 21, 2016. All fieldwork was performed using standard archaeological procedures and techniques that meet the Secretary of Interior's Standards and Guidelines for cultural resources inventory and evaluation. The entire APE was surveyed on foot to look for surface artifacts, undisturbed areas, or historic structures. Subsurface exposures and rodent burrows were opportunistically inspected for indications of soils with the potential to contain archaeological deposits. A series of overview photographs were taken to document the current condition and previous disturbances to the section as well as to document the existing structures on the site.

The majority of areas throughout the APE were noted to have been subject to substantial disturbances related to construction of the wastewater treatment plant. This construction appears to have included cut-and-fill, trenching, pad preparation, and general grading activities. Office buildings, maintenance garages, and other facility structures are present in the western portion of the APE, and much of the remaining area is devoted to clarifying pools, parking areas, and landscaping. It appears that limited intact subsurface native soils remain.

The alignment of the proposed force main upgrade extends from the southwest entrance of the treatment plant and follows Smith Ranch Road south for approximately 1,400 feet. The road here has been cut out of the hillside, stabilized, and paved over. The alignment then extends west to the train tracks and turns south and follows the eastern side of the train tracks under a bed of fill to the southern boundary of the project area. All areas along the alignment of the force main replacement show high levels of ground disturbance. No artifacts or cultural resources were encountered during the pedestrian survey.

SUMMARY AND MANAGEMENT CONSIDERATIONS

The records search identified one previously recorded historical-era resource within the APE, the Las Gallinas Valley Wastewater Treatment Plant (P-21-002672), which was previously determined ineligible for NRHP or CRHR listing (Lang and DeBaker 2009). Through these evaluation efforts, P-21-002672 was not found be associated with any significant events locally, regionally, or nationally (NRHP Criterion A / CRHR Criterion 1); was not associated with, or cannot be connected with, the lives of any important people locally, regionally, or nationally (NRHP Criterion B / CRHR Criterion 2); does not exhibit any special architecture, design or engineering and represents little expression of aesthetics (NRHP Criterion C / CRHR Criterion 3); and a thorough documentation exhausted any potential to yield information locally, regionally, or nationally (NRHP Criterion D / CRHR Criterion 4) (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852). As P-21-002672 is not considered a significant or unique historical resource under CEQA or historic property under Section 106 of the NHPA, modifications to the Las Gallinas Valley Wastewater Treatment Plant will not represent a significant or adverse effect.

The Northwestern Pacific Railroad (P-21-002618), also identified during the records search, is located outside of the project's APE and will not be affected by the current project plans. No prehistoric resources have been identified in the APE or surrounding records search area. No additional cultural resources were identified during the intensive pedestrian survey. A NAHC Sacred lands File search failed to identify any Native American Resources. While tribal representatives of the Federated Indians of Graton Rancheria suggested there is potential for the area to contain subsurface resources, no specific concerns, information, or requests were provided. With the exception of a lagoon in the eastern portion of the APE and the extreme slope in the southern portion of the plant, all areas within the APE show signs of significant ground disturbance. Based on this information, it appears that no potentially significant cultural resources will be impacted (No Historic Properties Affected) by the proposed project as currently designed.

Management Recommendations

No additional cultural resources efforts, including cultural monitoring, are recommended to be necessary within the APE during ground disturbing activities. In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all earth-disturbing work occurring in the vicinity (generally within 100 feet of the find) shall immediately stop and the City notified. The City will retain a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, to evaluate the significance of the find and determine whether or not additional study is warranted. If the discovery proves significant under CEQA (14 CCR 15064.5(f); PRC Section 21082) or Section 106 of the NHPA (36 CFR 60.4), additional work such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted.

In accordance with Section 7050.5 of the California Health and Safety Code, if potential human remains are found, earth-disturbing work in the vicinity (generally 100 feet is sufficient) should immediately halt and county coroner notified of the discovery. The coroner will provide a determination within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, shall occur until a determination has been made. If the county coroner determines that the remains are, or are believed to be, Native American, they shall notify the NAHC within 24 hours. In accordance with California Public Resources Code Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendent (MLD) from the deceased Native American. Within 48 hours of their notification, the MLD will recommend to the lead agency their preferred treatment of the remains and associated grave goods.

If you have any questions regarding the findings of this report please contact Dudek archaeologist Adam Giacinto at agiacinto@dudek.com.

Respectfully Submitted,

William Burns, MSc, RPA
Archaeologist

cc: *Adam Giacinto, Dudek*
Sean O'Brien, Dudek

Att: *Figure 1. Regional Map*
Figure 2. Vicinity Map
Figure 3. Area of Potential Effect Map
National Archaeological Database Information Sheet
Appendix A: NWIC Records Search Results
Appendix B: Lang and DeBaker 2009 Las Gallinas Valley SDWTP Evaluation Report
Appendix C: NAHC and Tribal Correspondence
Appendix D: Resumes of Key Personnel

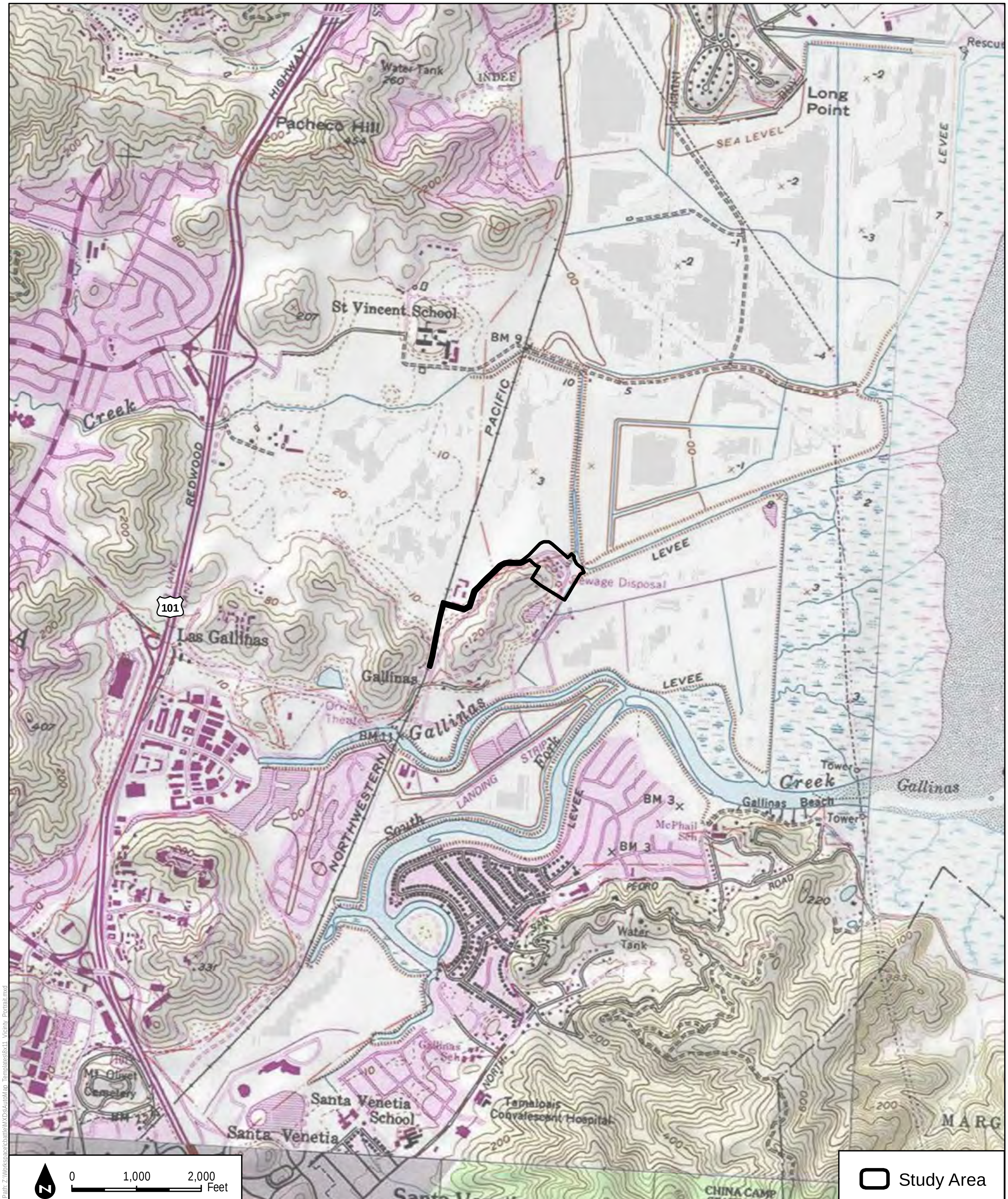
NATIONAL ARCHAEOLOGICAL DATABASE (NADB) INFORMATION

Authors:	William Burns, MSc, RPA, Micah Hale, PhD, RPA, and Adam Giacinto, MA, RPA
Firm:	Dudek
Project Proponent:	Las Gallinas Valley Sanitary District
Report Date:	June 22, 2018
Report Title:	Negative Cultural Resources Letter Report for the Las Gallinas Valley Sanitary District – Secondary Treatment Upgrade Project, Marin County, California
Type of Study:	Archaeological Inventory, Intensive Pedestrian Survey
Resources:	P-21-002672 (within APE); P-21-002618 (outside APE)
USGS Quads:	Novato
Area:	2600 linear feet
Keywords:	Intensive Pedestrian Survey, Negative, Wastewater Treatment Plant

FIGURE 1

Regional Map

Las Gallinas Valley Sanitary District



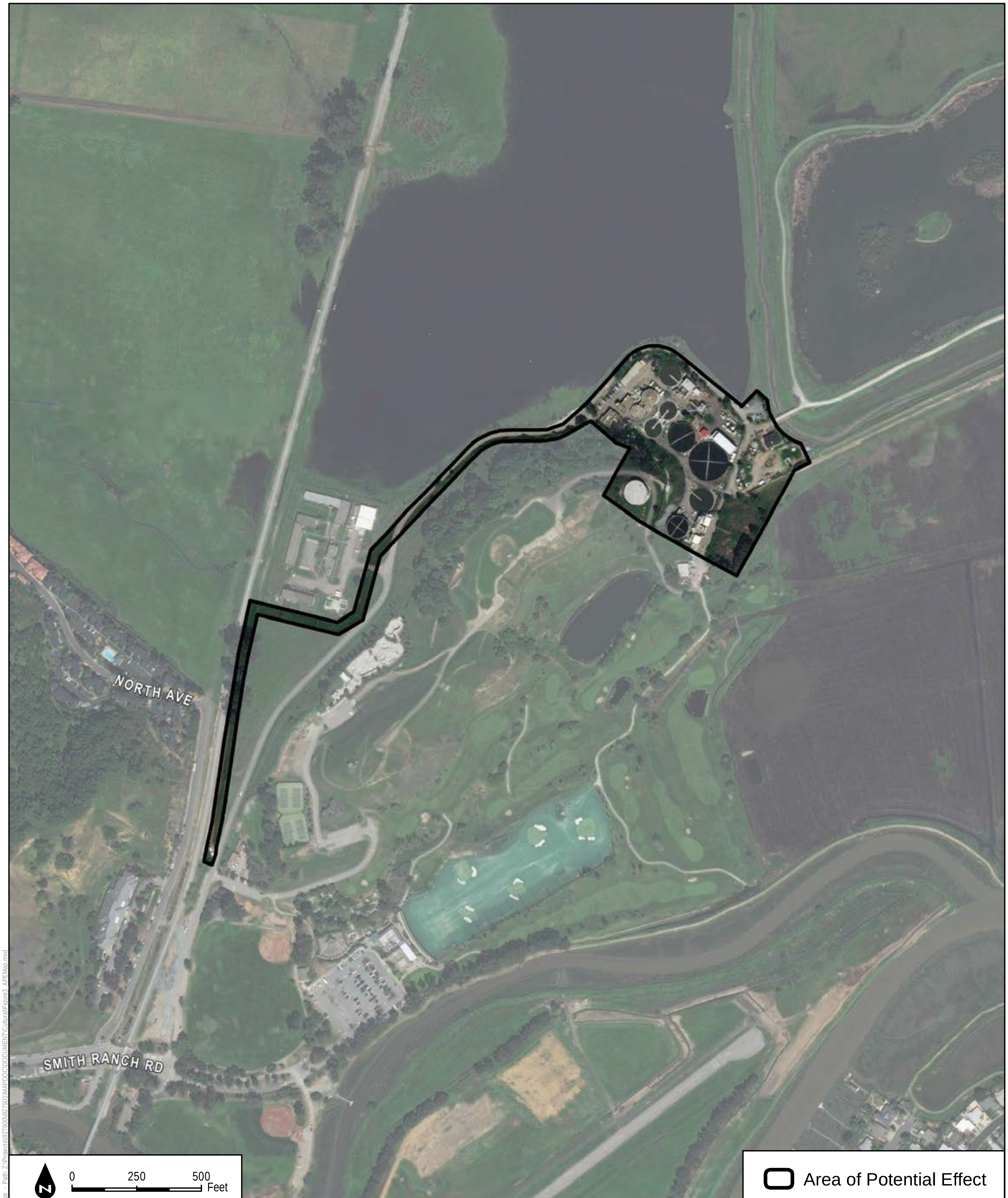
SOURCE: USGS 7.5-Minute Series Novato Quadrangle

FIGURE 2

Vicinity Map

DUDEK

Las Gallinas Valley Sanitary District



SOURCE: Bing Maps (Accessed 2018)

DUDEK

FIGURE 3
Area of Potential Effect

Las Gallinas Valley Sanitary District

APPENDIX A

NWIC Records Search

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

1/22/2016 NWIC File No.: 15-0940

Scott Wolf
Dudek
859 Second Street
Encinitas, CA 92024

Re: Las Gallinas Valley Sanitary District

The Northwest Information Center received your record search request for the project area referenced above, located on the Novato USGS 7.5' quad(s). The following reflects the results of the records search for the project area and a ½ mi. radius:

Resources within project area:	P-21-002672
Resources within ½ mi. radius:	P-21-002618
Reports within project area:	S-12150, 12946, 36371, 39171
Reports within ½ mi. radius:	S-5031, 11503, 11546, 13217, 16102, 23403, 26331, 29737, 31737, 36342
Other Reports within records search radius:	S-848, 2458, 8226, 9462, 9795, 15529, 16138, 16554, 17835, 18217, 20395, 22086, 32454, 32596, 33600, 42138. These reports are classified as Other Reports; reports with little or no field work or missing maps. The electronic maps do not depict study areas for these reports, however a list of these reports has been provided. In addition, you have not been charged any fees associated with these studies.

Resource Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Digital Database Records: ☒ enclosed ☐ not requested ☐ nothing listed

Report Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Report Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Report Digital Database Records: ☒ enclosed ☐ not requested ☐ nothing listed

Resource Record Copies: ☒ enclosed ☐ not requested ☐ nothing listed

Report Copies: ☒ enclosed ☐ not requested ☐ nothing listed

OHP Historic Properties Directory: ☒ enclosed ☐ not requested ☐ nothing listed

Archaeological Determinations of Eligibility: ☐ enclosed ☐ not requested ☒ nothing listed

CA Inventory of Historic Resources (1976):	☐ enclosed	☐ not requested	☒ nothing listed
Caltrans Bridge Survey: **	☐ enclosed	☐ not requested	☐ nothing listed
Ethnographic Information:	☒ enclosed	☐ not requested	☐ nothing listed
Historical Literature:	☐ enclosed	☐ not requested	☒ nothing listed
Historical Maps:	☒ enclosed	☐ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☐ not requested	☒ nothing listed
GLO and/or Rancho Plat Maps:	☒ enclosed	☐ not requested	☐ nothing listed
Shipwreck Inventory: **	☐ enclosed	☐ not requested	☐ nothing listed

*Notes:

- ** Current versions of these resources are available on-line:
- Caltrans Bridge Survey: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm
- Soil Survey: http://alabamamaps.ua.edu/historicalmaps/soilsurvey/California/california.html
- Shipwreck Inventory: http://www.slc.ca.gov/Info/Shipwrecks.html

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

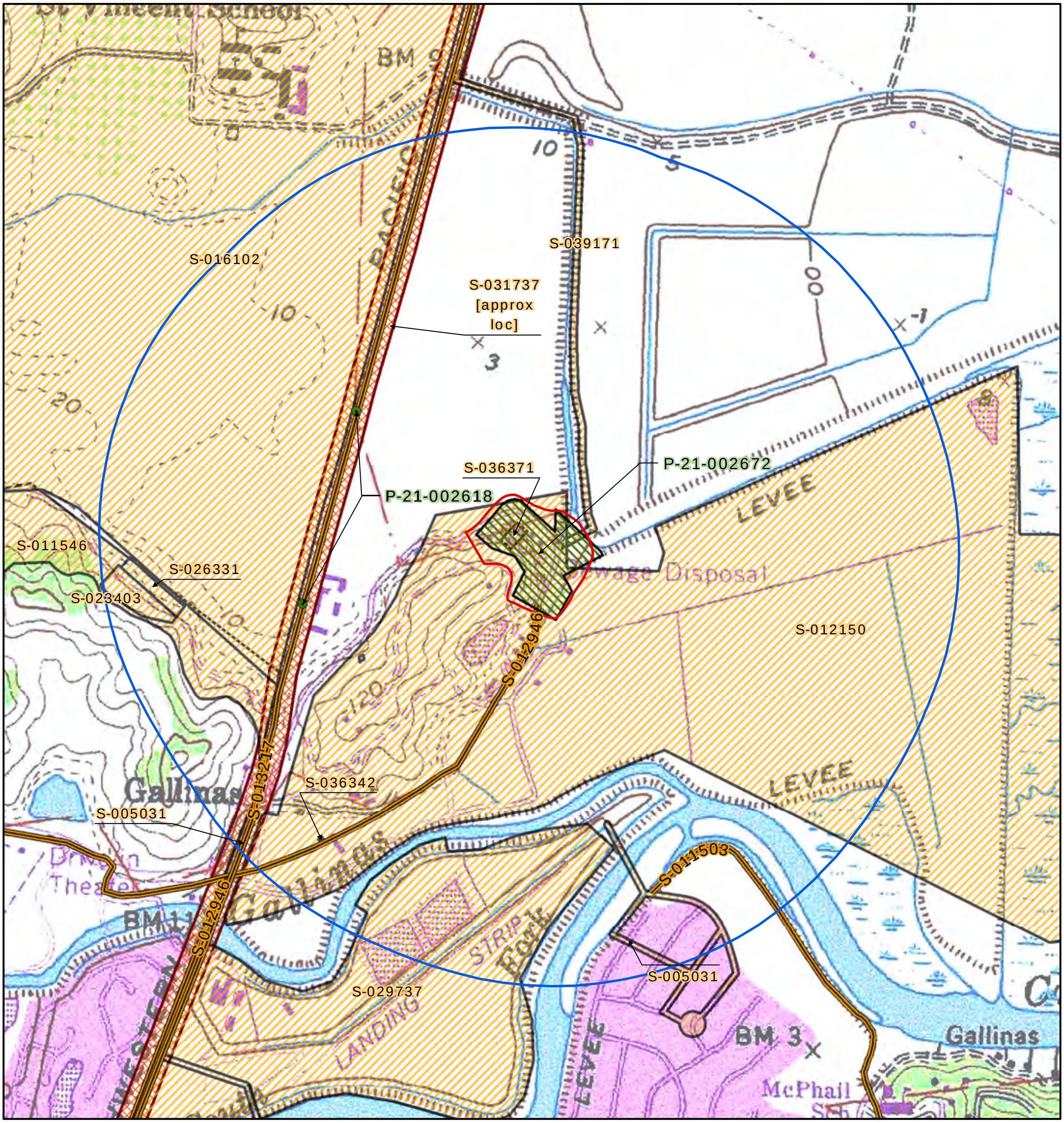
Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Annette Neal

Researcher

Las Gallinas Valley Sanitary District
Report & Resource Map #1



Northwest Information Center

File #15-0940 22 January 2016 A.Neal

May depict confidential cultural resource locations.
Do not distribute.

ProjectArea
ProjectArea_HalfMile_Buffer
Resources (points)
Resources (polygons)
Reports (lines)
Reports (polygons)
Reports approx loc

Resource Detail: P-21-002618

Identifying information

Primary No.: P-21-002618
Trinomial: CA-MRN-000699H
Name: Northwestern Pacific Railroad
Other IDs:

Type	*Name*
Resource Name	Northwestern Pacific Railroad

Cross-refs: Is an element of district 21-002838
See also 21-001015
See also 21-001026
See also 21-001193
See also 21-001194
See also 21-001198
See also 21-001199
See also 21-001200
See also 21-001208
See also 21-001295
See also 21-001707
See also 21-002663
Extends into another county as 12-000717
Extends into another county as 23-003663
Extends into another county as 49-002834

Attributes

Resource type: Structure, Object, Site, Element of district
Age: Historic
Information base: Survey, Analysis, Other
Attribute codes: AH02 (Foundations/structure pads); AH07 (Roads/trails/railroad grades); AH15 (Standing structures) - trestles; HP11 (Engineering structure) - train tunnels
Disclosure: Unrestricted
Collections: No
Accession no(s):
Facility:

General notes

Recording events

	Date	*Recorder(s)*	*Affiliation*	*Notes*
e	1/21/2004	Rand Herbert, Cindy Toffelmier	JRP Historical Consulting	Map Ref #3
c	11/14/2003	Rand Herbert	JRP Historical Consulting	Map Ref #1
d	1/21/2004	Rand Herbert/Cindy Toffelmier	JRP Historical Consulting	Map Ref #2
a	4/1/2003	Daniel Hart	Garcia & Assoc	Footing 14
b	4/1/2003	Daniel Hart	Garcia & Assoc	Footing 13
f	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 01
g	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 02
h	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 03 & 04
I	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 05 & 06
j	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 07& 08
k	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 09
l	2/6/2004	Daniel Hart	Garcia & Assoc	Footing 10, 11, & 12
m	11/1/2004	Andrew Hope	Clatrans	
n	6/16/2006	Melissa Gallagher	ASC/ SSU	
o	10/16/2008	B.Harris	Par Environmental	
p	10/1/2009	Toni Webb	JRP	
q	3/4/2010	A. DeGeorgey	NCRM	

Resource Detail: P-21-002618

Associated reports

Report No.	Year	Title	Affiliation
S-037827	2011	Extended Phase I Subsurface Geoarchaeological Investigation Report for the Central Marin Ferry Connection Project, Larkspur, Marin County, California, Federal Program #CML 6406 (010), 04-MRN-101, PM 8.5-8.9	Far Western Anthropological Research Group, Inc.
S-039171	2011	North Bay Water Reuse Authority, North Bay Water Recycling Program; Marin, Sonoma, and Napa Counties: Cultural Resources Survey Report	ESA-Cultural Resources Group
S-040317	2011	Historic Resources Evaluation Report, Central Marin Ferry Connection, Phase !, Marin County, California	JRP Historical Consulting, LLC
S-040318	2011	Historic Property Survey Report; 04 MRN Regional Measure 2 CML 6406 (010) Larkspur 00-000201-09 1	JRP Historical Consulting, LLC
S-040319	2011	Archaeological Survey Report for the Central Marin Ferry Connection Project, Larkspur, Marin County, CA, Federal program #CML 6406 (010), 04-Mrn-101,PM 8.5-8.9	Far Western Anthropological Research Group, Inc.
S-043710	2013	Cultural Resources Study, Phase II Greenbrae Pipeline Replacement Project	Cardno Entrix
S-044440	2014	Archaeological Survey Report for the 2014 Sonoma Multi-Agency Drill (M.A.D.) Prescribed Burn, Marin County, California	California Department of Forestry and Fire Protection

Location information

County: Marin

USGS quad(s): Asti, Cloverdale, Cotati, Elledge Peak, Geyserville, Healdsburg, Jimtown, Novato, Petaluma Point, Petaluma River, San Rafael, Santa Rosa, Sears Point, Ukiah, Willits

Address:

PLSS:

UTMs:

Management status

Database record metadata

	Date	User	
Entered:	9/26/2006	liz	
Last modified:	1/13/2016	simsa	
IC actions:	*Date*	*User*	*Action taken*
	1/11/2011	neala	added quads
	1/7/2015	neala	all records associated with the NWPRR have been separated back into individual counties. See other P#s for additional information

Record status: Verified

Resource Detail: P-21-002672

Identifying information

Primary No.:	P-21-002672	
Trinomial:		
Name:	Las Gallinas Sanitary District Wastewater Treatment Plant	
Other IDs:	*Type*	*Name*
	Resource Name	Las Gallinas Sanitary District Wastewater Treatment Plant
Cross-refs:		

Attributes

Resource type:	Building
Age:	Historic
Information base:	Survey, Analysis, Other
Attribute codes:	HP08 (Industrial building); HP09 (Public utility building); HP11 (Engineering structure)
Disclosure:	Unrestricted
Collections:	No
Accession no(s):	
Facility:	

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
8/7/2009	Jennifer Lang	Garcia and Associates	

Associated reports

Report No.	*Year*	*Title*	*Affiliation*
S-036371	2009	Cultural Resources Inventory and Evaluation of the Las Gallinas Valley Sanitary District Wastewater Treatment Plan, San Rafael, Marin County, California	Garcia and Associates

Location information

County:	Marin			
USGS quad(s):	Novato			
Address:	*Address*	*City*	*Assessor's parcel no.*	*Zip code*
	300 Smith Ranch Road	San Rafael		
PLSS:				
UTMs:	Zone 10 542416mE 4208760mN NAD83			

Management status

Database record metadata

	Date	*User*
Entered:	9/25/2009	jordanl
Last modified:	1/13/2016	simsa
IC actions:		
Record status:	Verified	

METADATA SHEET

P-12-000717
** P-21-002618
P-23-003663
P-49-002834

This resource is the Northwest Pacific Railroad; it crosses county lines and has therefore been assigned Primary and Trinomial Numbers in each of those counties. A portion of the record that applies to each county can be found in the Primary file for each county.

There are several disjointed resources associated with this railroad. All railroad segments, grades, trestles, culverts, and crossings that are associated with this railroad have been, or will be, subsumed into the appropriate county Primary Number.

Any buildings such as, but not limited to, depots and stations, will be assigned individual Primary Numbers. Any buildings that have previously been assigned an individual Primary or HRI Number will retain their numbers but will reference the main Northwest Pacific Railroad Primary Number files.

The following Trinomial and Primary Numbers have been assigned and the resource records are filed in the Primary Number files within each county:

P-12-000717/CA-HUM-726H
P-21-002618/CA-MRN-699H
P-23-003663/CA-MEN-3111H
P-49-002834/CA-SON-2322H

Date: September 24, 2014

NWIC Staff: C. Mikulik

r

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # ~~P-21-002618~~
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code Reviewer Date

***Resource Name or #:** NWP Railroad

P1. Other Identifier:
***P2. Location:** ■ Not for Publication ***a. County:** Marin
***b. USGS 7.5' Quad:** San Rafael **Date:** 1995 **T**1N;**R**6W;
Unmapped Section of the San Pedro Santa Margatira y Las Gallina Land Grant
c. Address: **City:** San Rafael **Zip:**94915
d. UTM: Zone: 10; 5541899mE/ 4202899mN (NAD 83)
e. Other Locational Data: In the City of San Rafael at the intersection of 4th Street and Tamapais Avenue.

***P3a. Description:** This historic resource consists of a segment of the Santa Fe and Northern Pacific Railroad. This railroad is a standard gauge tack the crosses perpendicular to 4th Street. It was originally constructed in about 1879 and connected the cities of San Rafael and Petaluma through the Porto Suello tunnel.

***P3b. Resource Attributes:** HP18 Train track, ~~HP17 Depot~~
***P4. Resources Present:** AH7 Railroad

P5b. Description of Photo: Overview of railroad tracks from intersection 4th Street and Tamalpais Avenue, View north; image DSCN8505.

***P6. Age:** ■Historic / ca. 1879

***P7. Owner and Address:**
City of San Rafael
111 Morphew St.
San Rafael, CA 94915-1560

***P8. Recorded by:**
A. DeGeorgey,
NCRM
6190 North Street
Calpella, CA 94418

***P9. Date Recorded:** 3/4/10

***P10. Survey Type:** Intensive
(transect intervals <20 meters)

***P11. Report Citation:**
DeGeorgey, Alex
2010 *Negative Archaeological Survey Report of The Puerto Suello To Transit Cenner Connection Project (04-MRN-0-SRF), City of San Rafael, Marin County, California* Ms. on file at the Northwest Information Center.

***Attachments:** ■ Location Map ■ Continuation Sheet ■ Linear Feature Record

9

APR - 7 2010

***Resource Name or #:** NWP RR

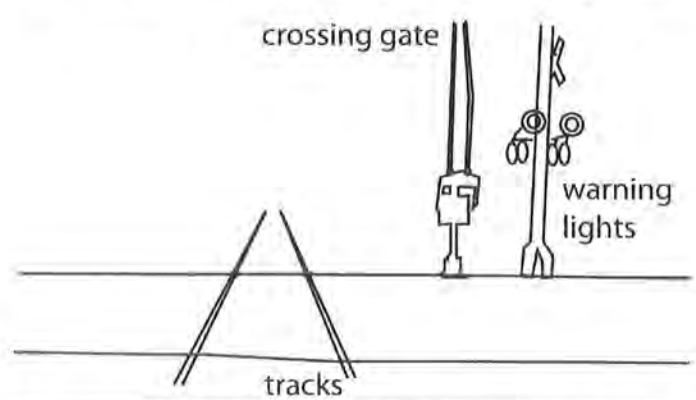
L1. Historic and/or Common Name: 1879 Santa Fe and North Pacific Railroad
L2a. Portion Described: ☐ Entire Resource ■ Segment ☐ Point Observation **Designation:**
b. Location of point or segment: This segment of track in orientated north-south.

L3. Description: In 1879, the Santa Fe and the Northern Pacific Railroads established a route to San Francisco. This standard gauge line connected the cities of San Rafael and Petaluma through the Porto Suello tunnel.

L4. Dimensions:
- **a. Top Width** 4 ft.
- **b. Bottom Width** 4 ft.
- **c. Height or Depth** (n/a)
- **d. Length of Segment** 60 feet

L5. Associated Resources: The former location of the san Rafael Union Station is located adjacent the south side of this resource. In 1884, the San Rafael Union Station was built by the Santa Fe and Northern Pacific Railroad. The depot was located on the west side of Tamalpais Avenue between 3rd and 4th Streets (Codoni 1995:7). "The arcade-like structure offered a primitive form of air conditioning in the days when locomotives routinely emitted prodigious quantities of smoke, gases, and steam. Conversely there was scant protection for waiting passengers from rain, wind, and cold" (Codoni and Trimble 2006:29). The 1887 Sanborn Map depicts the San Rafael Union Station as including four sets of tracks that enter the south depot, an office building adjacent the west side of the station, as well as associated turntable, round house, warehouse, livestock corral, and water tank (Figure 7). By 1906, the Southern Pacific and Santa Fe Railroads had bought out all of the forty other short line roads in Marin County and areas north. In 1907, they consolidated these 41 lines under one company, the Northwestern Pacific Railroad (Codoni and Trimble 2006). By 1930, all rails were abandoned by the NWP (Stindt 1985:84).

L4e. Sketch of Cross-Section (not to scale) **Facing:** North



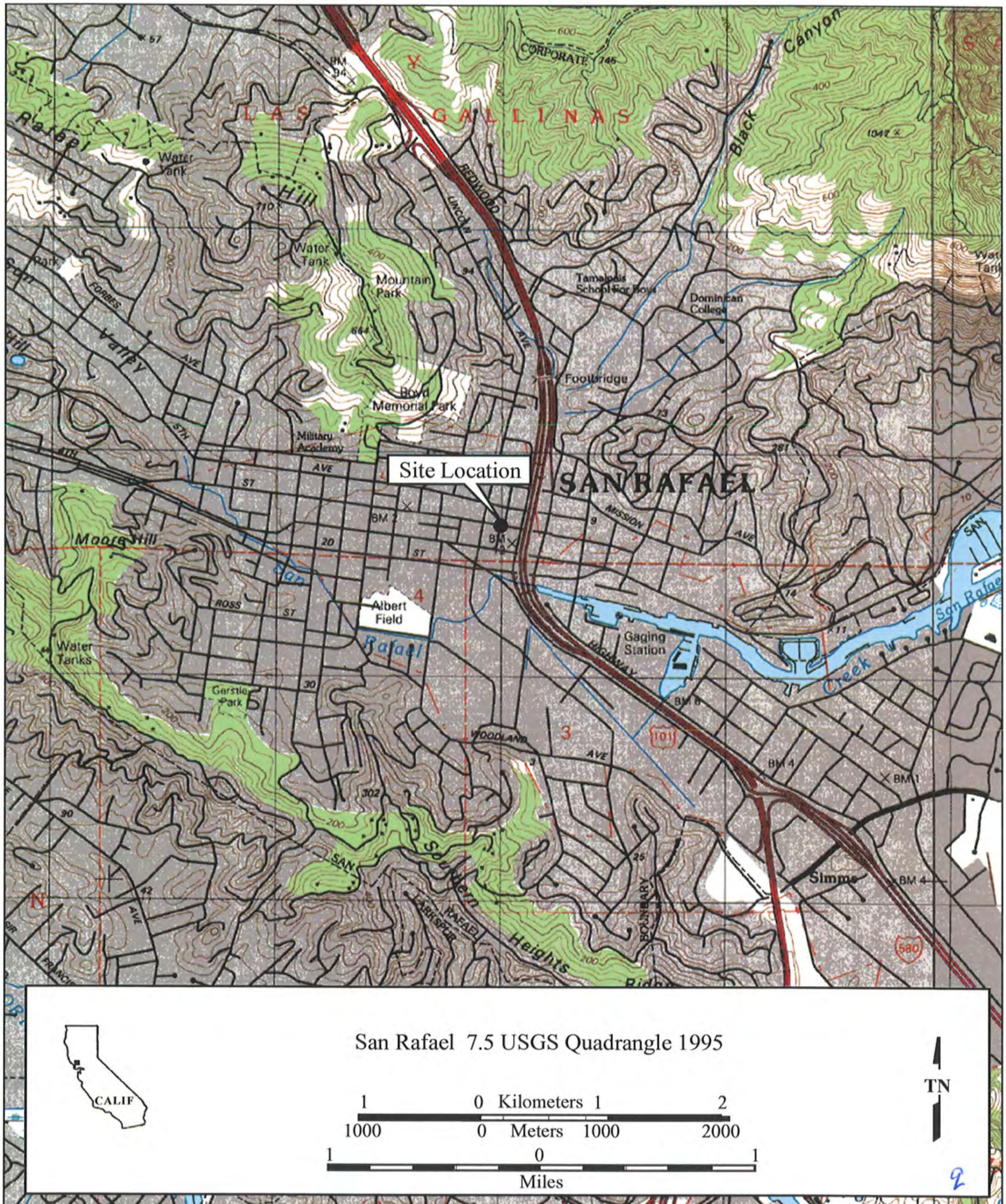
L6. Setting: This historic resource is located in an urban environment within the City of San Rafael at the intersection of 4th Street and Tamalpais Avenue.

L7. Integrity Considerations: This segment of track is intact and in good condition. Forth Street has paved over the ties of the track but the rails are exposed and still visible.

LOCATION MAP

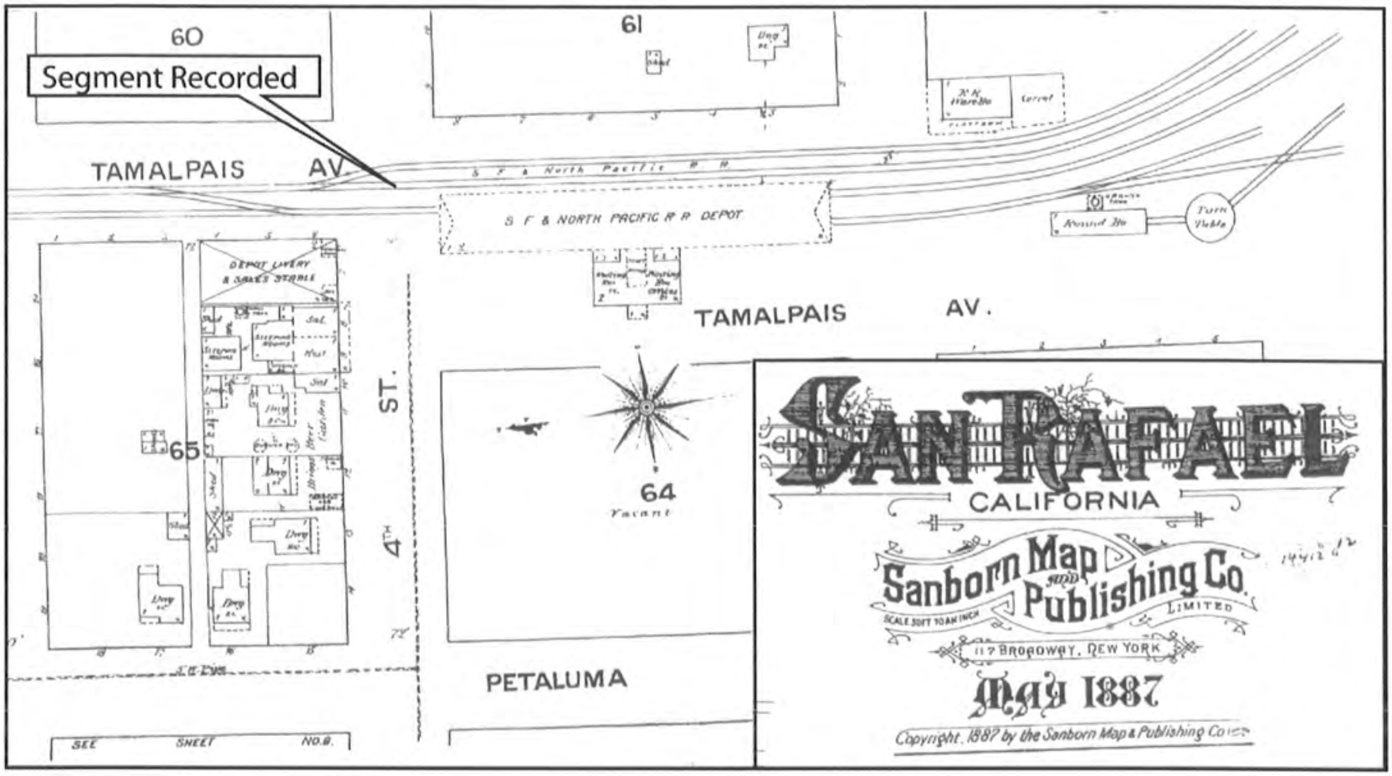
Primary # P-21-002618
HRI#
Trinomial

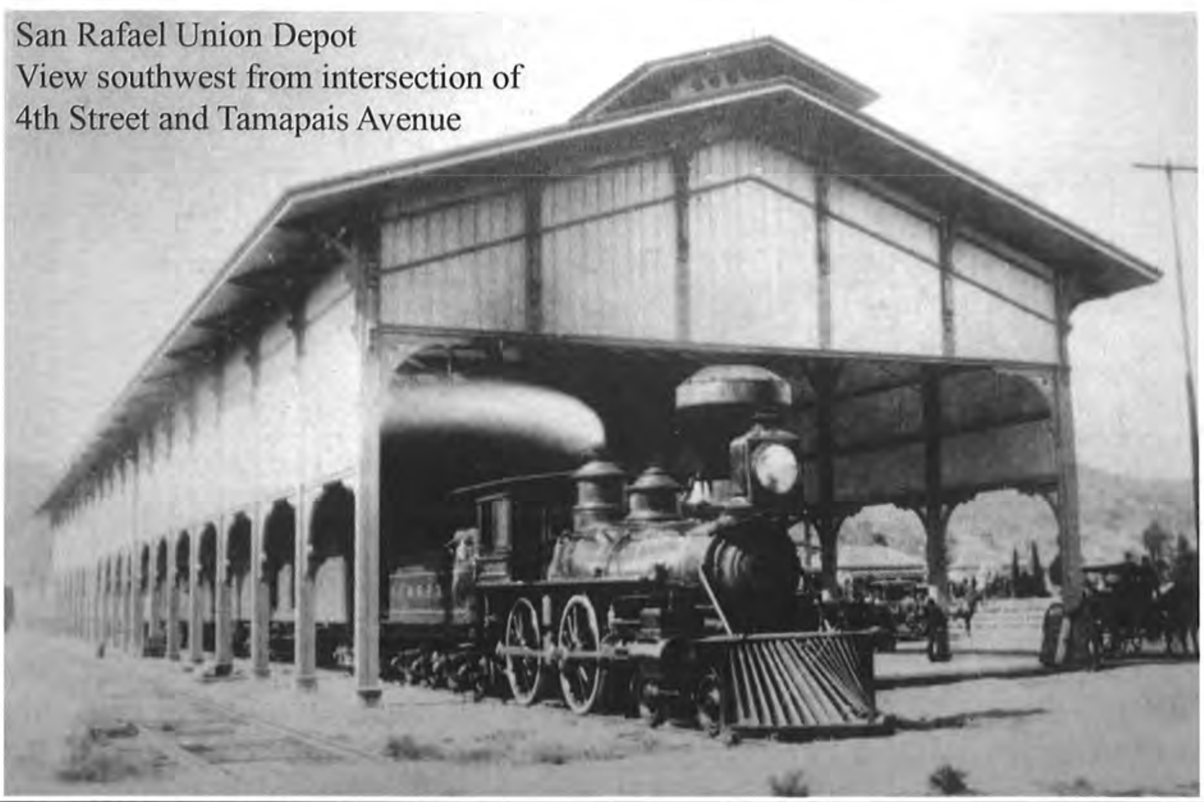
*Resource Name or #: NWP RR

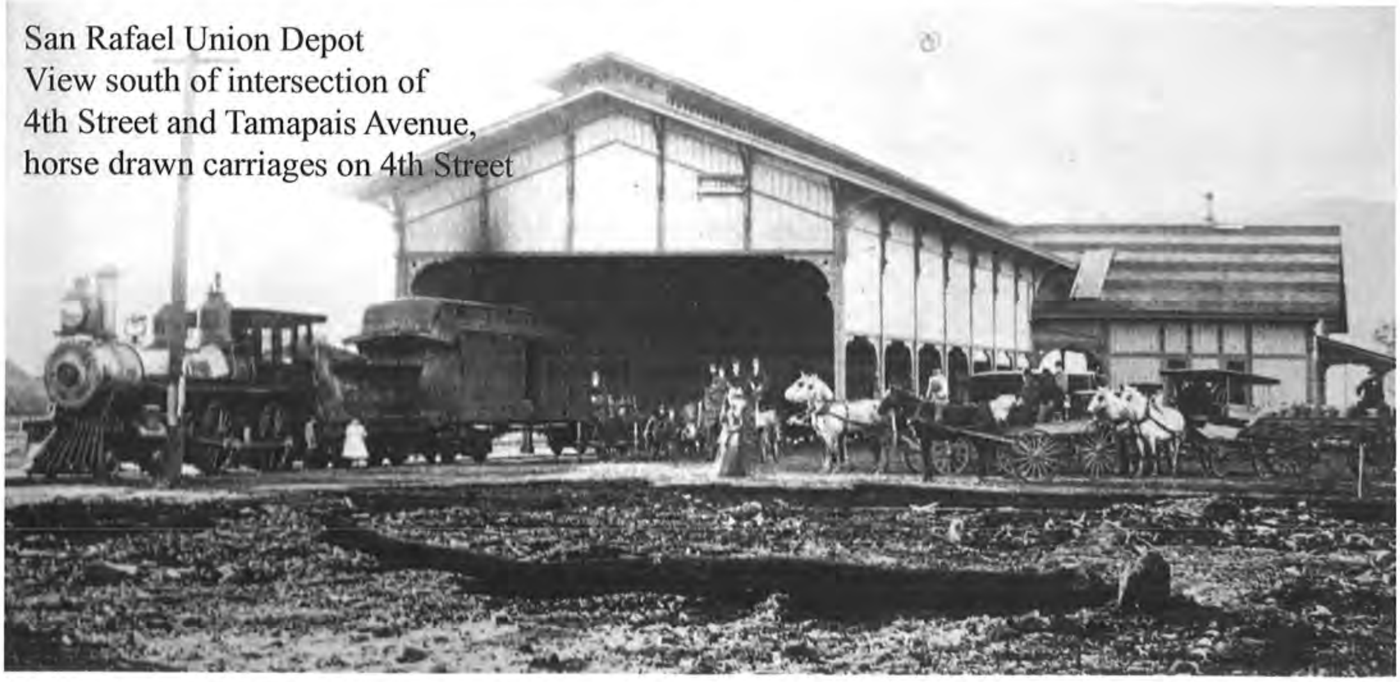


2

*Required Information




San Rafael Union Depot
View southwest from intersection of
4th Street and Tamapais Avenue



San Rafael Union Depot
View south of intersection of
4th Street and Tamapais Avenue,
horse drawn carriages on 4th Street

References

Codoni, Fred

1995 Marvelous Marin, Inc. V.S. the NWP: Civic Group Prods the Railroad. In *The Northwestern*, Fall-Winter issue 1995. Ms. on file at the Marin County Library California Room.

Codoni, Fred and Paul Trimble

2006 *Northwestern Pacific Railroad.* Published by the Northwestern Pacific Railroad Historical Society.

Sanborn Map and Publishing Company

1887 Sanborn Fire Insurance Maps, May 1887
1894 Sanborn Fire Insurance Maps, December 1894
1907 Sanborn Fire Insurance Maps, March 1907
1924 Sanborn Fire Insurance Maps, April 1924 thru June 1950

Stindt, Fred

1984 *Northwestern Pacific Railroad Redwood Empire Route.* Originally published in 1964 by Fred Stindt.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI # ______
Trinomial CA-MRN-699H
NRHP Status Code 6Z
Other Listings ______
Review Code ______ Reviewer ______ Date ______

 ***Resource Name or #** Map Reference No. 1

P1. Other Identifier: Segment of the Northwestern Pacific Railroad and Trestle over Corte Madera Creek

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Rafael **Date** 1995 **T** ___; **R** ___; ___ **¼ of Sec** ___; ______ **B.M.**

c. Address ______ City Larkspur Zip ______

d. UTM: (give more than one for large and/or linear resources) Zone ______; ______ mE/ ______ mN

e. Other Locational Data: APNs 018-171-019, 018-171-018, 018-171-017, 018-172-001, and 018-172-002

***P3a. Description:**

This form addresses a 0.4-mile discontinuous segment of the Northwestern Pacific Railroad (NWP) located in Larkspur. From its northernmost point at the southern end of the Cal Hill Park Tunnel, this segment follows a southeasterly path generally parallels US 101 on the east side until Sir Francis Drake Boulevard, where it then takes to a more southern course to Corte Madera Creek. The segment includes a portion of a wood trestle built in 1924. This railroad segment is no longer in service and vegetation and earth covers the tracks and ballast. At this location, the former rail line consists of a single set of at-grade tracks. Rails rest on a mix of pressure-treated and non-pressure treated ties. A large section of the alignment (approximately 780 feet) has been converted to graveled parking lots for nearby businesses and as a result, tracks and ties in this area have been removed and/or buried. Similarly, while only tracks are evident just north of the parking lot, it is possible that ties are buried up to the tunnel. The open deck wood trestle carries a single track. According to previous evaluations of this trestle (completed by Caltrans in 1988 and Carey & Co. in 2003), this 1924 structure was altered and upgraded in the 1970s and early 1990s. Presently, the trestle is about 408 feet long, 15 feet high, and consists of series of five-pile bents with transverse and longitudinal bracing (X-bracing) treated with creosote. The outer two piles in each tower are battered. A pile cap over each pile section supports the stringer. (See Continuation Sheet)

***P3b. Resource Attributes:** (List attributes and codes) (HP11) Railroad; (HP11) Trestle

***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☒ Element of District ☐ Other (Isolates, etc.)

P5a. Photo of Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: View of extant tracks north of Sir Francis Drake Boulevard, camera facing south

***P6. Date Constructed/Age and Sources:** ☒ Historic ☐ Prehistoric ☐ Both
Alignment 1884; Tracks ca. 1912-1913; trestle 1924 (historic documents)

***P7. Owner and Address:**
Sonoma-Marin Area Rail Transit District, 750 Lindaro Street, Suite 200, San Rafael, CA 94901

***P8. Recorded by:**
Toni Webb, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis, CA 95618

***P9. Date Recorded:** June 2008 & October 2009

***P10. Survey Type:** Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, LLC, "Historic Resources Evaluation Report for Central Marin Ferry Connection, Phase I."

***Attachments:** ☐ NONE ☐ Location Map ☒ Sketch 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) ______

DPR 523A (1/95) ***Required Information**

p

*NRHP Status Code 6Z

*Resource Name or # Map Reference No. 1

B1. Historic Name: Northwestern Pacific Railroad

B2. Common Name: Northwestern Pacific Railroad

B3. Original Use: Railroad B4. Present Use: Non-operational rail line

***B5. Architectural Style:** None

***B6. Construction History:** Original rail alignment 1884; current tracks ca. 1912-1913; trestle 1924, upgraded 1970s

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown Date:** ____ **Original Location:** ____

***B8. Related Features:** ____

B9. Architect: ____ b. Builder: Northwestern Pacific Railroad

***B10. Significance: Theme** n/a **Area** n/a

Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This 0.4-mile segment (including its associated trestle) of the Northwestern Pacific Railroad (NWP) does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR), nor does it appear to be a historical resource for the purposes of CEQA. Within the last twenty years at least five sections of this rail line have been subject to NRHP and CRHR evaluations. First, Caltrans evaluated the Corte Madera Creek trestle (which is documented on this form) in 1988 and found that it did not appear to be eligible for the NRHP. In 2003, JRP inventoried and evaluated an adjacent segment of the NWP and two of its associated features (California Park Hill Railroad Tunnel and a wood trestle over Auburn Street) for the report entitled "Historical Resources Inventory and Evaluation Report: Northwestern Pacific Railroad Segment, California Park Hill Railroad Tunnel Project (2003)." JRP found that that segment of railroad, the trestle, and tunnel, lacked integrity and significance and did not appear to meet the criteria for listing in either the NRHP or CRHR. The tunnel, trestle and rail segment were determined, by consensus, ineligible in 2005. That same year JRP prepared an evaluation report for the Route 101 Eureka-Arcata Corridor Highway Improvement Project for Caltrans and evaluated a 5-mile segment of NWP between Arcata and Eureka. JRP found that the segment lacked significance and integrity and did not appear eligible for either the NRHP or CRHR. The railroad segment was determined ineligible in 2006.

In 2004, Garcia and Associates (Garcia) completed a study of the NWP corridor from Larkspur Landing to Cloverdale for the Sonoma-Marin Area Rail Transit (SMART) Project. According to that report, the "NWP corridor and its associated elements do not possess significance as a cultural landscape of historic district." Garcia concluded that the NWP lacked integrity of location, design, setting, materials, workmanship, feeling and association, and the corridor was not eligible under Criterion A "because the line is a composition of Marin and Sonoma county rail systems formed into the NWP in 1907. The NWP line and its predecessors did not bring sustained economic benefit to the communities along (See Continuation Sheet)

B11. Additional Resource Attributes: ___

***B12. References:** Garcia and Associates, "Historic Architectural Resources Technical Report for the Sonoma-Marin Area Rail Transit (SMART) Project," (October 2004) 62, 64-68, and DPR523 Form, District Record for NWP (May 2004); JRP Historical Consulting, "HRER Route 101 Eureka-Arcata Corridor Highway Improvement Project," (October 2003); "The Donahue Extension," *Marin County Journal*, October 25, 1884, 2; Public Utilities Commission, "Profile and Alignment Mapping . . . Tiburon to Sonoma County Line, Marin County, California," October 3, 1912; "Railroad Company Expends $800,000," *Marin County Journal*, October 2, 1924, 8; Gregory King, "Evaluation of the Trestle over Sir Francis Drake Boulevard in the City of Larkspur" (Sacramento: Caltrans, 1988); California Historical Resources Information System (CHRIS), September 18, 2006: Northwestern Pacific Railroad, Auburn Street Trestle, and California Park Hill Tunnel are all assigned the California Historical Resource Status Code of 6Y (Determined ineligible for NRHP by consensus through the 106 process); CHRIS, February 9, 2009: Portion of the Northwestern Pacific Railroad, assigned Status Code 6Y.

B13. Remarks:

***B14. Evaluator:** Toni Webb

***Date of Evaluation:** June 25, 2008

(This space reserved for official comments.)

See continuation sheet.

P3a. Description (continued):

Heavy beams, placed parallel beneath the steel rails, are bolted to the cap. Post are bored directly into the ground. Some bracing has been removed between bents near the bascule bridge. In 2001, the portion of the section (about 164') that crosses Sir Francis Drake Boulevard was removed. Remnants of the trestle's concrete abutment are still extant within the ballast on the north side of Sir Francis Drake Boulevard.

B10. Significance (continued):

the line, and did not play a pioneering role creating new towns along the route." Furthermore, Garcia found that under Criterion C, the corridor was not eligible because it lacked integrity and that the "trestles lack individual distinction and many have been replaced, or modified, and they do not appear eligible for the NRHP under Criterion C as contributing elements to a district or on an individual basis." However, Garcia noted that "a 5.4-mile section in the Petaluma River Delta (Burdell Siding MP 31.3 to the Haystack Swing Bridge MP36.7) appears to be NRHP eligible as an intact cultural landscape and for its association with Peter Donahue." Additionally, the report indicated that two NWP bridges (Russian River bridge in Healdsburg and Haystack bridge in near Petaluma) are "potentially eligible" for the NRHP, several stations are listed or eligible for the NRHP (Healdsburg, Petaluma, Novato, and San Rafael), and the Healdsburg Turntable is determined eligible for the NRHP. As part of the SMART study, Garcia also prepared a DPR 523 form (dated August 2003) evaluating 41 open deck trestles along the same 71-mile segment of the NWP between Larkspur Landing and Cloverdale. The form documented "representative examples of all resources of this type [trestles]" and briefly addressed integrity of those resources overall by noting "with exceptions, the conditions of the trestles are quite good . . . and they retain the ability to relay the sense of the historic railroading era." Garcia did not individually identify, describe, or address individual integrity of any of the 41 trestles under evaluation but found that the trestles appeared to be contributors to a larger NWP historic district, presumably the 5.4-mile Petaluma River Delta section noted above, which included culverts, siding, signal lights, trestles and telephone poles. The form notes that the "historic Northwestern Pacific Railroad (NWP) is perhaps the best extant example of nineteenth and early-twentieth century railroading in the North San Francisco Bay Area" and that "trestles collectively represent an important feature of the overall railroad corridor, and aid the rail line in retaining its integrity of location, design, setting, materials, feeling, and association . . . the trestles would be a contributing element of a historic district centered around the Northwestern Pacific Railroad." The form cited eligibility at the state and local level under NRHP Criterion A, within the context of economic development (including transportation & communication), and the period of significance given was identified as 1874-1955.[1] To date it does not appear that any determination of eligibility has been made regarding the Garcia evaluation.

Lastly, in 2003, Carey & Co., Inc. (Carey) prepared a report "Historic Resource Evaluation, Larkspur Rail Trestle, Larkspur, California" and found that the trestle as a whole may be historically significant under CRHR Criterion 1, for its association with "the development and expansion of the railways in Marin County," and CRHR Criterion 3, for its construction method and use of wood. However, Carey concluded that "while the Larkspur rail trestle may be considered historically significant as a complete structure, the integrity of the 100-foot section of the structure ... has been severely compromised." According to Carey, work conducted by Caltrans in 1976 included the removal of 127 feet of the trestle; removal of seven bents; addition of seven new bents at different locations; addition of an eighth bent; replacement and reconfiguration of stringers; and reconstruction of the piles. Additionally, Carey noted that in 1992, the City of Larkspur modified this same section altered by Caltrans. Work completed at this time included the removal, rebuilding, and extension of the trestle section that crosses Sir Francis Drake Boulevard; re-grading of the hill adjacent to the road; construction of a new abutment; and the removal and replacement of rails. Thus, Carey concluded that the specific segment of the trestle did not meet the CRHR eligibility criteria.[2]

The current survey updates these previous studies and evaluates a non-operational segment contiguous to the California Park Hill Railroad Tunnel.

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[1] Garcia and Associates, Historic Architectural Resources Technical Report for the Sonoma-Marin Area Rail Transit (SMART) Project," (October 2004) 62, 64-68; Garcia and Associates, DPR523 Form, Open Deck Trestles, (August 2003).

[2] Carey & Co., Inc. "Historic Resource Evaluation, Larkspur Rail Trestle, Larkspur, CA," February 2003, 5-6.

The first railroad tracks laid over this extant alignment were constructed in 1884 by San Francisco & San Rafael Railroad as part of the railroad between Tiburon and San Rafael to connect a standard gauge line to ferry service on San Francisco Bay. The line was single track and approximately nine miles long. After NWP incorporated in 1907, the railroad began installing double tracks along its alignment, including the line between Detour and San Rafael, which included the 0.4-mile section under study. The extant tracks documented on this form were completed by 1913 and were part of the main line for steam passenger service out of Sausalito and the main line for freight out of Tiburon. This segment of track again came under scrutiny in the 1920s during a general modernization of NWP resources. During 1924, NWP spent over $800,000 in Marin County on improvements, part of which included installing the electric interurban third rail system over the Baltimore Park-Detour cut-off and the section between Detour and San Rafael. The trestle and adjacent bascule bridge over Corte Madera Creek were also constructed during this improvement campaign. The last electric interurban train in southern Marin County ran until February 1941 and that same year, the southern terminal of NWP passenger operations shifted from Sausalito to San Rafael. No longer necessary, NWP removed both electric third rail and original 1884 track. While the rails along the trestle and bridge over Corte Madera Creek appear to date to the mid 1920s, the non-operational, single track segment between Sir Francis Drake Boulevard and the California Park Hill Tunnel dates to approximately 1913.

Evaluation

Examining a single segment or structural element of NWP for significance requires the evaluation to consider its context as an element in the entire line as well as an individual segment or structure. This short segment (and trestle) is part of a vast number of elements comprising the larger NWP system, which included over 570 miles of track, 47 tunnels, 62 bridges in excess of 300 feet, 57 trestles in excess of 300 feet, and numerous smaller trestles of varying designs. Collectively, all of these elements served important functions to the total NWP system.

Under Criterion A, railroads, with their associated tunnels, trestles and bridges are potentially significant under Criterion A if they are importantly associated with trends and/or events in transportation development regional or local economic development. Establishing significance, though, should be done with certain principles in mind. Railroads, like other transportation infrastructure, are inherently important to their communities as they substantially affect communication and the distribution of people, goods, and services that in turn affects development on both the local and regional levels. This impact does not typically provide sufficient evidence to demonstrate how a railroad line may be deemed significant for its association with an important historic context; otherwise virtually any railroad, with associated structures would be shown to be important in this way.

To be eligible for listing in the NRHP, resource types such as railroads and other transportation infrastructure must have demonstrable importance directly related to important historic events and trends, with emphasis given to specific demand for such infrastructure, and its effects on social, economic, commercial, and industrial developments locally, regionally, or nationally. In this way, railroad lines and associated structures, may be significant as physical manifestations of important transportation and community developments on the local, regional, state, or national level.

The most common instance in which a railroad line or its separate structural components might be considered under Criterion A would be if either the line or separate components (tunnels, trestles, or bridges) were the first to be located at its site, thus providing expanded transportation opportunity and advancing economic development into previously isolated or underdeveloped areas. This development trend is identified as "ahead of demand" development, indicating the transportation route predated development and subsequent development directly related to the presence of the transportation route. One such example of this development pattern would be the line Southern Pacific Railroad constructed down the length of California's San Joaquin Valley. While several towns connected by wagon road existed in the Central Valley, the placement of the new line away from the wagon road initiated the development of a large number of new towns along the new transportation route. These towns, now centers of main populations, exist because the railroad was built through a previously undeveloped area, which in turn opened a new area for economic development.

Railroad lines might also be considered significant under Criterion A if they were likely built to meet specific demands and resulted in immediate and/or substantial effects to a geographic location. While this level of importance typically can be associated with the initial transportation avenue at a particular location, in some cases it can be true of subsequent roads, railroad lines, or highways.

Incorporated in 1907, NWP was a consolidation of numerous lines built to meet a specific demand, to facilitate the movement of local products to a wider market, though their construction did not bring immediate or substantial effects to a geographic location. Throughout the nineteenth century, the North Bay counties of Marin and Sonoma continually searched for ways to expand market potential for their local products. Because they were separated by the bay from San Francisco, their main market, connecting to water transportation was imperative. Farming communities established in the 1850s first hauled their goods over wagon roads to rivers that connected to the steam ferryboats, a system that existed on the San Francisco Bay from the early days of the gold rush. These early railroad lines were built to facilitate a process already occurring by other transportation methods. While one could argue that these predecessor lines were built to meet one specific demand, their construction did not bring an immediate or substantial effect to their geographic location. The original lines did not open new areas for development, but were rather an attempt by local citizens to use more modern transportation technology to improve existing access to market.

In addition, the lines were not financially successful. Railroad entrepreneurs expected to turn a profit with their investments. Such was not the case in this area, as evidenced by the fact that approximately one-third of the companies that became part of the NWP never laid track. From a financial perspective, the predecessor lines of NWP were not a success.

The same can be said for NWP after its incorporation. Formation of NWP occurred through the desire of the SP and Santa Fe to profit from the north coast timber industry freight market, and building a rail line connecting north coast lumber mills with the San Francisco shipping lines was long desired by the industry. Because of enormous costs, construction needed the financial backing of companies of the size of SP and Santa Fe. Even these two major railroads recognized that their financial interest dictated a merger rather than competition. Upon incorporation, NWP constructed the line through the Eel River canyon and opened through service to Eureka. However, the line between Willits and Eureka was finally completed in 1914, at the end of the age of dominance of railroad transport. The automobile was already having an impact on transportation trends, and California was in the beginning stages of developing a state highway system.

Although the impetus for incorporating NWP was to move freight, mainly timber products, from the north coast lumber mills to San Francisco market and distribution centers, fluctuation in the timber industry required a broader approach to financial stability for NWP. Passenger service became the primary concern in the early years after incorporation. NWP ran a complicated network of narrow gauge local freight and passenger lines, standard gauge local freight and passenger lines, and electrified interurban standard gauge lines through established communities. NWP pursued an aggressive marketing program promoting recreation destinations and Marin County real estate, although had marginal success. Population statistics indicate a slight decrease in San Rafael's population between 1910 and 1920. Additionally, although throughout Marin County population increased during the 1910-1920 decade, increases were significantly below population increases in other San Francisco Bay Area counties. Population statistics indicate a significant growth in population between 1920 and 1930 throughout Marin County, but increases were slightly below population increases in the San Francisco Bay Area counties.[3] This growth was perhaps enhanced by the developing infrastructure, such as the completion of the new paved state highway (Redwood Highway) that linked San Francisco to Eureka, which became the primary north-south transportation route through Marin County spurring settlement in the region, but was not particularly attributable to NWP or its rehabilitation projects.[4]

Marketing the Redwood Coast as a recreation destination and promoting Marin County real estate projects proved moderately successful in boosting revenues, but could not offset the financial loses of the freight service and electric railway. In inheriting the electric interurban system through consolidation, NWP faced a continual struggle to run a cost-effective and efficient line. NWP undertook massive updating projects to improve passenger service over the aging lines with realignment projects, rebuilding tunnels, trestles, and bridges, and replacing aging rolling stock. None of the measures proved effective. Heavy annual losses caused Santa Fe to sell out to SP in 1929. Continued losses prompted SP to abandon the electric interurban line. Throughout its history, NWP struggled to be profitable. This does not suggest that the NWP was

[3] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990."

[4] "S.F.- Eureka Highway in Good Shape," *Oakland Tribune*, March 11, 1923; California State Department of Finance, Demographic Research Unit, "Historical Census Populations of Places, Towns, and Cities in California, 1850-2000," accessed online on November 3, 2010 at www.dof.ca.gov/research/demographic/reports/census-surveys/historical_1850-2000/.

particularly influential in north bay development, certainly not in the way that other rail lines (such as the SP line through the San Joaquin Valley) were in other areas of California, or, indeed, the western U.S.

As outlined above, it would not appear that during its period of operation (1907-ca. 1959) the NWP was not significantly responsible for opening new areas for social, economic, commercial, or industrial development, nor once built did it have in immediate and/or substantial effects to its surrounding geographic location at the local or state level (Criterion A). Many of the towns located along the NWP existed prior to its incorporation, and it does not appear that the operation and system expansion of NWP during the 1910s and 1920s directly and significantly influenced the settlement of the communities along this line. Furthermore, when looking at the integrity of the system as a whole, it would appear that abandonment of large sections of the rail corridor have resulted in the demolition of numerous stations, trestles, tracks, and tunnels, resulting in diminished integrity. Furthermore, along those segments for which track, trestles and tunnels are still extant, upgrades and maintenance over the last 100 years have likely further compromised integrity of the resource as a whole.

Evaluation of NWP Trestle and Individual Segment

The 0.4-mile segment documented on this form was constructed at the same time and with similar, if not identical, methods and materials to the adjacent and segment north of the California Park Hill Railroad Tunnel, which was determined ineligible for the NRHP and CRHR in 2005. As with that segment that the potential period of significance for which the Corte Madera segment is evaluated is 1912-1913, the years when the extant tracks were built, and 1941, the year NWP shifted its southern terminal for steam passenger service to San Rafael and ended electric interurban service throughout southern Marin County. Similarly, the period of significance for the trestle would span between 1924, when it was constructed, and 1941.

This particular 0.4-mile segment of the railroad does not appear to be eligible for the NRHP or CRHR, individually or as a contributor to a historic district, because it and the trestle lack sufficient integrity to their period of significance to warrant listing in the NRHP or CRHR. Completed in 1912-1913, this track was one of two along this rail alignment (the other being the original San Francisco & San Rafael Railroad tracks constructed in 1884). By the 1920s, NWP upgraded this segment to include an electric third rail; however, both the 1884 and 1920s tracks have since been removed and a substantial portion of the rails and ties along the subject segment are no longer extant or are buried beneath a gravel parking lot constructed within the last twenty years. The concrete abutment on the north side of Sir Francis Drake Boulevard was reconstructed in the 1990s and the hillside re-graded. The trestle over Corte Madera Creek has also been altered, namely by the removal of a large section (over 165 feet in length) of the structure in 2001, which conveyed the tracks over Sir Francis Drake Boulevard, as well as additional modifications. In addition to these changes, which have compromised its integrity of materials, craftsmanship, and design of both the trestle and the 0.4-mile railroad segment, the construction of modern-day US 101 immediately west of the railroad and modern offices buildings to the east, have substantially compromised the integrity of setting, feeling, and association of these resources.

When examining the single 0.4-mile segment, or the trestle, as individual components of NWP for significance under NRHP Criterion A (CRHR Criterion 1), it does not appear to be eligible, as it does not appear to be associated with any historic events that have made a significant impact on history at the local level. This alignment, originally constructed in 1884, was one of several local railroads built in Marin County to provide transportation for both freight and local citizens to San Francisco. In this regard, the segment does not appear to be significant, as it was not the first rail line in the county nor was it built for any reason other than to provide improved transportation for freight and passengers. Furthermore, as noted above, it does not appear that any significant new settlement or economic development in the region is solely attributable to the construction of this segment of NWP. While the population of the county increased during the 1920s, there is no indication that this upward trend is directly and solely attributed to the NWP and its continued upgrading of its passenger or freight service during the 1910s and 1920s and instead, is more likely the result of the completion of the Redwood Highway, which roughly paralleled the NWP through much of Marin and Sonoma counties. Additionally, this alignment dates to 1912-1913 when NWP double-tracked the line between Detour and San Rafael as part of a general updating of resources. Thus, the extant tracks and trestle were not the first on site.

Under NRHP Criterion C (CRHR Criterion 1), neither the extant railroad segment nor its associated trestle appear to be eligible as no special engineering or construction techniques were known to be used in the construction of this rail segment or in the construction of the trestle. The trestle and adjacent bascule bridge (also constructed in 1924) were constructed to replace deteriorated and outdated single-track structures likely built by San Francisco & San Rafael Railroad line during the nineteenth century. According to NWP records in 1922, the trestle and bridge formed "the only single track section of 10 ½ miles of double track, and the train movement over the structure is heavy and rapidly increasing, it is deemed advisable to replace the trestle with a double track structure, additional pilings, shorter span and heavier members; also replace the present swing drawbridge with a double track Scherzer steel structure of the rolling lift type."[5] Construction of both structures was delayed more than two years and completed in 1924 for an approximate cost of $144,000.[6]

During its operation, NWP built eighteen trestles over 300 feet long on the main line (between Tiburon to Eureka), fifteen of which were open deck trestles. All were built between 1911 and 1955; however more than half were constructed in or after 1923. A survey conducted by Garcia and Associates of trestles along the NWP from Larkspur Landing to Cloverdale reveal that of the 55 trestles built (of all lengths using standardized plans) along that 71-mile stretch of the railroad, nearly three-quarters were open deck construction and most were supported by timber piles, just like the Corte Madera Creek trestle. Most have undergone some form of alteration, including reconstruction, widening, timber replacement, concrete reinforcing, or new tracking.[7] The trestle is one of many constructed during the twentieth century along this line utilizing standard plans, therefore it does not appear to meet NRHP Criterion C (CRHR Criterion 3).[8] Research for this project did not reveal that this railroad line has any associations with persons who gained prominence in their professions or made significant contributions in local, state, or national history. Therefore, this segment of NWP does not appear eligible under NRHP Criterion B (CRHR Criterion 2). Furthermore, built environments are rarely significant under NRHP Criterion D (CRHR Criterion 4) and this segment of rail line does not appear likely to yield important historical information. This property has been evaluated in accordance with Section 15064.5 (1)(2)-(3) of the CEQA Guidelines using the criteria outlined in Section 5024.1 of the California Resources Code.

Photographs (continued)

Photograph 2: View of trestle showing bascule bridge in background, camera facing south.

[5] Gregory King, "Evaluation of the Trestle over Sir Francis Drake Boulevard ;" Northwestern Pacific Railroad Company, "Executive Authority, No. 1383, AFE P-3611, Greenbrae: Renewal of trestle and of drawbridge over Corte Madera Creek, July 26, 1922," Northwestern Pacific Railroad Collection, MS56, Series 4, Box 8 (California State Railroad Museum Library).

[6] Northwestern Pacific Railroad Company, "Executive Authority, No. Sup. 1383, AFE No. Sup. P3011, Greenbrae: Double track trestle and drawbridge, September 2, 1924," Northwestern Pacific Railroad Collection, MS56, Series 4, Box 8.

[7] Stindt and Dunscomb, *The Northwestern Pacific Railroad, Redwood Empire Route*, 108; *Bridge Inspection Report: Northwestern Pacific* (Southern Pacific Company, 1955), 1-78; Garcia and Associates, "Historic Architectural Resources Technical Report," 32-36.

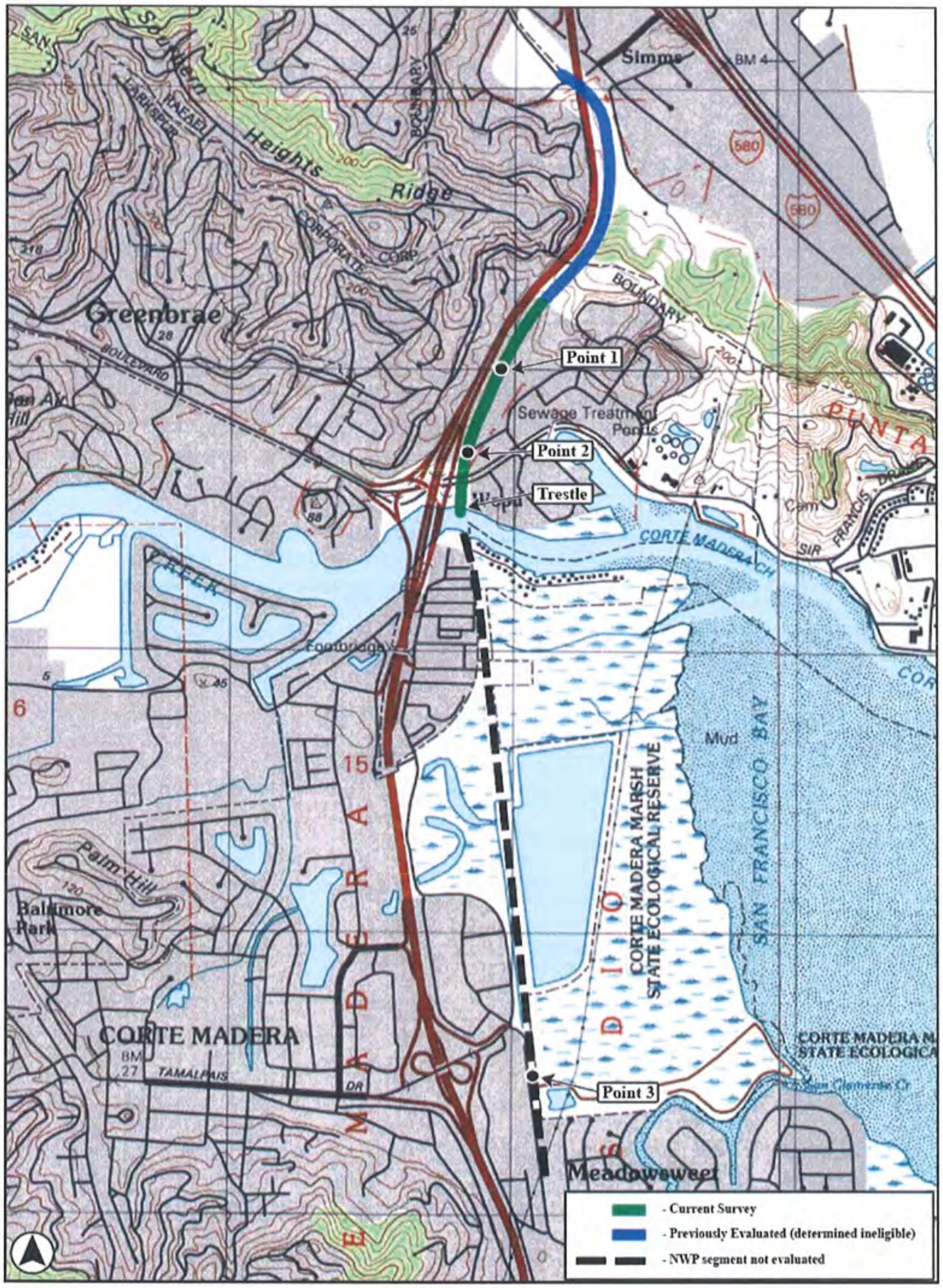
[8] Gregory King, "Evaluation of the Trestle over Sir Francis Drake Boulevard."

Photographs (continued)

Photograph 3: View of trestle showing "X" braces, camera facing southwest.

Photograph 4: View of adjacent bascule bridge and south trestle (outside of APE), camera facing east-northeast.

Sketch Map


Point 1
Point 2
Trestle
Point 3
Greenbrae
Sewage Treatment Ponds
Footbridge
CORTE MADERA
CORTE MADERA MARSH STATE ECOLOGICAL RESERVE
SAN FRANCISCO BAY
Mud
Palm Hill
Baltimore Park
Meadowsweet
Heights
Ridge
Simms
- Current Survey
- Previously Evaluated (determined ineligible)
- NWP segment not evaluated

*Resource Name or # Map Reference No. 1

L1. Historic and/or Common Name: Northwestern Pacific Railroad

L2a. Portion Described: ☐ Entire Resource Segment ☒ Point Observation **Designation:** Point 1

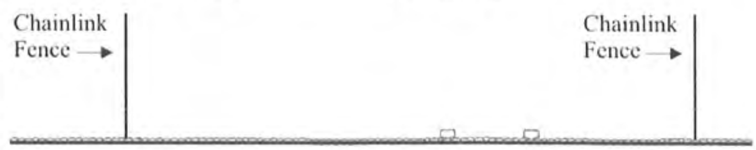
***b. Location of point or segment:**
The recordation point is located approximately 1,100 feet north of East Sir Francis Drake Boulevard and adjacent (east) to US 101.

L3. Description:
At this recordation point, the non-operational railroad is a single track, at grade level with no timber ties. The former railroad right-of-way has been converted into a graveled parking lot and enclosed by a chain-link fence.

L4. Dimensions:
- **a. Top Width** approximately 58'
- **b. Bottom Width** n/a
- **c. Height or Depth** n/a
- **d. Length of Segment** n/a

L5. Associated Resources: None

L4e. Sketch of Cross-Section **Facing:** n/a



Not to scale

L6. Setting:
The setting at this location is marked by US 101 elevated on plateau immediately west and vacant parcels to the east.

L7. Integrity Considerations: The rail line at this point does not appear to retain historic integrity because of the construction of a graveled parking lot within the railroad alignment. The parking lot (approximately 760 feet in length) has been partly enclosed by a modern chain-link fence and the tracks have been partially covered by gravel. No rail ties are evident.

L8a. Photograph, Map, or Drawing.

L8b. Description of Photo, Map, or Drawing: View of tracks at north end of parking lot, camera facing north.

L9. Remarks:

L10. Form prepared by: Toni Webb, JRP Historical Consulting, LLC 1490 Drew Ave, Suite 110, Davis, CA 95618

L11. Date: June 25, 2008

*Resource Name or # Map Reference No. 1

L1. Historic and/or Common Name: Northwestern Pacific Railroad

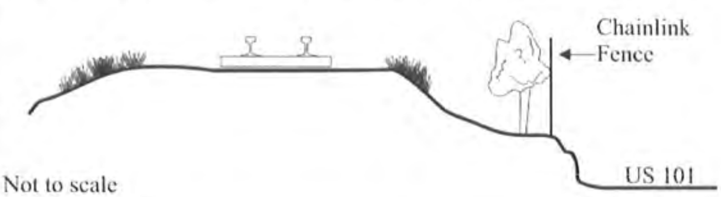
L2a. Portion Described: ☐ Entire Resource Segment ☒ Point Observation **Designation:** Point 2

***b. Location of point or segment:**
The recordation point is located immediately north of East Sir Francis Drake Boulevard and adjacent (east) to US 101.

L3. Description:
At this recordation point, the non-operational railroad is a single track with pressure-treated wood ties raised approximately 15 feet above grade.

L4. Dimensions:
- a. **Top Width** approximately 12'
- b. **Bottom Width** n/a
- c. **Height or Depth** approximately 15'
- d. **Length of Segment** n/a

L4e. Sketch of Cross-Section (include scale) **Facing:** south



L5. Associated Resources: None

L6. Setting:
The setting at this point is marked by an onramp to US 101 immediately west and modern commercial buildings on parcels to the east.

L7. Integrity Considerations:
The historic integrity of the rail line at this point has been compromised by the removal of the trestle over Sir Francis Drake Boulevard, which was once attached to the tracks at this point, as well as the construction of a graveled parking lot (just north) within the railroad alignment, present-day US 101 to the west and modern office buildings to the east.

L8a. Photograph, Map, or Drawing.

L8b. Description of Photo, Map, or Drawing: View of tracks just north of Sir Francis Drake Boulevard, camera facing north.

L9. Remarks:

L10. Form prepared by: Toni Webb, JRP Historical Consulting, LLC 1490 Drew Ave, Suite 110, Davis, CA 95618

L11. Date: June 25, 2008

L1. Historic and/or Common Name: Northwestern Pacific Railroad

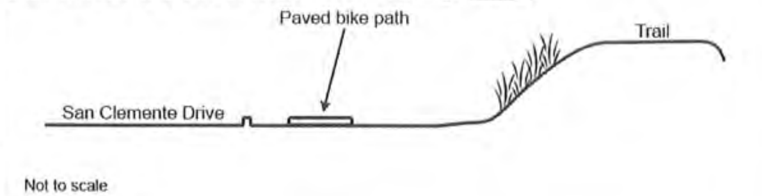
L2a. Portion Described: ☐ Entire Resource Segment ☒ Point Observation **Designation:** Point 3

***b. Location of point or segment:**
The recordation point is located just east of the intersection of Tamalpias and San Clemente drives (1.2 miles south of Sir Francis Drake Boulevard).

L3. Description:
At this recordation point, the former rail alignment has been replaced by modern construction. All rails, ties, ballast, and associated railroad features have been removed.

L4. Dimensions:
- a. **Top Width** n/a
- b. **Bottom Width** n/a
- c. **Height or Depth** n/a
- d. **Length of Segment** n/a

L4e. Sketch of Cross-Section **Facing:** north



L5. Associated Resources: None

L6. Setting:
The setting at this location is marked by modern road and commercial construction.

L7. Integrity Considerations: The rail line at this point does not appear to retain historic integrity because all tracks, ballast and other associated features have been removed.

L8a. Photograph, Map, or Drawing.

L8b. Description of Photo, Map, or Drawing: View of facing north.

L9. Remarks:

L10. Form prepared by: Toni Webb, JRP Historical Consulting, LLC 2850 Spafford Street Davis, CA 95618

L11. Date: December 2010

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI#
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 of 4 5 ***Resource Name or #: (Assigned by recorder)** Northwest Pacific Railroad Segment 1 (3/19) and Segment 2 (5/3)

P1. Other Identifier:

***P2. Location:** ☐Not for Publication ☒ Unrestricted *a. County Marin

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Petaluma River and Novato **Date** 1954, Photorevised 1980 **T3N R7W**; SE ¼ of NE ¼ **of Sec. (unsectioned)** ; MDM

c. Address **City** Novato **Zip**

d. UTM: (Give more than one for large and/or linear resources) **Zone** 10 ; 538020 **mE/** 4218791 **mN** NAD 83

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) The first segment is reached via Highway 101(northbound) Atherton Ave exit. Turn left onto Atherton Ave and proceed 0.16 of a mile. (Continued)

***P3a. Description:** (Describe resource and its major elements. Include design, materials condition, alterations, size, setting and boundaries)
Two locations on the Northwest Pacific Railroad were recorded. Both segments only represent a small portion of the Northwest Pacific Railroad line. Segment 1 (3/19) and Segment 2 (5/3) are confined to the 100-foot (ft.)-radius APE around transmission pole 19/3 and 5/3 on the Lakeville #2 60 kV transmission line. The recorded segment primarily consists of gravel rail bed 15 ft. wide with rail tracks 5.3 ft. wide and ties extending along the rail bed. (continued)

***P3b. Resource Attributes: (List attributes and codes)**

***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures and objects.)

P5b. Description of Photo: (View, date, accession #) Photo # 08-8015-164-D-9233. October 16, 2008. View facing north of recorded segment 1.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
Owner: Unknown

***P8. Recorded by: (Name, affiliation and address)** B. Harris
Par Environmental Services
1906 21ST Street, Sacramento, CA

***P9. Date Recorded:** 10/16/08

***P10. Survey Type: (Describe)**
Constraints Analysis (preliminary) cultural resources inventory
cultural resources inventory

***P11. Report Citation: (Cite survey report and other sources, or enter "None")**
PAR Environmental Services, Inc. 2008 *Cultural Resources Constraints Study for the Replacement of 12 Poles on the Lakeville #2 60 kV transmission Line.* On file, Pacific Gas and Electric Company, San Ramon.

***Attachments:** ☐NONE ☒ Location Map ☐ Sketch 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)

DEC 2 2 2008

P2e Other Locational Data (continued)

Turn left onto Redwood Blvd. A short distance down this road (0.15 miles), turn left onto Rush Creek Place. The recorded segment of the railroad falls within the 100-foot APE radius of Lakeville #2 transmission pole 3/19. Segment 2 is reached via Highway 101(northbound) Atherton Ave exit. At off-ramp take a right onto Atherton Ave and head east for 0.07 of a mile. Turn left onto Binford Road and proceed for 1.6 miles. At this point take a dirt track leading west, just beyond a storage facility and follow the road around as it turns south for 0.2 of a mile to pole 5/3. The recorded segment of the railroad falls within the PG&E specified 100 foot APE radius of Lakeville #2 transmission pole 5/3.

UTM points Segment 1: 538020 mE 4218791 mN
UTM points Segment 2: 538237 mE 4221172 mN

Recorded segments 1 and 2 fall within unsectioned portions of Petaluma and Novato USGS topographic maps.

P3a Description (continued)

Attached railroad hardware such as rails, ties, nuts bolts, spikes, and rail connectors are still present at both recorded segments of the railroad. Twenty-five ft. to the southwest in the recorded portion of Segment 1 is a railroad crossing with signals and barriers. The recorded portion of Segment 2 rail tracks has the years 1955 and 1952 stamped on them, as well as manufacturing identification numbers.

Photo # 08-8015-164-D9230. October 16 2008. Northwest Pacific Railroad Segment 2 (5/3), facing north.

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State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # ~~P-21-002618~~
HRI#
Trinomial

*Resource Name or #: (Assigned by recorder) Northwest Pacific Railroad Segment 1 (3/19) and Segment 2 (5/3)

*Recorded by: B. Harris *Date 10/16/08 ☒Continuation ☐Update

Photo # 08-8015-164-D9226. October 16 2008. View facing east of segment 2. Stamped date 1955 and spike.

Photo # 08-8015-164-D9227. October 16, 2008. View facing east of segment 2. Stamped date 1952 and rail spike.

Photo # 08-8015-164-D9229. October 16 2008. View facing east.

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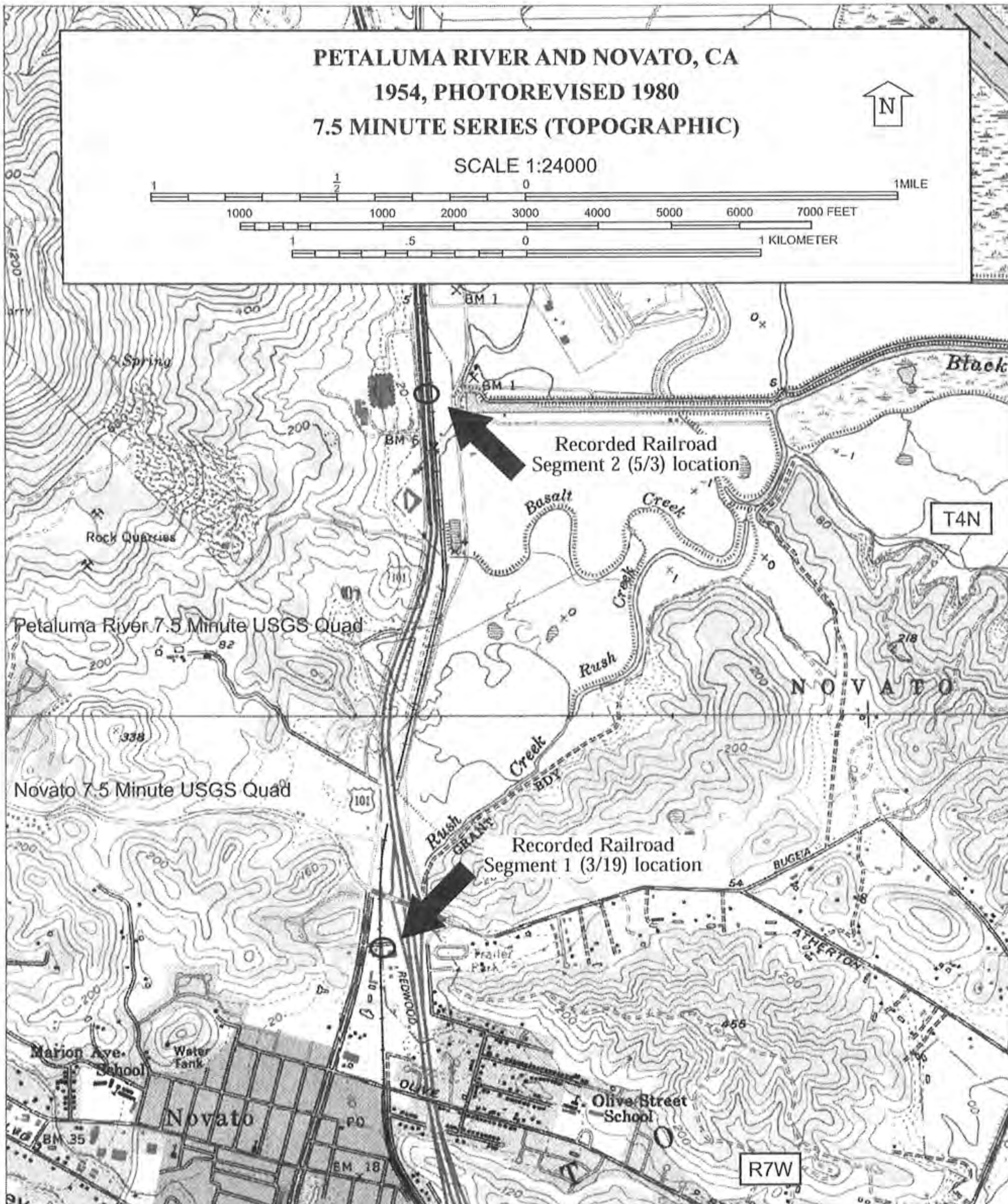
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-21-002618
HRI #
Trinomial

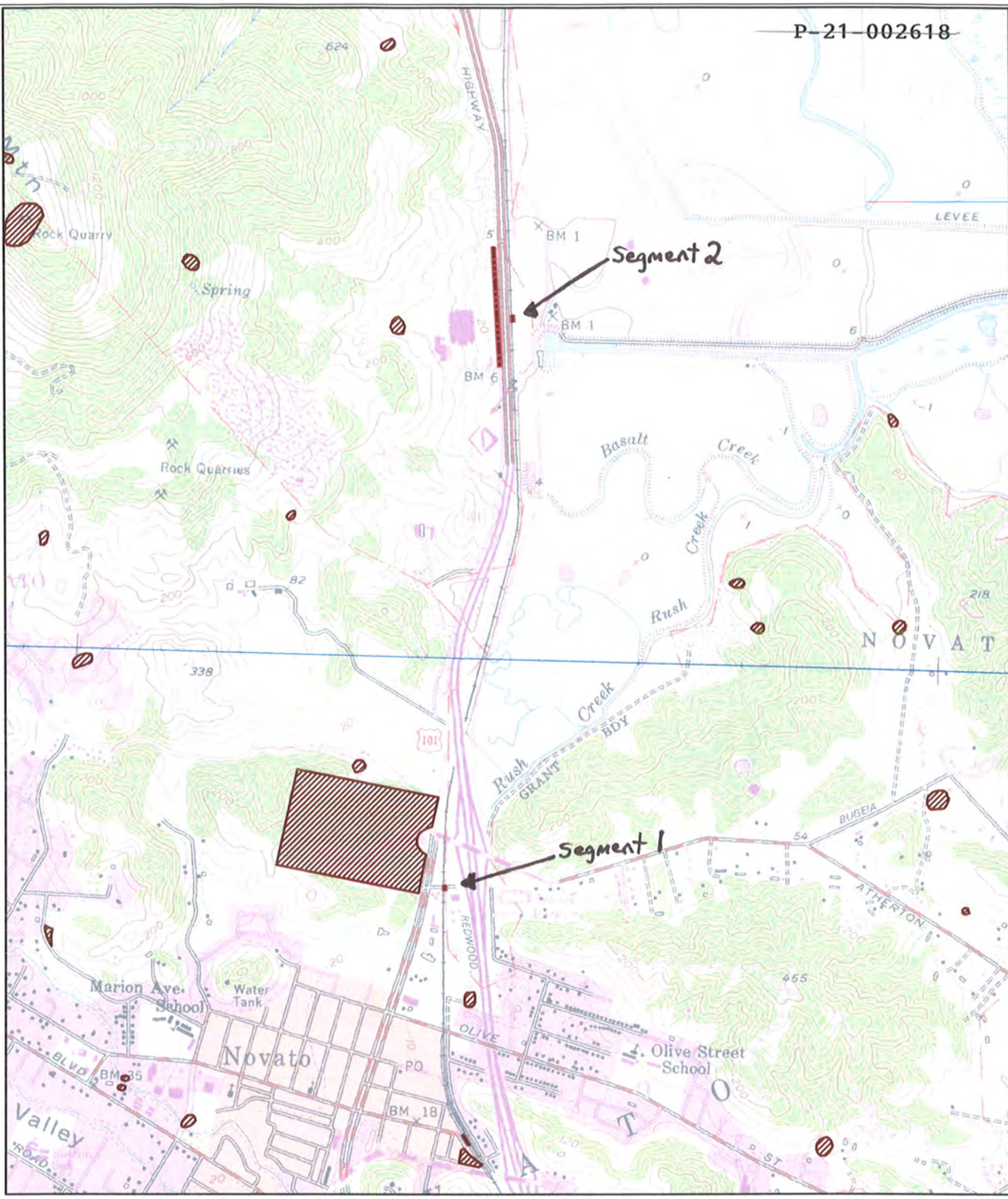
Page 4 of 45 * Resource Name or # (Assigned by recorder) Northwest Pacific Railroad Segment 1 (3/19) and 2 (5/3)

*Map Name: Petaluma River and Novato, CA 7.5-min Quadrangles *Scale 1:24,000 * Date of map: 1954, Photorevised 1980



DPR 523J(1/95) *Required Information

P-21-002618



Northwest Information Center
May depict confidential cultural resource locations.
Do not distribute.

Miles
00.0408
0 0.2 0.4
Kilometers

N

1:24000 scale

Legend
- Resource points
- Resource lines
- Resource polygons
- Districts

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # ~~P-21-002618~~
HRI #
Trinomial **CA-MRN-699H**
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

 ***Resource Name or #:** Northwestern Pacific Railroad

P1. Other Identifier:

***P2. Location:** ☒ Not for Publication ☐ Unrestricted and ***a. County** Marin (4844)

***b. USGS 7.5' Quad** Novato **Date** 1954 (pr 1980) **T** 3N; **R** 6W; ¼ of ¼ of Sec ; San Jose (Pacheco) land grant **B.M.**

c. Address City Zip

d. UTM: Zone 10; 539725 mE/ 4215335 mN

e. Other Locational Data: The feature runs parallel to Highway 101 southeast of Novato; this segment is located near the intersection of Highways 37 and 101.

***P3a. Description:**

This resource is a segment of the Northwestern Pacific Railroadline. Which runs from Larkspur to Eureka (Northwestern Pacific Railroad Historical Society 2006). This segment consists of metal rails over wooden ties on top of an earthern berm with a marsh to the east and foothills to the west. The railroad tracks, which are oriented north-south, appear on the 1914 USGS Novato topographical quadrangle and were present in 1907 (NWPRRHS 2006). The tracks run parallel to, and crosses, a levee and ditch system (P-21-002586).

Northwestern Pacific Railroad Historical Society (NWPRRHS)
2006 NWP Railroad History. Northwestern Pacific Railroad Historical Society, Santa Rosa, California. Web site at http://www.nwprrhs.org/ (accessed 23 June 2006).

***P3b. Resource Attributes:** HP 11. Engineering Structure: railroad tracks.

***P4. Resources Present:** ☐Building ☒Structure ☐Object ☐Site ☐District ☐Element of District Other (Isolates, etc.)

P5b. Description of Photo:
View of railroad tracks facing northwest.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
Sonoma-Marin Area Rail Transit
Lucrecia Milla, Property Manager
404 Civic Center Drive
San Rafael, CA 94903

***P8. Recorded by:**
Melissa Gallagher
Anthropological Studies Center
1801 E. Cotati Ave., Blg. 29
Rohnert Park, CA 94928

***P9. Date Recorded:** 16 June 2006

***P10. Survey Type:** intensive surface survey

***P11. Report Citation:** Melissa Gallagher. 2006. *A Cultural Resources Survey of the Novato Sanitary District Main Realignment Novato, Marin County, California*. Anthropological Studies Center, Rohnert Park, California. Prepared for Winzler & Kelly Consulting Engineers, Santa Rosa, California.

***Attachments:** ☐NONE ☒Location Map ☐Sketch 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)

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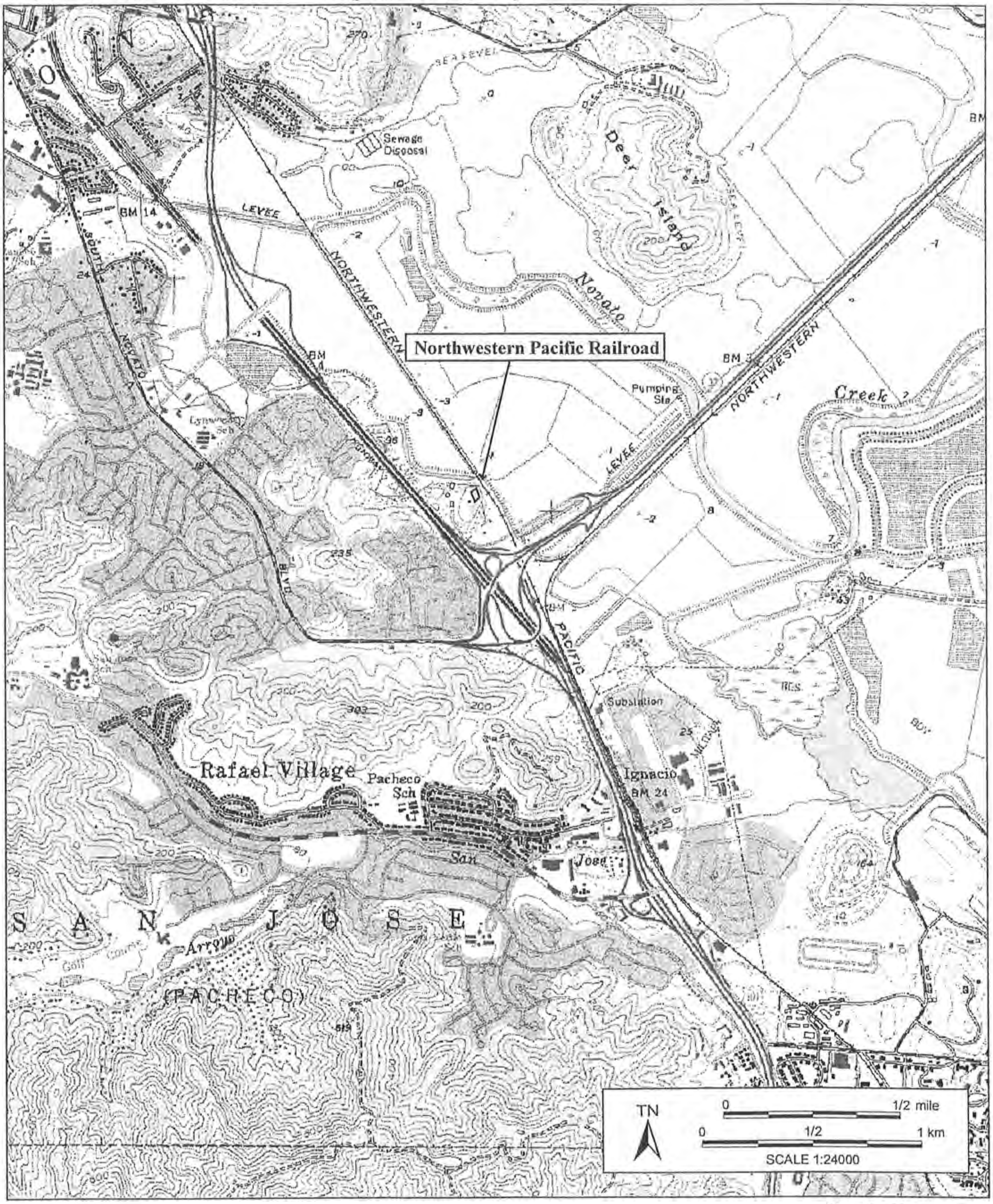
State of California — The Resource Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P-21-002618
HRI#
Trinomial

Page 2 of 2 *Resource Name or # Northwestern Pacific Railroad

*Map Name: USGS 7.5' Novato , Calif. 1954 (photorevised in 1980) *Scale: 1:24000 *Date of Map: 23 June 2006



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #: P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code:
Other Listings
Review Code ____ Reviewer ________ Date ______

***Resource Name or #:** Northwestern Pacific Railroad
Map Reference No.: 19

P1. Other Identifier:

***P2. Location:** ☐ Not for Publication ■ Unrestricted ***a. County** Marin and Sonoma

***b. USGS 7.5' Quad** Novato **Date** 1954 (rev. 1980)
Petaluma River 1954 (rev. 1968)
Petaluma 1953 (rev. 1981)
Cotati 1954 (rev. 1980)

c. Address N/A **City** **Zip**
***d. UTM:**
***e. Other Locational Data:**

***P3a. Description:**
The Northwestern Pacific Railroad consists of standard rails, ties, and rock ballast. The ties show some deterioration and the rails are rusted from disuse, with weeds and tall grass growing in the right-of-way. (See Continuation Sheet, page 3.)

***P3b. Resource Attributes:** HP39 – Railroad
***P4. Resources Present:** ☐ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other


Railroad crossing under De Long Avenue in Novato.

P5b. Description of Photo: View southeast. November 4, 2004.

***P6. Date Constructed/Age and Sources:** ■Historic
Various dates, see item B10.

***P7. Owner and Address:**
North Coast Railroad Authority
4 West Second Street
Eureka, CA 95501

***P8. Recorded by:**
Andrew Hope, Caltrans
1120 N Street
Sacramento, CA 95814
(916) 654-5611

***P9. Date Recorded:** Nov. 2004
***P10. Type of Survey:** Intensive

***P11. Report Citation:** *Historic Resource Evaluation Report for the Marin-Sonoma Narrows Project.* Andrew Hope, Caltrans. May 2005. [Mrn-101, p.m. 18.3 / 27.7; Son-101, p.m. 0.0 / 7.5; EA 264000]

***Attachments:** ■ Building, Structure, and Object Record ■ Continuation Sheets ■ Location Maps

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***NRHP Status Code:**
***Resource Name or #:** Northwestern Pacific Railroad

B1. Historic Name: San Francisco & Northern Pacific Railroad; Northwestern Pacific Railroad
B2. Common Name: Northwestern Pacific Railroad
B3. Original Use: Railroad **B4. Present Use:** None
***B5. Architectural Style:** N/A
***B6. Construction History:**

The railroad was organized in 1869 and was expanded from that date to 1914. The right-of-way in the Novato-Petaluma area was established in the 1870s, but the present materials (rails, ties, ballast, signals, etc.) are modern, due to their replacement as part of ongoing maintenance during the years of the railroad's operation.

***B7. Moved?** ■ No ☐ Yes ☐ Unknown **Date:** **Original Location:**
***B8. Related Features:**

There are depots and other buildings associated with the railroad along its entire length, including depots in Novato and Petaluma.

B9a. Architect: Unknown **b. Builder:** Northwestern Pacific Railroad
***B10. Significance: Theme:** **Area:**
Period of Significance: **Property Type:** **Applicable Criteria:**

History of the railroad

The Northwestern Pacific Railroad began as the San Francisco and Northern Pacific, which was organized in 1869. By laying new track and acquiring existing short lines, this railroad expanded from Marin to Sonoma counties during the 1870s, connecting Petaluma and Santa Rosa to ferry and port facilities in

(See Continuation Sheet, page 3.)

B11. Additional Resource Attributes:
***B12. References:**

Hope, Andrew. *Historic Resource Evaluation Report for the Hopland Bypass freeway project in Mendocino County.* (01-Men-101, p.m. 9.2 / 17.6) Sacramento: California Department of Transportation, 2004.

Lortie, Frank. *Historic Architectural Survey Report for Alternatives C1, E3, J1, L, and TSM, Willits Bypass.* (01-Men-101, p.m. 43.5 / 51.3) Sacramento: California Department of Transportation, 2000.

Mikesell, Stephen. *Historical Resources Evaluation Report, Northwestern Pacific Railroad Tracks.* (4-Mrn-101, p.m. 8.4 / 12.7) Sacramento: California Department of Transportation, 1989.

(Sketch Map with north arrow required.)

B13. Remarks:

B14. Evaluator: Andrew Hope, Caltrans

Date of Evaluation: November 2004

(This space reserved for official comments.)

***P3a. Description (continued from page 1):**

The tracks pass through the APE for the Novato Narrows project at six locations in Marin County and two in Sonoma County, as shown on the project APE map and listed below:

<u>Marin County</u>

1) At the Hwy. 101 / Hwy. 37 interchange (APE map sheet A-1)
2) At the Hwy. 101 overcrossing south of the De Long Avenue interchange (APE map sheet A-3)
3) At De Long Avenue (APE map sheet A-4)
4) At Atherton Avenue (APE map sheet A-4)
5) At the Hwy. 101 overcrossing north of the Atherton Avenue interchange (APE map sheet A-5)
6) In the vicinity of Airport Road (APE map sheets B-1 to B-3)

<u>Sonoma County</u>

7) At the Hwy. 101 overcrossing south of the Lakeville Hwy. interchange (APE map sheet C-1)
8) At the Hwy. 101 overcrossing on the north side of Petaluma (APE map sheet C-3)

All of these are locations where Highway 101 or local roads cross over the railroad, except for location 6, where the railroad runs alongside the highway for slightly more than one mile.

There are no buildings, bridges, or other railroad facilities, other than the tracks, within the APE for the Novato Narrows project. However, within the entire railroad corridor from Novato to Petaluma, there are depot buildings in the two cities and a largely burned and ruined freight building adjacent to the Novato depot. There is also a metal truss swing bridge where the railroad crosses the Petaluma River.

***B10. Significance (continued from page 2):**

Sausalito and Tiburon. Continuing its northward expansion, the railroad reached Ukiah in 1889 and Willits in 1902. As the railroad extended its reach into the North Coast counties, it facilitated the transport of agricultural products and natural resources (particularly redwood lumber), brought increased settlement in the towns and cities along the route, and stimulated the growth of tourism.

The railroad was reorganized in 1907, when the line was acquired and operated as a joint venture by the Southern Pacific and Santa Fe railroads. It was at this time that the name was changed to Northwestern Pacific (NWP). With the new ownership and infusion of capital, the line was extended north from Willits, reaching Eureka in 1914. Southern Pacific bought the Santa Fe's share of the NWP in 1929, and the railroad continued to operate until 1998.

<u>Previous evaluations</u>

Several components of the NWP have previously been evaluated, although none of these evaluations include the portions within the APE for the Novato Narrows project.

A segment of the NWP in the Marin County community of San Rafael, approximately ¾ of a mile long, was evaluated in 1989 by Steve Mikesell (then of Caltrans). This segment included a 1910 culvert and other components dating from the 1940s to 1989. Mikesell's evaluation concluded that the railroad segment was ineligible for National Register listing, noting that its integrity of design, materials, workmanship, and setting were lost.

Other elements of the railroad, in the Mendocino County community of Willits, were evaluated by Frank Lortie of Caltrans in 2000, for the Willits bypass project. Mr. Lortie's evaluation concluded that the various railroad segments, along with the depot, several other buildings, and three timber trestles are all

(See Continuation Sheet, page 4.)

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***B10. Significance (continued from page 3):**

eligible for National Register listing as components of a single property. The property was considered to be significant under Criterion A, for its importance in the development of the North Coast counties, and particularly the redwood lumber industry.

A portion of the railroad was evaluated by Andrew Hope in 2004, for the Hopland Bypass project in Mendocino County. Mr. Hope's evaluation concluded that the Hopland depot and an associated segment of the railroad are eligible for National Register listing. The State Historic Preservation Officer (SHPO) has not yet reviewed the Historic Resource Evaluation Report for the Hopland Bypass project, and has therefore not yet concurred in the eligibility of the railroad segment.

In addition to these evaluations by Caltrans, a portion of the railroad in Petaluma was evaluated by the Army Corps of Engineers in 1995 and determined ineligible for National Register listing. Numerous other properties associated with the NWP in Marin, Sonoma, Mendocino, and Humboldt Counties, including depots, other buildings, bridges, and trestles, have been listed on the National Register or determined eligible for listing. In general, segments of the railroad itself that have been determined eligible have a close association with historic depots, while segments which have no associated depots or other buildings have been determined ineligible.

Evaluation of the Novato-Petaluma segment

The significance of the NWP was established in Lortie's evaluation for the Willits Bypass project, with a period of significance extending to the mid-twentieth century. The railroad clearly played a significant role in the economic development, transportation, and tourism of the many communities that it passes through. This evaluation therefore concentrates on the issue of integrity.

The railroad passes through the APE for the Novato Narrows project at eight separate locations. Individually, each of these locations includes only a short segment of the railroad, and consists of too little of the entire property to convey its historical significance. For the purpose of the Novato Narrows project, the railroad could also be considered as a continuous linear property, from the interchange of highways 101 and 37 to the north side of Petaluma, a distance of approximately 15 miles. This railroad was in operation into the 1990s, and routine maintenance has included the periodic replacement and upgrading of rails, ties, signals, crossing guards, and other features. Consequently there is little or no actual historic material remaining. However, since many of these materials have been replaced "in kind," and the railroad retains its historic appearance, it might be considered to possess sufficient integrity for National Register listing if its integrity of setting has been retained.

In the Novato area and on the north side of Petaluma, suburban growth within the last fifty years has severely diminished the railroad's integrity of setting. The numerous modern buildings adjacent to the railroad, examples of which are shown on page 6, compromise the property's integrity of setting and feeling. Integrity of setting is also diminished by the modern construction of several freeway and local road overpasses, as shown in the photos on page 5. Taken as a whole, the Novato to Petaluma segment of the NWP does not possess sufficient integrity for National Register listing, and is not considered an historical resource for the purpose of compliance with CEQA.

Within the 15-mile railroad segment considered here, there may be shorter, eligible segments that are closely associated with the depots in Novato and Petaluma, and may be contributors to these historically and architecturally significant buildings (see photos on pages 7 and 8). In addition, the metal truss bridge over the Petaluma River might be individually significant under Criterion C (see photo on page 8). However, any such contributing segments would be outside of the APE for the Novato Narrows project, as is the Petaluma River bridge.

**Railroad crossing under Highway 101, north of Atherton Avenue, Novato.
View north-northeast. November 4, 2004.**

**View southeast toward the Highway 101 overcrossing, north of Petaluma.
November 4, 2004.**

*** Resource Identifier:** Northwestern Pacific Railroad

*** Recorded by:** Andrew Hope, Caltrans *** Date:** November 2004 ■ Continuation ☐ Update

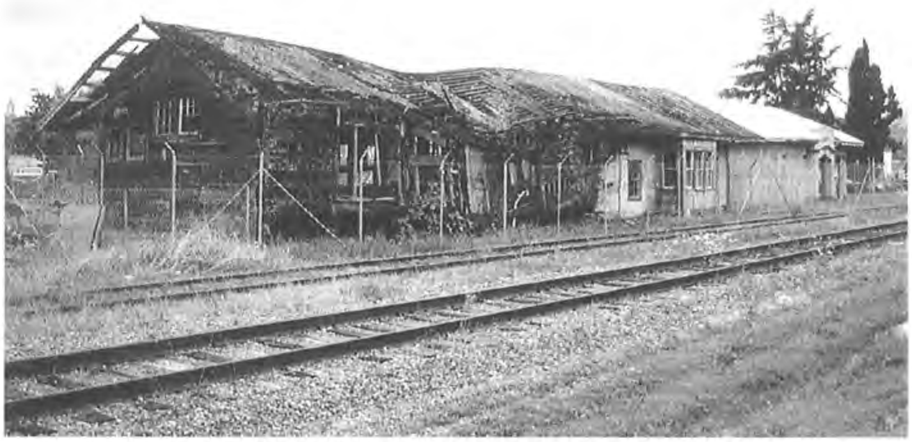
Railroad crossing Rush Creek Place, Novato, with the Atherton Avenue overcrossing in the distance (outside of the project APE). View north. November 4, 2004.

View north-northeast, north of the Atherton Avenue interchange (outside of the project APE). November 4, 2004.

*** Resource Identifier:** Northwestern Pacific Railroad

*** Recorded by:** Andrew Hope, Caltrans *** Date:** November 2004 ■ Continuation ☐ Update

Novato depot (outside of the project APE). View southwest. November 4, 2004.



**Novato freight building (outside of the project APE).
View northwest. November 4, 2004.**

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State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #: **P-21-002618**
HRI #

*** Resource Identifier:** Northwestern Pacific Railroad

*** Recorded by:** Andrew Hope, Caltrans *** Date:** November 2004 ■ Continuation ☐ Update

Petaluma depot (outside of the project APE). View west. November 4, 2004.

**Railroad bridge at the Petaluma River (outside of the project APE).
View northeast. November 4, 2004.**

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code ______ Reviewer ____________ Date

 *Resource Identifier (Assigned by recorder): Footing 10, 11, 12

P1. **Other Identifier:**

*P2. **Location:** ☒Not for Publication ☐Unrestricted ☐a. **County:** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. **USGS 7.5' Quad:** Novato **Date:** 1954 pr 1980 **T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section** (San Jose Pacheco Rancho)
c. **Address** **City** **Zip**
d. **UTM: Zone 10, 541804mE/ 4212069mN**

e. **Other Locational Data:** From Hwy 101 north, take the exit for Hamilton Field. Follow Main Gate Road to the point that it crosses the railroad tracks (approximately 1/3 mile). Follow the railroad tracks north approximately 800 feet. The footings will be on the west side of the tracks near an embankment.

*P3a. **Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):** Footing 10 consists of a concrete footing with a metal band on top. The concrete was painted white at one point. The footing measures approximately 18 x 20 inches and is 24 inches tall. The metal band is two inches wide and eight inches long. It is approximately 30 feet west of the tracks set in an embankment. It appears to be in situ. An additional concrete block fragment is located below the footing but may have slid down the embankment. It does not appear to be in situ. Footing 11 is 30 feet north of Footing 10. Footing 11 measures 18x18 inches and is 24 inches tall. It has twisted metal bands protruding from the top of it. It is set in an embankment immediately adjacent to Footing 12. Footing 12 measures 18x18 inches and is 24 inches tall. It is set in an embankment and is partially covered by the bank.

*P3b. **Resources Attributes: (list attributes and codes) : AH2** Foundations/structure pads

*P4. **Resources Present:** ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a.

*P5b. **Description of Photo:** Footing 10, View to west, 1/16/04

*P6. **Date Constructed/Age and Source:**
☐ Prehistoric ☒ Historic ☐ Both

*P7. **Owner and Address:**
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

*P8. **Recorded by (Name, affiliation, and address):**
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

*P9. **Date Recorded: 2/6/04**

*P10. **Type of Survey: Describe:** intensive pedestrian

*P11. **Report Citation (Cite survey report and other sources, or enter "none."):**
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☐ Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

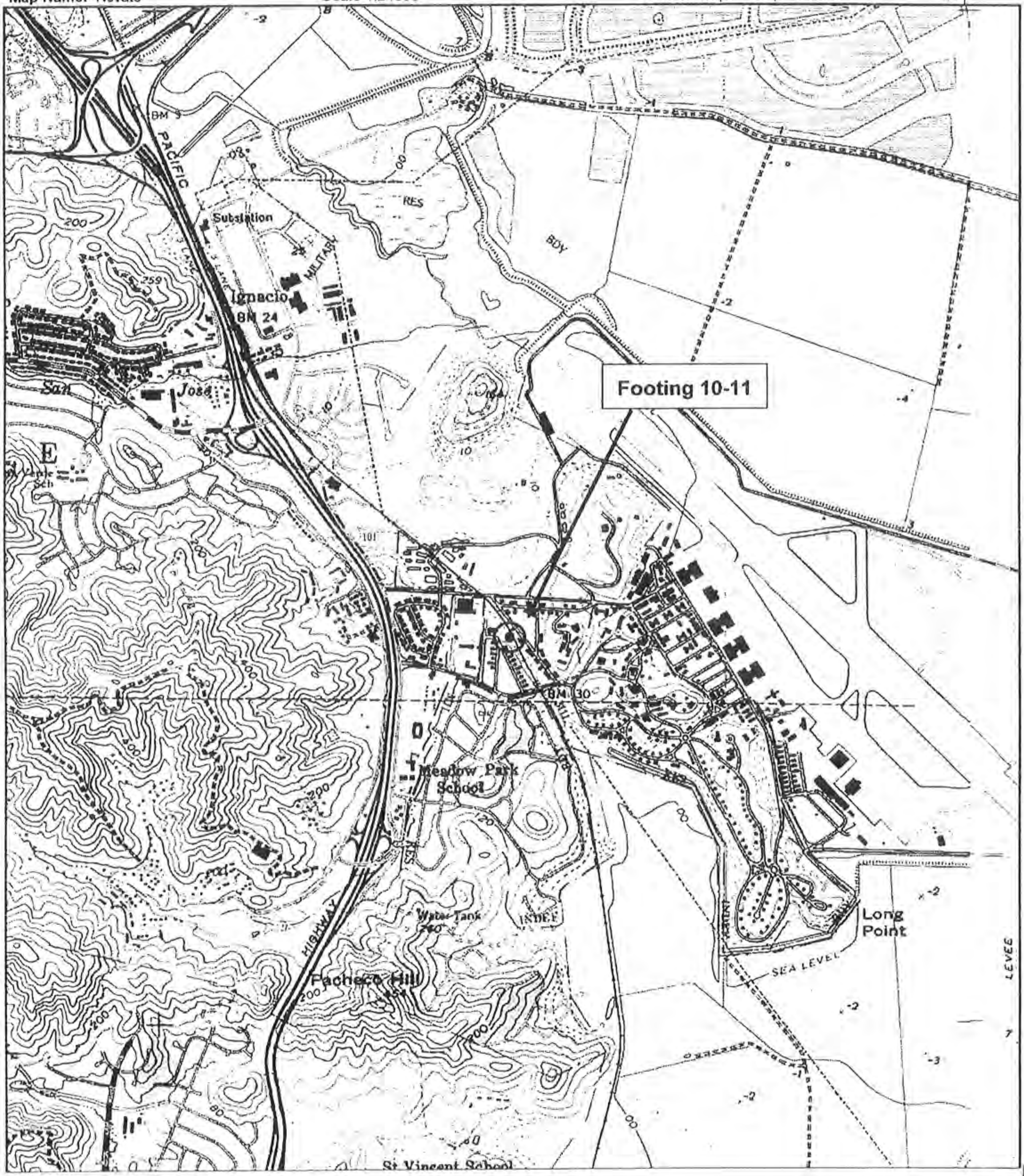
LOCATION MAP

Primary # P-21-002618
HRI #

Trinomial

*Resource Name or #: Footing 10-11-12

*Map Name: Novato *Scale 1:24000 *Date of Map: 1954, PR 1980 N

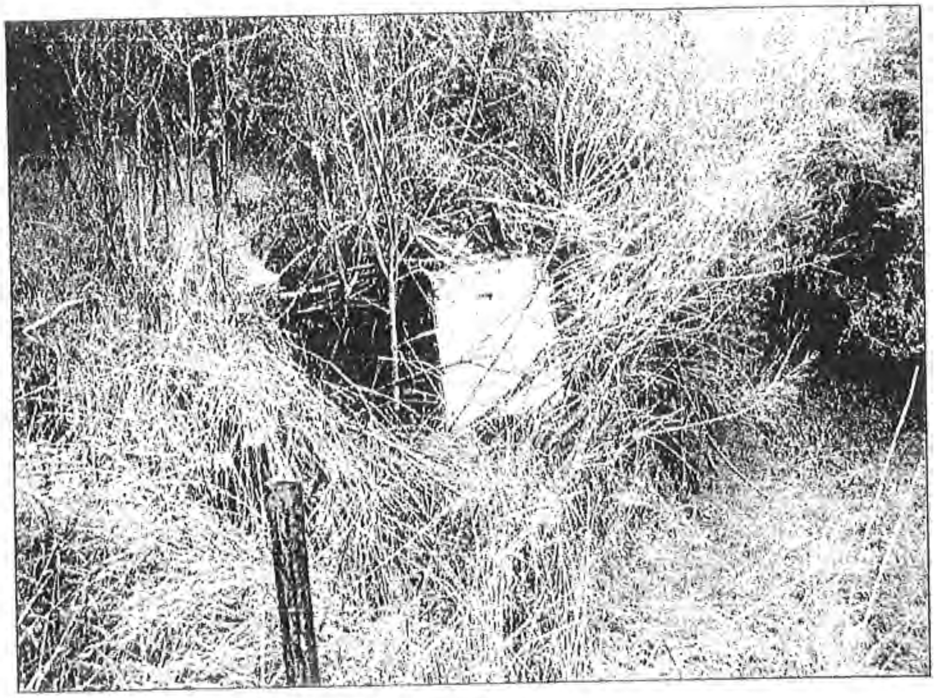


State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

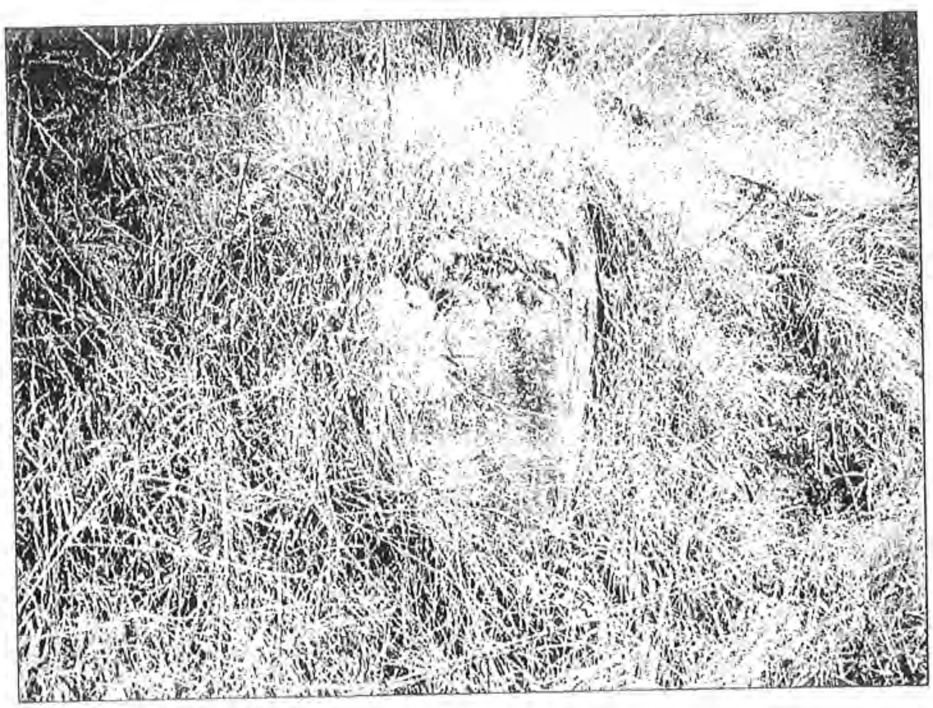
Primary # P-21-002618
HRI #

Trinomial

*Resource Name or # (Assigned by recorder) Footing 11, 12
*Recorded by: Daniel Hart, Garcia and Associates *Date: 2/6/04 ☒ Continuation ☐ Update



Footing 11



Footing 12

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code Reviewer Date

*Resource Identifier (Assigned by recorder): Footing 09

P1. Other Identifier:

*P2. Location: ☒Not for Publication ☐Unrestricted ☐a. County: Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Novato Date: 1954 pr 1980 T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section (San Jose Pacheco Rancho)
c. Address City Zip
d. UTM: Zone 10, 542152mE/4211296mN

e. Other Locational Data: From 101North, take the Hamilton Air Force Base Main Gate exit. Follow Main Gate Road .5 miles until it crosses the railroad tracks. From the tracks head south .5 miles to the footing.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries): Footing 09 is a deteriorating concrete footing. It measures approximately 16 x 16 inches. It extends approximately 8-10 inches above the ground surface. Four bolts extend upright out of the corners of the footing. The two corners closest to the tracks are deteriorating. The footing was painted white at one time. It rests approximately 6 feet west of the railroad tracks. This footing is associated with the railroad, but the function is unknown.

*P3b. Resources Attributes: (list attributes and codes) : AH2 Foundations/structure pads

*P4. Resources Present: ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a.

*P5b. Description of Photo: Footing 09, view to west, 2/6/04

*P6. Date Constructed/Age and Source: ☐ Prehistoric ☒ Historic ☐ Both

*P7. Owner and Address:
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

*P8. Recorded by (Name, affiliation, and address):
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

*P9. Date Recorded: 2/6/04

*P10. Type of Survey: Describe: intensive pedestrian

*P11. Report Citation (Cite survey report and other sources, or enter "none."):
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

k

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-21-002618
HRI #

LOCATION MAP

Trinomial

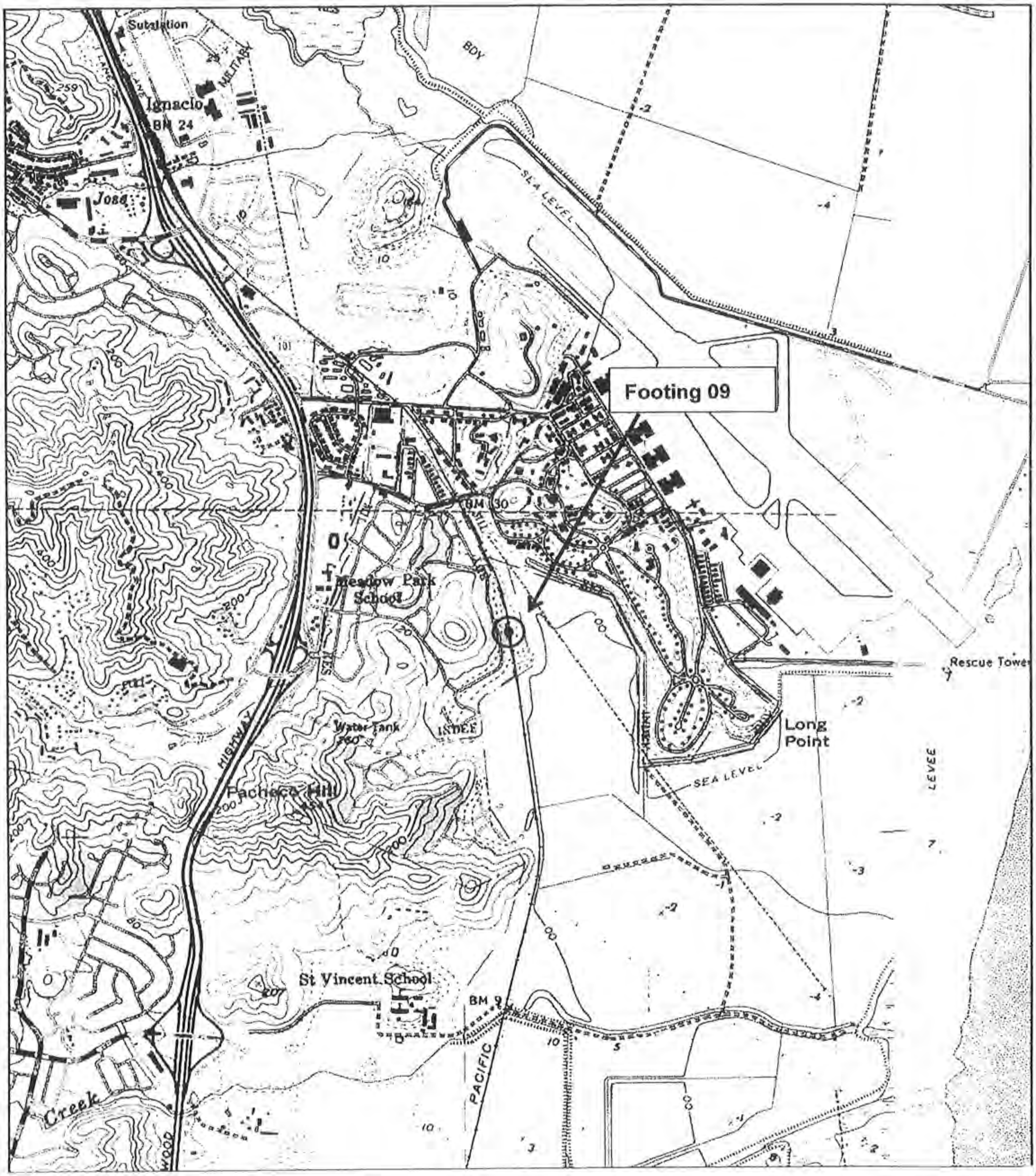
*Resource Name or #: Footing 09

*Map Name: Novato

*Scale 1:24000

*Date of Map: 1954, PR 1980

N↑



*Required Information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code ______ Reviewer ________________ Date

 *Resource Identifier (Assigned by recorder): Footing 07 and 08

P1. Other Identifier: --

*P2. Location: ☒Not for Publication ☐Unrestricted ☐a. County: Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Novato Date: 1954 pr 1980 T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section (San Jose Pacheco Rancho)
c. Address City Zip
d. UTM: Zone 10, 542279 mE/ 4210189mN

e. Other Locational Data: From Hwy 101 North, take the Miller Road exit and proceed to St. Vincent's school. Follow a dirt access road to the railroad tracks (where they cross Miller Creek). Follow the tracks north approximately ½ mile to the footings. There is one on each side of the tracks.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):
Footing 07 and 08 are square concrete footings. Footing 07 consists of two adjoining footings; one small and one larger. The larger footing measures approximately 16 x 16 inches. Approximately 3 inches extends above the ground surface. Four bolts extend upright out of the corners of the footing. The smaller adjoining footing is rectangular and has an upright metal fixture bolted to it. There is a hole on either side of the fixture where some apparatus was attached. The footing rests approximately 5 feet west of the railroad tracks. Footing 08 measures approximately 16 x 16 inches. Currently it is partially buried by dirt and weeds. Four bolts extend upright out of the corners of the footing. These footings are associated with the railroad, but their function is unknown.

*P3b. Resources Attributes: (list attributes and codes) : AH2 Foundations/structure pads

*P4. Resources Present: ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a.

*P5b. Description of Photo: Footing 07, View to west, 2/6/04

*P6. Date Constructed/Age and Source: ☐ Prehistoric ☒ Historic ☐ Both

*P7. Owner and Address:
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

*P8. Recorded by (Name, affiliation, and address):
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

*P9. Date Recorded: 2/6/04

*P10. Type of Survey: Describe: intensive pedestrian

*P11. Report Citation (Cite survey report and other sources, or enter "none."):
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

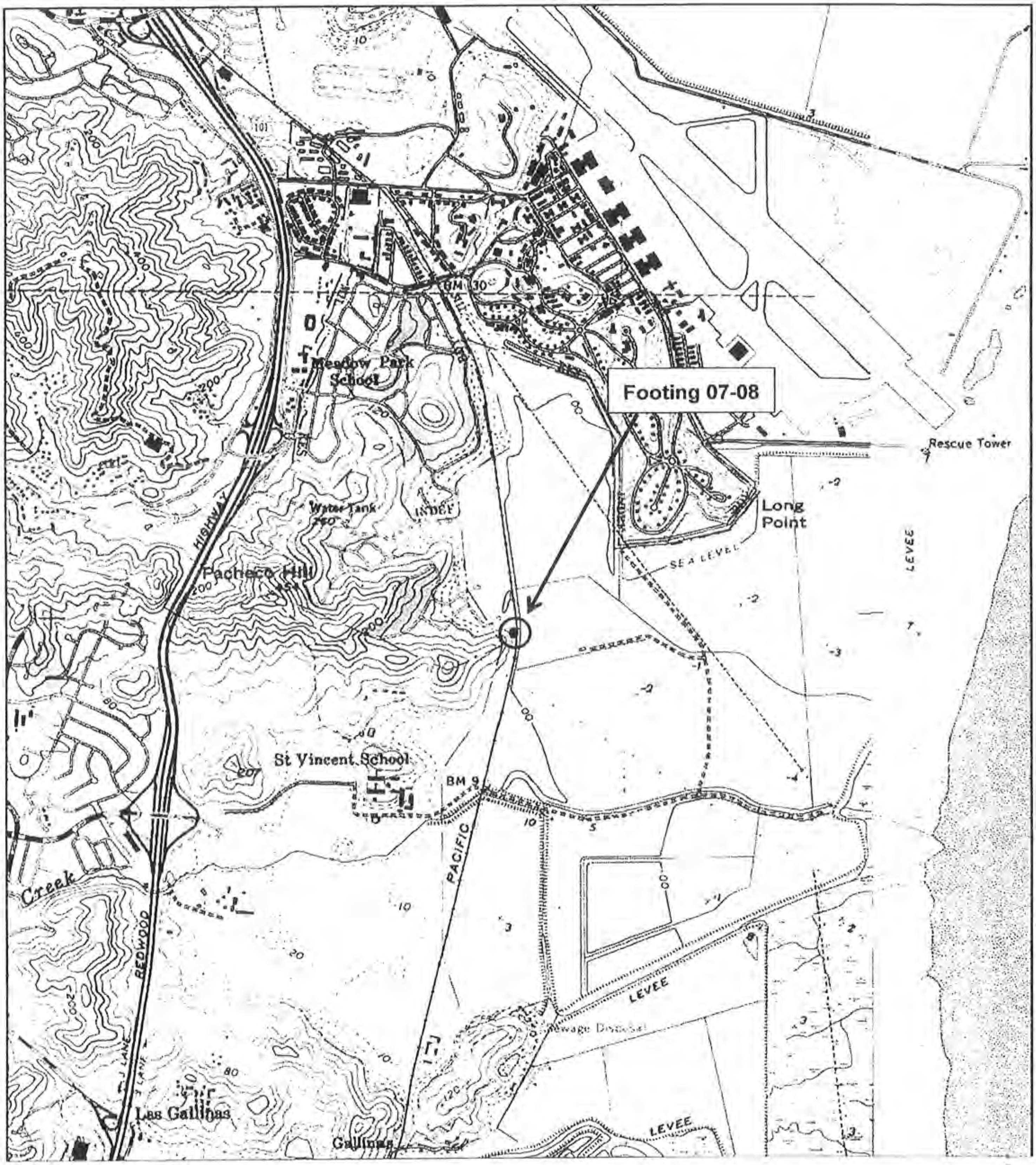
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-21-002618
HRI #
Trinomial

LOCATION MAP

*Resource Name or #: Footing 07-08

*Map Name: Novato *Scale 1:24000 *Date of Map: 1954, PR 1980 N↑



Primary # P-21-002618
HRI #

CONTINUATION SHEET

Trinomial

*Resource Name or # (Assigned by recorder) Footing 08

*Recorded by: Daniel Hart, Garcia and Associates *Date: 2/6/04

☒ Continuation ☐ Update

Footing 08

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code ______ Reviewer ____________ Date

 ***Resource Identifier** (Assigned by recorder): Footing 05 and 06

P1. Other Identifier:

***P2. Location:** ☒Not for Publication ☐Unrestricted ☐a. **County:** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Novato **Date:** 1954 pr 1980 **T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section** (San Pedro Santa Margarita Las Gallinas Rancho)
c. Address City Zip
d. UTM: Zone 10, 541983mE/ 4208967mN

e. Other Locational Data: From Hwy 101 North, take the Miller Road exit and proceed to St. Vincent's school. Follow a dirt access road to the railroad tracks (where they cross Miller Creek). Follow the tracks south approximately ½ mile to the footings. There is one on each side of the tracks.

***P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):** Footing 05 and 06 are square concrete footings. Footing 05 measures approximately 16 x 16 inches. Approximately 5 inches extends above the ground surface. Four bolts extend upright out of the corners of the footing into metal brackets. The bolts are inserted through one of two holes in the metal brackets. A slot in the concrete is present where a wood fixture was set at one time. The footing rests approximately 5 feet west of the railroad tracks. This footing is associated with the railroad, but the function is unknown. Footing 06 approximately 16 x 16 inches. Approximately 6 -8 inches extends above the ground surface. Four bolts extend upright out of the corners of the footing

***P3b. Resources Attributes: (list attributes and codes) : AH2** Foundations/structure pads
***P4. Resources Present:** ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a.

***P5b. Description of Photo:** Footing 05, View to west, 2/6/04

***P6. Date Constructed/Age and Source:** ☐ Prehistoric ☒ Historic ☐ Both

***P7. Owner and Address:**
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

***P8. Recorded by (Name, affiliation, and address):**
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

***P9. Date Recorded: 2/6/04**

***P10. Type of Survey: Describe:** intensive pedestrian

***P11. Report Citation (Cite survey report and other sources, or enter "none."):**
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

***Attachments:** ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-21-002618
HRI #

LOCATION MAP

Trinomial

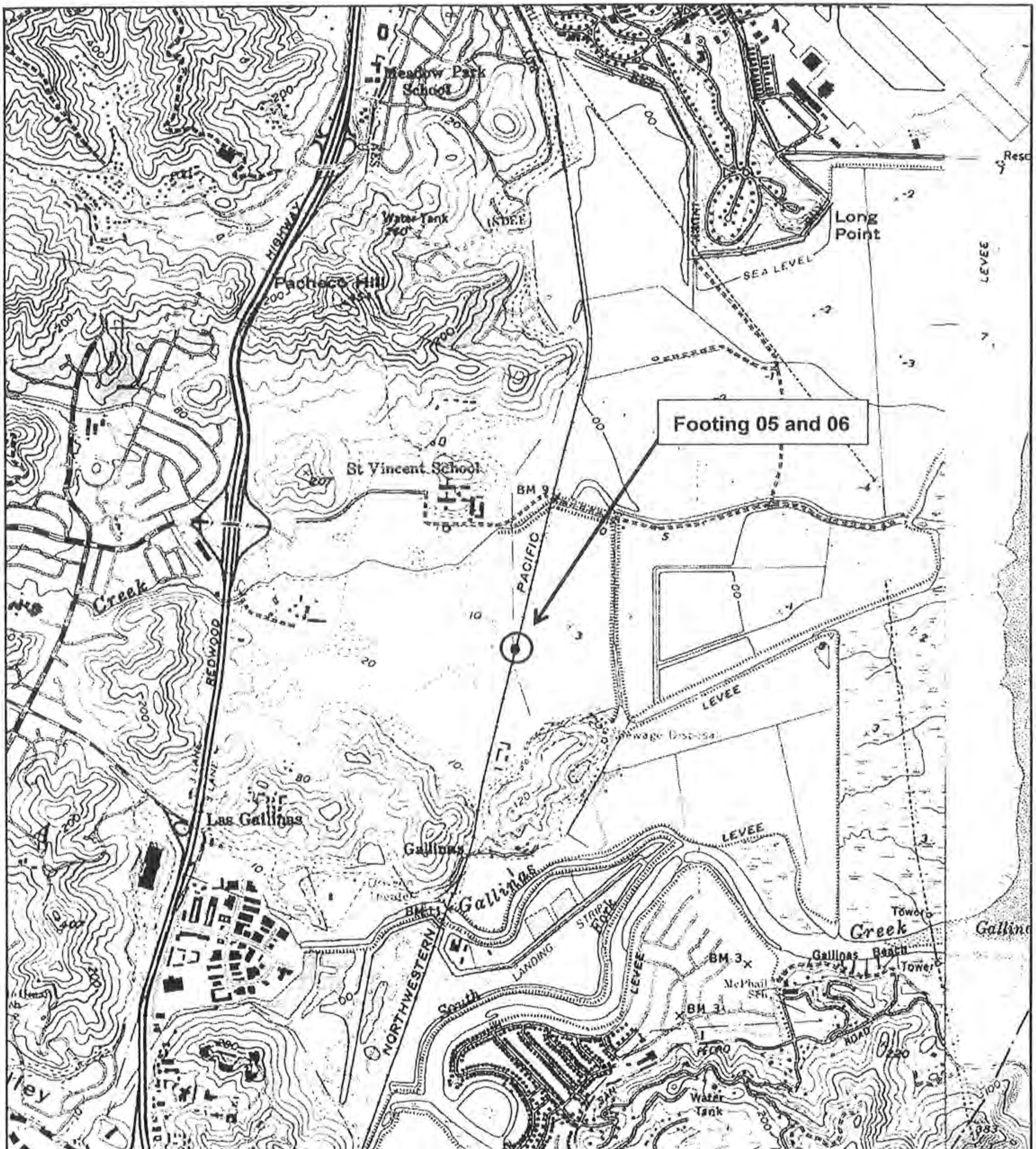
*Resource Name or #: Footing 05 and 06

*Map Name: Novato

*Scale 1:24000

*Date of Map: 1954, PR 1980

N↑



DPR 523J (1/95)

*Required Information

CONTINUATION SHEET

***Resource Name or #** (Assigned by recorder) Footing 06

***Recorded by:** Daniel Hart, Garcia and Associates ***Date:** 2/6/04

☒ Continuation ☐ Update

Footing 06

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code ______ Reviewer ______ Date

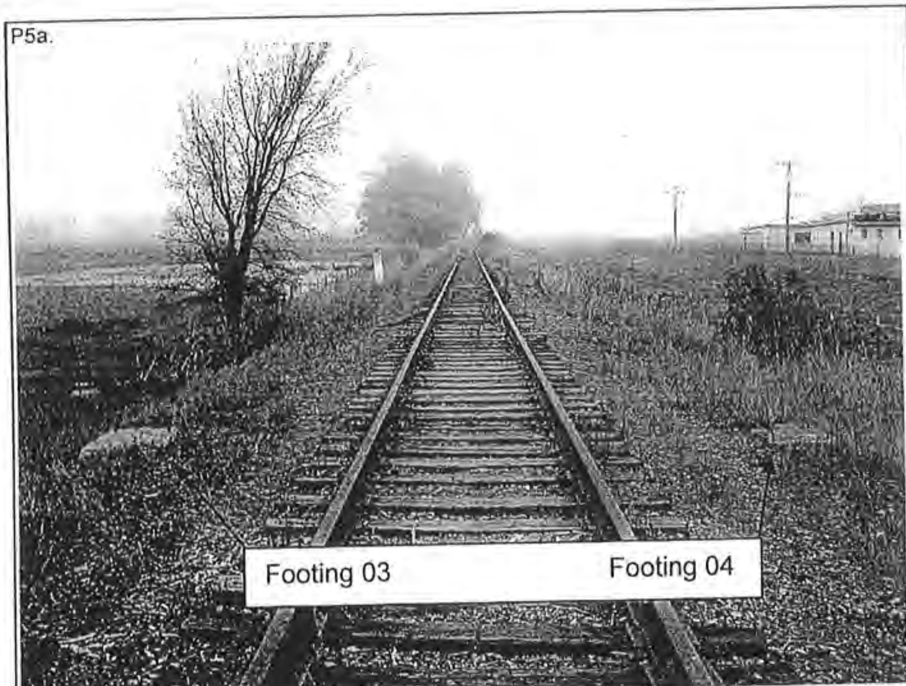
 *Resource Identifier (Assigned by recorder): Footing 03 and 04

P1. Other Identifier:
*P2. Location: ☒Not for Publication ☐Unrestricted ☐a. County: Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Novato Date: 1954 pr 1980 T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section (San Pedro Santa Margarita Las Gallinas Rancho)
c. Address City Zip
d. UTM: Zone 10, 541834mE/ 4208349mN
e. Other Locational Data: North of Gallinas Creek crossing approximately 800 feet.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):
Footing 03 and 04 are concrete footings. Footing 03 measures 16 x 16 inches and is missing a 4 inch portion of the corner. It has three upright bolts extending from the undamaged corners. It rests approximately 6 feet west of the railroad tracks. Footing 04 measures approximately 16 x 16 inches. It is set in the ground flush with the ground surface. Four bent bolts extend upright out of the corners of the footing. It is approximately 5 feet west side of the railroad tracks. These footings are associated with the railroad, but the function is unknown.

*P3b. Resources Attributes: (list attributes and codes) : AH2 Foundations/structure pads
*P4. Resources Present: ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a.



*P5b. Description of Photo: View to the West, Footing 03, Footing 04, 2/6/04

*P6. Date Constructed/Age and Source:
☐ Prehistoric ☒ Historic ☐ Both

*P7. Owner and Address:
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

*P8. Recorded by (Name, affiliation, and address):
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

*P9. Date Recorded: 2/6/04

*P10. Type of Survey: Describe: intensive pedestrian

*P11. Report Citation (Cite survey report and other sources, or enter "none."):
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

h

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-21-002618
HRI #

LOCATION MAP

Trinomial

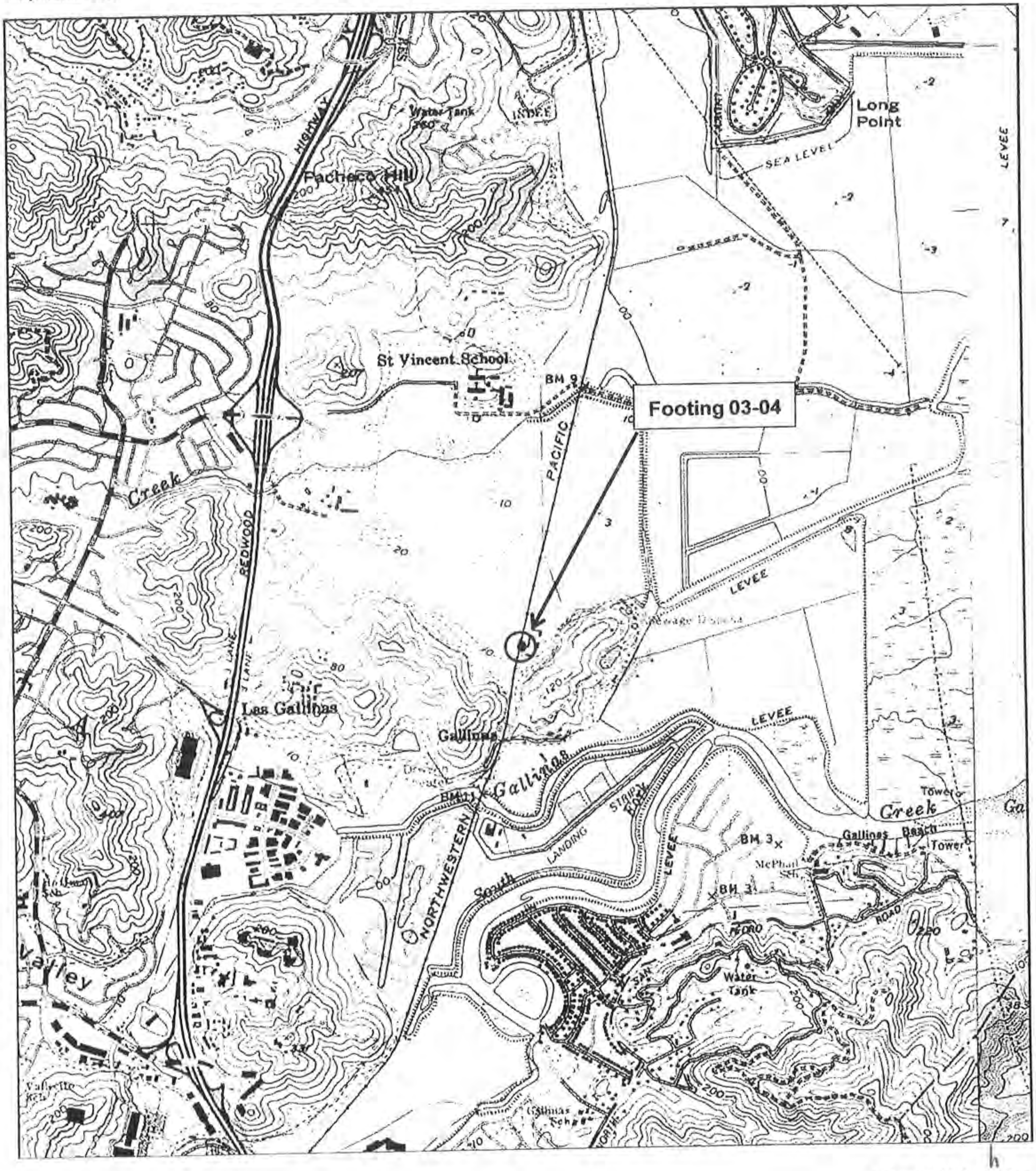
*Resource Name or #: Footing 03-04

*Map Name: Novato

*Scale 1:24000

*Date of Map: 1954, PR 1980

N↑



DPR 523J (1/95)

*Required Information

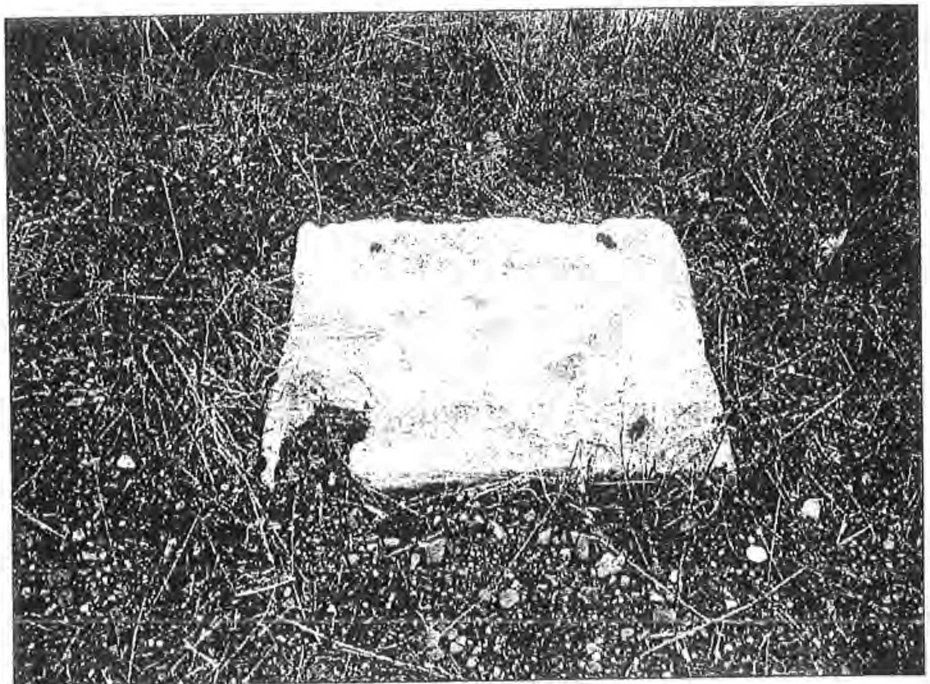
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary # P-21-002618
HRI #
Trinomial

*Resource Name or # (Assigned by recorder)
*Recorded by: Daniel Hart, Garcia and Associates *Date: 2/6/04

☒ Continuation ☐ Update



Footing 04

Footing 03

h
*Required Information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # ~~P-21-002618~~
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code Reviewer Date

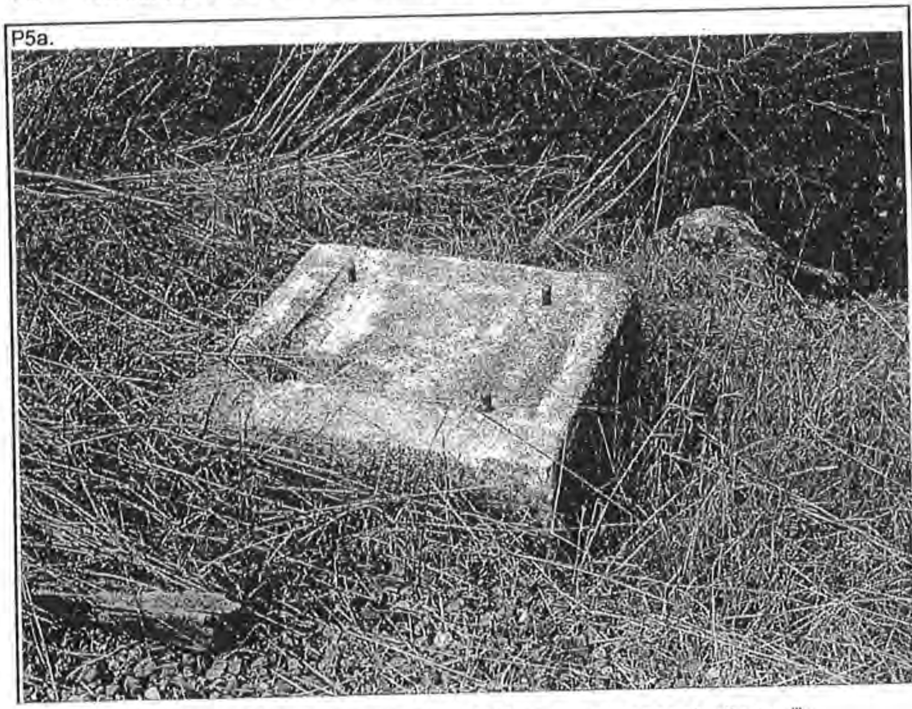
 *Resource Identifier (Assigned by recorder): Footing 02

P1. Other Identifier:
*P2. Location: ☒Not for Publication ☐Unrestricted ☐a. County: Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Novato Date: 1954 pr 1980 T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section (San Pedro Santa Margarita Las Gallinas Rancho)
c. Address City Zip
d. UTM: Zone 10, 541592mE/ 4207494 mN
e. Other Locational Data: South of Gallinas Creek crossing approximately 800 feet.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries): Footing 02 is a concrete footing. It measures approximately 16 x 16 inches. It is set in the ground with approximately 4-5 inches above ground surface. Four bolts extend upright out of the corners of the footing. It rests approximately 6 feet west of the railroad tracks. This footing is associated with the railroad, but the function is unknown.

*P3b. Resources Attributes: (list attributes and codes) : AH2 Foundations/structure pads
*P4. Resources Present: ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a.



*P5b. Description of Photo: View to the West, Footing 02, 2/6/04

*P6. Date Constructed/Age and Source: ☐ Prehistoric ☒ Historic ☐ Both

*P7. Owner and Address:
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

*P8. Recorded by (Name, affiliation, and address):
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

*P9. Date Recorded: 2/6/04

*P10. Type of Survey: Describe: intensive pedestrian

*P11. Report Citation (Cite survey report and other sources, or enter "none."):
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California*. Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

9

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI # P-21-002618

LOCATION MAP

Trinomial

*Resource Name or #: Footing 02

*Map Name: Novato *Scale 1:24000 *Date of Map: 1954, PR 1980

N↑

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code ______ Reviewer ______ Date

 *Resource Identifier (Assigned by recorder): Footing 01

P1. Other Identifier:

***P2. Location:** ☒Not for Publication ☐Unrestricted ☐a. **County:** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Novato **Date:** 1954 pr 1980 **T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section** (San Pedro Santa Margarita Las Gallinas Rancho)
c. **Address** City Zip
d. **UTM: Zone 10, 540734mE/ 4205943mN**

e. **Other Locational Data:** Take the San Pedro Road exit (also for the Marin Civic Center) and turn right on Civic Center. Where Civic Center crosses the railroad tracks, the footing is located immediately southwest.

***P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):** Footing 01 is a deteriorating concrete footing with a wood inset. It measures approximately 13 x 16 inches. It is set flush with the ground surface. Four bolts extended upright out of the corners of the footing and are now bent to the ground. It rests approximately 6 feet south of the railroad tracks. This footing is associated with the railroad, but the function is unknown.

***P3b. Resources Attributes: (list attributes and codes) : AH2** Foundations/structure pads

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)

P5a.

***P5b. Description of Photo: (View, date, accession #)**

***P6. Date Constructed/Age and Source:** ☐ Prehistoric ☒ Historic ☐ Both

***P7. Owner and Address:**
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

***P8. Recorded by (Name, affiliation, and address):**
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

***P9. Date Recorded: 2/6/04**

***P10. Type of Survey: Describe:** intensive pedestrian

***P11. Report Citation (Cite survey report and other sources, or enter "none."):**
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

f

MAY 3 0 200

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-21-002618
HRI #

LOCATION MAP

Trinomial

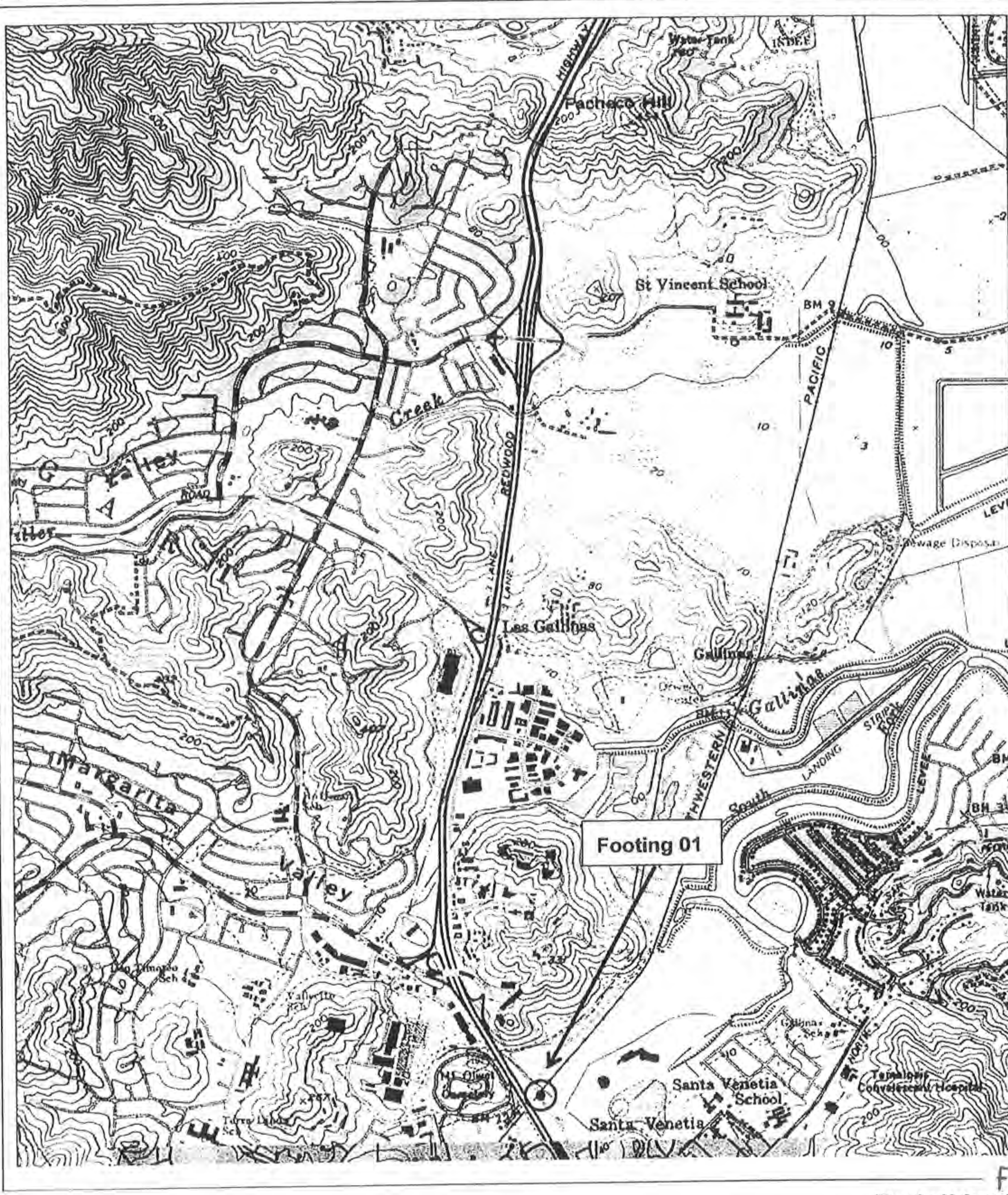
*Resource Name or #: Footing 01

*Map Name: Novato

*Scale 1:24000

*Date of Map: 1954, PR 1980

N↑



*Required Information

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code 6

Other Listings
Review Code Reviewer Date

 ***Resource Name or #** (Assigned by recorder) Map Reference # 3

P1. Other Identifier: Northwestern Pacific Railroad Auburn Street Trestle

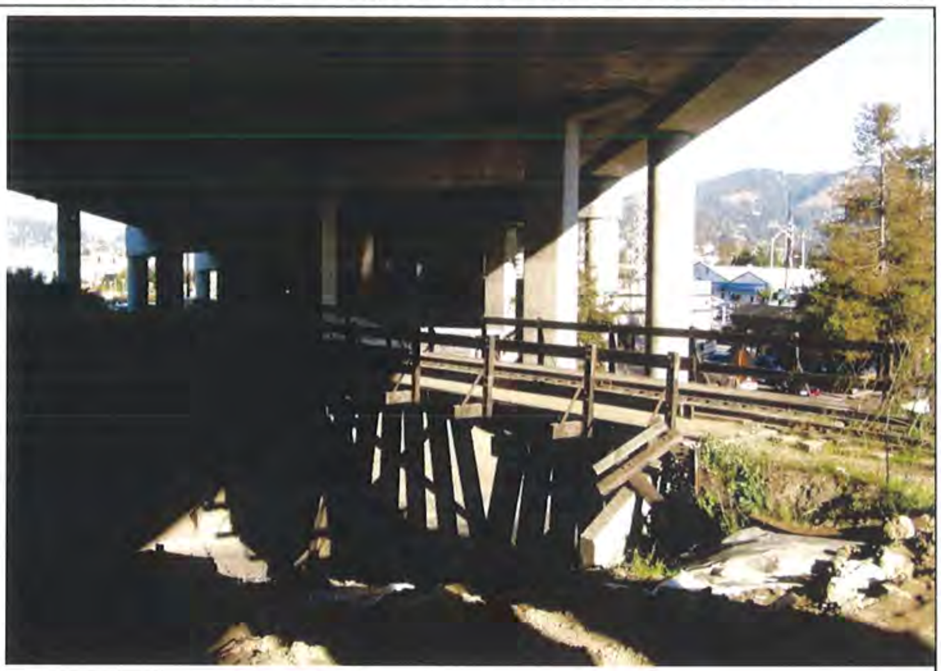
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** San Rafael **Date** 1980 **T** ___; **R** ___; ___ ¼ of Sec ___; ___ **B.M.**
c. Address ___ City ___ Zip ___
d. UTM: (give more than one for large and/or linear resources) Zone ___; ___mE/ ___mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Located under U.S. Highway 101 as it crosses over Auburn Street

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Northwestern Pacific Railroad Auburn Street Trestle is an approximately 60-foot long, wood trestle carrying one set of railroad tracks over Bellam Boulevard in San Rafael and located under Highway 101. (**Photograph 1**) The four span trestle is supported by three timber bents, composed of six, 12 inch by 12 inch wood posts with wood cross-bracing resting on concrete piles, and concrete abutements. (**Photograph 2**) Four wood stringers support the open, timber deck. The trestle is approximately 14 feet wide and includes wood plank, pedestrian walkways and wood railings running the length of the trestle on both side of the track.

***P3b. Resource Attributes:** (List attributes and codes) (HP11) Trestle

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1, camera facing north, January 21, 2004.

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1929, Bridge Inspection Report, Northwestern Pacific, 1955.

***P7. Owner and Address:**
Marin County
3501 Civil Center Drive
San Rafael, California 94903

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert/Cindy Toffelmier
JRP Historical Consulting
1490 Drew Ave, Suite 110
Davis, CA 95616

***P9. Date Recorded:** January 21, 2004

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, "Historical Resources Inventory and Evaluation Report: California Park Hill Railroad Tunnel Project," January 2004.

***Attachments:** NONE ☐ Location Map ☐ Sketch 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)

e

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
BUILDING, STRUCTURE, AND OBJECT RECORD

Primary # P-21-002618
HRI #

***NRHP Status Code** 6

***Resource Name or #** (Assigned by recorder) Map Reference # 3

B1. Historic Name: Northwestern Pacific Railroad Auburn Street Trestle

B2. Common Name: Northwestern Pacific Railroad Auburn Street Trestle

B3. Original Use: Railroad Trestle B4. Present Use: Railroad Trestle

***B5. Architectural Style:** Trestle

***B6. Construction History:** (Construction date, alteration, and date of alterations) Constructed 1929; additional post added to bent 2 in 1953 additional post added to bent 3 and 4 after 1955; ties replaced in 1949.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** ________ **Original Location:** ____________

***B8. Related Features:** __________

B9. Architect: n/a b. Builder: Northwestern Pacific Railroad

***B10. Significance: Theme** n/a **Area** n/a

Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The Northwestern Pacific Railroad Auburn Street Trestle does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be a historical resource for the purposes of CEQA. This trestle does not appear to be significant for its association with historic events or trends in Marin County or in state or national history (Criterion A), nor is it associated with any known historic person (Criterion B). The resource does not embody distinctive engineering characteristics (Criterion C), nor will it likely yield information important to our history (Criterion D). In addition, the trestle lacks integrity to its potential period of historic significance. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

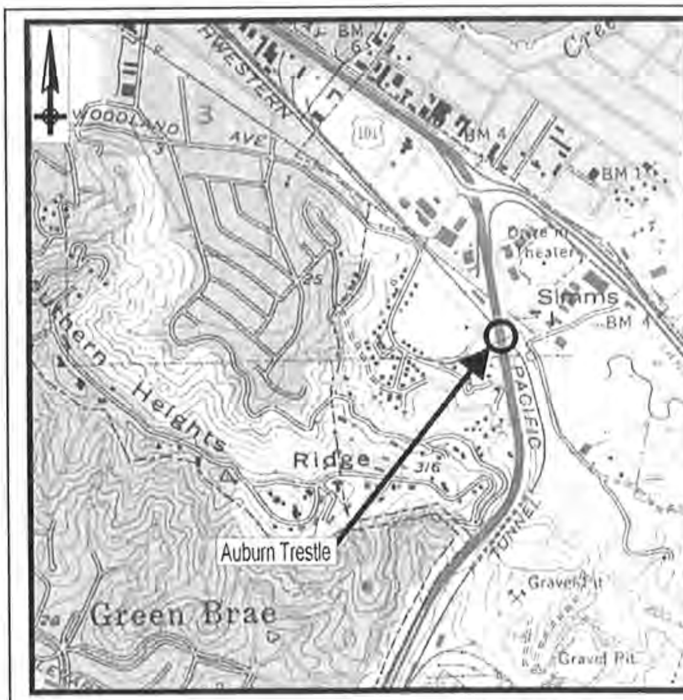
See footnotes, Significance, B10.

B13. Remarks:

***B14. Evaluator:** Rand Herbert/Cindy Toffelmier

***Date of Evaluation:** January 21, 2004

(This space reserved for official comments.)



DPR 523B (1/95)

*Required Information

2

B10. Significance (continued):

The Northwestern Pacific Railroad Auburn Street Trestle (Auburn Street Trestle) is a 1929 trestle built by Northwestern Pacific Railroad (NWP) on the site of a nineteenth century trestle constructed by San Francisco & San Rafael Rail Road Company, one of the numerous railroads merged into NWP in 1907 by parent companies Southern Pacific Railway (SPRR) and the Atcheson, Topeka & Santa Fe Railroad (Santa Fe). The Auburn Street Trestle is one of numerous components of the NWP network modified to accommodate changing transportation trends after consolidation. NWP regularly upgraded structures and railroad lines to keep up with twentieth century technology. Even with routine upgrades, NWP struggled to stay competitive and solvent while serving Marin County residents with reasonably priced transportation into San Francisco. NWP's struggle to remain profitable was a struggle faced by most railroad companies in the early twentieth century. This statement of significance will describe the development and decline of NWP in Marin County, from its nineteenth century freight and passenger rail service to twentieth century interurban passenger service and freight service to north bay and north coast counties. It will also address the significance of the Auburn Street Trestle in the development of the NWP transportation network.

Historical Context of Northwestern Pacific Railroad

The rail system in Marin County dates from the 1860s, when local entrepreneurs sought to develop a transportation network for both freight and passenger travel between the urban center of San Francisco and the increasingly populous Marin and Sonoma Counties. In the late 1850s, north bay communities were looking for more efficient, cost-effective ways to transport local goods to the San Francisco market. By 1860, Sonoma and Marin Counties had a combined population of over 15,000.[1] While farming occupied much of the developed north bay land, farms tended to be near population centers such as San Rafael, Petaluma, and Santa Rosa. San Rafael and Petaluma were served by steamboats. Wagons transported local products to central towns, then to river outlets, which connected north bay communities to San Francisco by steam ferry service. In April 1862 the California legislature granted Charles Minturn, who ran several steam-powered ferryboat enterprises around the San Francisco Bay, the right to build the Petaluma & Haystack Railroad. This first north bay steam-powered railroad ran the two and a half miles between Petaluma and Haystack Landing on Petaluma River, and connected with Minturn's steam powered ferryboats. Steamboats on the run were the *Clinton* and *Contra Costa*, small, single-ended boats that could navigate the river. Local goods still reached Petaluma by wagon road and were loaded onto railroad cars for transport to the river landing. There they were put onto the ferries, which were then sent to San Francisco shipping companies or local markets.[2]

Over the next twenty years, north bay communities sought way to improve local transportation. Citizens' groups funded construction of rail lines reaching further inland, attempting to reduce wagon transportation and use the more efficient rail car. Railroad construction was an expensive and largely financially unsuccessful process. Numerous locally-funded railroad companies organized, merged, and consolidated. In 1868, the Sonoma County

[1] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, "Welcome to California" website sponsored by the State of California, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS. Population statistic: Sonoma County, 11,867, Marin County, 3,334.

[2] John Haskell Kembel, *San Francisco Bay: A Pictorial Maritime History* (New York: Bonanza Books, 1957), 57; Fred A. Stindt and Guy L. Dunscomb, *The Northwestern Pacific Railroad, Redwood Empire Route* (Redwood City, CA: Fred A. Stindt, publisher, 1964), 10.

Railroad Company incorporated for the purposes of building a line from Petaluma to Healdsburg via Santa Rosa. That same year Sonoma County Railroad Company merged with San Francisco & Humboldt Bay Railroad Company, which was organized in 1865 to build a railroad from Petaluma to Cloverdale. The company ran out of money after laying ten miles of track.[3] While the companies were not financially successful, they did manage to build miles of track, adding to the region's expanding steam railroad network.

In 1869, Peter Donahue, developer of the San Francisco & San Jose Railroad (the line now operated as Caltrain) and owner of several small railroad companies in California, organized the San Francisco & North Pacific Rail Road Company and joined with San Francisco & Humboldt Bay Railroad to complete a standard gauge line to Cloverdale.[4] In 1877, Donahue consolidated the San Francisco & North Pacific Rail Road, the Sonoma & Marin Railroad and the Fulton & Guerneville Railroad, all railroads in which Donahue held controlling interest, into the San Francisco & North Pacific Railroad (SF&NPRR). Since the days of the Petaluma & Haystack Railroad, Petaluma had been firmly established as the southern terminus for the expanding rail transportation in the north bay counties because of its connection with the steamboats operating on Petaluma River. The Petaluma River became increasingly difficult for boats to negotiate, so Donahue sought a more direct path to connect his railroad to his ferry services. By 1879, Donahue extended the SF&NPRR south into San Rafael, where the standard gauge track of the SF&NPRR connected with the narrow gauge San Rafael & San Quentin (SR&SQ), a shortline connecting San Rafael to Point San Quentin, where there had been steamboat ferry service into San Francisco since 1869. The transfer between the two lines required passengers and freight to off-load from one line, and be transported by stage or wagon the half-mile to the other line. This cumbersome arrangement proved unsatisfactory, especially to Donahue who wanted his rail line to connect to his steamboat ferry line. In 1882, Donahue organized the San Francisco & San Rafael Rail Road to build a standard gauge line between Point Tiburon and San Rafael, after which the new railroad would merge with the SF&NPRR. Donahue planned a new ferry terminal for Point Tiburon, which would become the new southern terminus for the SF&NPRR. Although the distance between San Rafael and Tiburon required only nine miles of track, the hilly terrain required construction of three tunnels and numerous trestles, including the first trestle constructed on the site of the Auburn Street Trestle. The San Francisco & San Rafael Rail Road Company completed the nine-mile line between San Rafael and Tiburon on April 28, 1884, at a cost of $677,779.50. Tiburon became the permanent southern terminus of SF&NPRR and the point where passengers and cargo were transferred to ferries bound for San Francisco. In 1884, Donahue and the SF&NPRR controlled over 100 miles of railroad line through Marin and Sonoma Counties, and ran eight steam locomotives, ten passenger cars, three baggage, mail and express cars, and 222 freight cars.[5]

Donahue died on November 26, 1885, passing the control of the SF&NPRR to his son, J.M. Donahue, who continued expanding passenger and freight services. The railroad was sold at public auction upon J.M. Donahue's

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[3] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 15.

[4] Peter Donahue came to San Francisco in 1849 and after a short stint in the gold fields, returned to San Francisco and opened a blacksmith shop, which was the beginning of the Union Iron Works, the first foundry in California. Locomotives and cars for Donahue's railroad lines were built in the Donahue foundry. Donahue, with his two brothers, was also the main force behind organizing the San Francisco Gas Company, the first gas utility company in California and the forerunner of Pacific, Gas & Electric Company. For a short biography of Peter Donahue see: Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company, 1852-1952,* (New York: McGraw-Hill Book Company, Inc., 1952). See also: Richard H. Dillon, *Iron Men: Peter, James, and Michael Donahue: California's Industrial Pioneers,* (Richmond, California: Candela Press, 1984).

[5] Stanley Borden, "History of the Northwestern Pacific Railroad," *Western Railroader* 12, 7 (May 1949), 3-5; Kemble, *San Francisco Bay,* 46.

death in 1889 to A.W. Foster, Sydney V. Smith and Andrew Markham, who consolidated the SF&NPRR, Cloverdale & Ukiah Rail Road Company, San Francisco & San Rafael Rail Road, Marin & Napa Rail Road, Sonoma & Santa Rosa Rail Road, and Sonoma Valley Railroad into the San Francisco & North Pacific Railway Company. In 1898, the San Francisco & North Pacific Railway Company entered into a twenty-year lease agreement with the California Northwestern Railway Company, a newly incorporated entity whose backers were interested in connecting the Eureka, Humboldt County and Mendocino coastal timber regions with San Francisco Bay. The growing wood products industry of the north coast counties required a more efficient and cost effective method of moving timber and timber products than transport by ship. By 1902, the California Northwestern Railway Company laid its tracks as far north as Willits in Mendocino County.

The leaders of the Southern Pacific Railroad (SPRR), who up until this time considered north-coast railroad development unimportant, began to take an interest. Already well established in the Central Valley and the East Bay area with its western terminus in Oakland, the SPRR now considered north coast timber as a potentially lucrative addition to their freight business. Connecting the Eureka and Arcata area with San Francisco Bay became the objective. In 1902, SPRR took over a controlling interest in the California Northwestern Railway Company, and in 1903 incorporated the San Francisco & Eureka Railway Company with the goal of building 200 miles of track between Willits and Eureka. At the same time, the Santa Fe Railroad became interested in capturing the north coast timber freight market and organized the San Francisco & Northwestern Railway in May of 1903 to build a competing line between Eureka and San Francisco.[6]

These railroads planned to connect to existing lines around Eureka, which were first constructed around the Humboldt Bay region after 1875. Logging companies built short-line railroads to bring the lumber from the area's vast redwood forests to the mills centered in Eureka and Arcata. Eureka entrepreneur and mill owner John Vance opened the area's first railroad in 1875, which ran along Mad River Slough to Essex, north of Arcata. A private enterprise, the Mad River Railroad was purchased by Vance's nephews, Edgar and John Vance in 1891. In 1892, the Humboldt Bay & Trinidad Lumber & Logging Company purchased the line and incorporated it as the Eureka & Klamath River Railroad (E&KRR) in 1896. The E&KRR soon began work on a line connecting Eureka and Arcata.[7]

California & Northern Railroad (C&N), incorporated in 1901, took over the rail line construction of the Eureka to Arcata segment from the E&KRR, completing it on October 30, 1901. This line left the northern outskirts of Eureka and traveled east along the southeastern margin of Humboldt Bay, turning generally northeast around present day Brainard to Bracut. At Bracut, the line traveled directly north into Arcata, bypassing the small communities of Sunny Brae, Bayside, and Indianola, located on Old Arcata Road. Because the C&N did not have the money to begin operations, the Eel River & Eureka Railroad, a small line connecting the bay with the mills at Scotia, leased the C&N's line and in December of 1901 and began passenger and freight service between Eureka and Arcata. The Santa Fe took over most of these small lines and by 1905, the Santa Fe Railway owned over fifty miles of track in Northern California.[8]

[6] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 15,48; Gilbert H. Kneiss, *Redwood Railways: A History of the Northwestern Pacific Railroad and Predecessor Line* (Berkeley: Howell-North Press, 1956), 130-132.
[7] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 38.
[8] "History of the Northwestern Pacific Railroad," 8-9.

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By 1905 the SPRR and the Santa Fe realized the cost of constructing and operating competing lines into the Humboldt Bay region would be too high to make a profit. Rather than compete, the two companies consolidated. The result was the NWP, incorporated January 8, 1907, which consolidated the San Francisco & North Pacific Railway, California Northwestern Railway, the North Shore Railroad, San Francisco & Northwestern Railway, the Eureka & Klamath Railroad, Fort Bragg & Southeastern Railroad, and later, the San Francisco & Eureka Railway. The SPRR and Santa Fe engineers settled on a route through the main Eel River canyon. Because of the difficult terrain, construction proceeded slowly approximately twenty-five miles per year. The NWP finally completed the line connecting Willits and Eureka in 1914.

Upon incorporation in 1907, the NWP set up in three divisions of steam powered operations. The Northern Division included the standard gauge area near Eureka. The standard gauge from Tiburon to Willits and associated branches became the Western Division. The narrow gauge lines of the former North Pacific Coast/North Shore Railroad were named the Shore Division. Within a few years, the company combined Western Division and Shore Division into the Southern Division.[9]

The Shore Division's narrow gauge lines built by the North Pacific Coast Railroad (NPCR) formed the basis for the early interurban travel in southern Marin County. The NPCR was incorporated in 1871 to build a narrow gauge track running steam trains north from the Sausalito Ferry Terminal to San Anselmo, a line which over the next thirty years extended north to Cazadero through consolidation of numerous companies incorporated to build short segments. NPCR's history was one of financial instability and frequent reorganization under a long line of changing ownership. Originally constructed to reach the timber communities of Marin and Sonoma counties, its tracks wound through Coast Redwood country. The economic decline in the 1890s resulted in a falling off of lumber and agricultural freight shipments. To generate revenues, NPCR joined with Marin County communities in an extensive marketing campaign to promote Marin County as a desirable alternative to San Francisco living. The scheme was not considered a success. Even though ridership increased, population statistics showed negligible increases for Marin County between the 1890 and 1900 census years.[10] Increased ticket sales reflected another marketing strategy promoted by the railroad during the early years of 1900s; NPCR marketed the "Redwood Empire" as a recreation destination for San Franciscans. Even though freight revenues declined, because of increased passenger ridership between 1892 and 1901, the NPCR showed a profit every year except 1896 and 1898.[11] In 1894, NPCR added a double-end ferry, the *Sausalito*, to augment their ferry service. The *Sausalito* was equipped to carry narrow gauge freight cars on the lower deck.

In 1902, a group of investors organized by John Martin and Eugene de Sabla, Jr. recognized the potential of the southern Marin County portion of the NPCR as a good choice for an electrified commuter railroad and purchased the system.[12] Martin changed the name of North Pacific Coast Railroad to North Shore Railroad (NSRR) and began converting its narrow gauge track to standard gauge track, incorporating an additional "third rail" for electrification. The "third rail" method was the most efficient for transmission of the high-voltage electricity

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[9] Fred A. Stindt, "Northwestern Pacific Railroad, Narrow Gauge," *Western Railroad* 31,2 (December 1968): 3.
[10] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.
[11] Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 31.
[12] Development of electrified urban streetcars dated to the 1860s but interurban transportation began in 1893 with a line between Portland, Oregon and Oregon City. In California, John Martin and Eugene de Sabla, Jr. pioneered the construction of high voltage transmission lines over long distances and were among the founders of the Pacific Gas & Electric Company. See: Coleman, *P.G.&E. of California*, 128-137.

required to power the trains, and involved a third rail to run alongside the tracks. The "third rail" was mounted on wooden insulators and carried the electric current. A rod extended from under the rail car and connected to the power supply. Although efficient, the system posed considerable danger from electrocution and required insulated covers inside train stations and anywhere the rails might contact humans. The NSRR became the first, third-rail electric railway in California when the electric interurban began service in August 1903. Commuter trains ran between the passenger ferry terminal in Sausalito to Mill Valley along the path of the old North Pacific Coast Railroad. The first trip from Sausalito to San Rafael via electric train took place on September 19, 1903. In 1904, SPRR purchased the NSRR, which it consolidated into NWP in 1907.

From 1908 to 1914, the NWP completed numerous construction projects to modernize the line's southern end. The most significant was the 1.4 mile section of track constructed between Baltimore Park (now part of Larkspur) and Detour (historic community south of Corte Madera Creek on the NWP line) in 1909. This new section shifted the southern terminal from Point Tiburon to Sausalito for all through steam passenger service. Tiburon continued to be used as the freight loading station. The new line for passenger service now originated in Sausalito, followed a northwest track to Baltimore Park, turned northeast to Detour and connected to the old main line just south of the California Park Tunnel, Tunnel No. 3 on the NWP mainline. By 1912 there was a 65-foot ballast deck trestle on the site of the Auburn Street Trestle.[13]

At this time, the electric interurban route ran northwest from Sausalito to San Anselmo, then east to San Rafael. After the completion of the Baltimore Park-Detour cut off in 1909, electric train service continued to run over the Sausalito-San Anselmo-San Rafael route until 1924. During the early 1920s, track modifications on the Detour-San Rafael segment included the installation of double track, including the drawbridge over Corte Madera Creek at Greenbrae, a double track trestle, double tracking Tunnel No. 3, and likely the existing trestle over Auburn Street, all with the necessary third rail to power electric trains. After completion of double tracking in 1924, electric interurban passenger service was routed over the Baltimore Park-Detour cutoff and through to San Rafael.[14]

The introduction of electric interurban transportation replaced narrow gauge commuter passenger service throughout southern Marin County, although steam narrow gauge service, both freight and passenger, continued running the length of the line for several years. The 1906 earthquake and fire produced a short-lived expansion of the north coast timber industry, which was still serviced by old, narrow gauge lines; but as rebuilding wound down, freight revenues dropped off, and once again the line could not cover expenses. For efficiency, NWP converted more of its track to standard gauge. In 1910, NWP ended the narrow gauge freight car ferry transfer between Sausalito and San Francisco by removing the third rail from their freight car transporting ferries.[15]

Narrow gauge steam passenger service saw some revenue increases in the years after NWP consolidation. NWP continued the North Pacific Coast Railroad's marketing strategy in promoting the Redwood Coast as a resort destination to urban San Franciscans. NWP released an annual publication, "Vacation," which advertised the

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[13] Public Utilities Commission, "Profile and Alignment Mapping of the Northwestern Pacific Railway, Tiburon to Sonoma County Line, Marin County, California," October 3, 1912, Public Utilities Commission Records, California State Archives, Sacramento, California.
[14] Northwestern Pacific Railroad Company, "Authority for Expenditure/Executive Authority Records, Number 1484 and 1484 supplement," Northwestern Pacific Railroad Collection, California State Railroad Museum Library, Sacramento, California; "History of the Northwestern Pacific Railroad," 6-7; Paul Trimble, *Interurban Railways of the Bay Area* (Fresno: Valley Publishers, 1977), 67-76.
[15] "Northwestern Pacific Railroad: Narrow Gauge," 4-5.

many resorts and attractions to be found along the NWP redwood line. NWP marketed the "Triangle Trip," a course originating at the Sausalito ferry terminal, traveling northwest to Monte Rio, east along the Russian River to Fulton, then returning to Sausalito by way of Santa Rosa, Petaluma, and San Rafael, as one of the "finest sight-seeing Trips in the World."[16] Several additional trains were added between 1910 and 1914 during the summer months to meet the passenger increases. However, increased revenues did not balance costs on the aging line. By the mid-1920s the communities served by the narrow gauge steam line regularly complained about the old equipment and unsafe conditions, and in 1927 the California State Public Utilities Commission issued a report that outlined the bleak prospects of the narrow gauge line. The commission recommended the line be abandoned and services replaced by a motor bus with space for 15 passengers, 1500 pounds of freight, express and mail. By 1929 all remaining narrow gauge tracks running stream passenger trains had been abandoned.[17]

During the 1920s, increased use of automobile contributed to the drop in passenger patronage. Heavy annual losses caused Santa Fe to sell out to SPRR; in 1929, the SPRR purchased the Santa Fe's interest in the NWP for $4.6 million, and the NWP became solely a subsidiary of the SPRR.[18] The completion of the Golden Gate Bridge in 1937 provided an automobile connection between San Francisco and Marin County that led to the end of the passenger and freight ferry service and interurban rail transportation to the north bay counties of Marin, Sonoma, and Mendocino. The increasing popularity of automobile ownership, aging rolling stock, and the need for parent company SPRR to eliminate the money-losing commuter lines led the California Railroad Commission to permit abandonment of the interurban-ferryboat services to southern Marin County in 1941. The last electric interurban train in southern Marin County ran February 28, 1941. That same year, the southern terminal of NWP passenger operations shifted from Sausalito to San Rafael. In 1972 NWP ended all train service between Sausalito and San Rafael.[19]

Increased popularity of automobiles coupled with the economic hardships of the Depression contributed to a decline in the use of the NWP line between Willits and Arcata. Both freight and passenger service cut backs dictated branch line and main line closures. Although World War II provided a resurgence of use for the railroad, especially in freight movement, post-war prosperity resumed more cutbacks for NWP as car and truck travel grew. In May of 1942, NWP ended the day passenger service train to Eureka, and by 1958 a small train came through the Eel River Canyon only three times a week. That same year, NWP discontinued the train between San Rafael and Willits. By 1970, the midweek run was cancelled, with only a weekend schedule remaining. In 1984, SPRR sold the trackage from Willits north to Korblex to Eureka Southern Railroad, later named North Coast Railroad. In 1996, the North Coast Railroad and the former south end of the NWP became the Northwestern Pacific Railroad under public ownership.[20]

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[16] Northwestern Pacific Railroad advertising that appeared in the official time schedule dated August 1, 1912. Reprinted in: Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 52.
[17] "Northwestern Pacific Railroad: Narrow Gauge," 15. Trimble, *Interurban Railways of the Bay Area*, 5; "Obituaries, The Northwestern Pacific," *Pacific Traveler*, Railroad Issue, No. 54, October 1971, 8.
[18] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 48, 54; Kneiss, *Redwood Railway,* 134; Northwestern Pacific Railroad, *Re-Driving of the Golden Spike: Northwestern Pacific Rail Service Restored After 1964 Flood Damage* (Northwestern Pacific Railroad Company, 1965), n.p
[19] Paul Trimble, *Interurban Railways of the Bay Area* (Fresno: Valley Publishers, 1977), 67-76.
[20] "Obituaries, The Northwestern Pacific," 8; Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 54-55; Northwestern Pacific Railroad Historical Society, webpage accessed on December 16, 2003. Page created August 29, 2000. Last updated February 13, 2001, http://www.NWPRRHS.ORG.

Table 1: Railroads Consolidated to Form the Northwestern Pacific Railroad and their Subordinate Lines

Railroads	Date Incorporated	Railroad Lines Absorbed and Year of Original Incorporation
San Francisco & North Pacific Railway	December 12, 1888	Contra Costa Steam Navigation Co., 1852 Petaluma & Haystack, 1862 San Francisco & Humboldt Bay Railroad, 1868 Sonoma County Railroad, 1868 San Francisco & North Pacific Rail Road Co., 1869 Sonoma & Marin Railroad, 1874 Sonoma Valley Prismoidal Railway, 1875 San Francisco & North Pacific Railroad, 1877 Fulton & Guerneville Railroad, 1877 Sonoma Valley Railroad, 1878, 1885 Sonoma & Santa Rosa Rail Road, 1881 San Francisco & San Rafael Rail Road, 1882 Marin & Napa Railroad, 1886 Cloverdale & Ukiah Rail Road, 1886 Santa Rosa, Sebastopol & Green Valley Railroad, 1889
California Northwestern Railway	March 17, 1898	
North Shore Railroad	January 11, 1902	San Rafael & San Quentin Rail Road, 1869 North Pacific Coast Railroad, 1871 North Pacific Coast Railroad Extension Co., 1882 North Western Railroad Co. of California, 1885 San Francisco, Tamalpais & Bolinas Railway, 1889
San Francisco & Northwestern Railway	May 12, 1903	Pacific Lumber Co., 1869 The Pacific Lumber Co., 1883 Eel River & Eureka Rail Road, 1882 California & Northern Railway, 1900 California Midland Railroad, 1902
Eureka & Klamath River Railway	January 6, 1896	Vance's Mad River Railroad, 1875 Humboldt Bay & Trinidad Logging & Lumber Co., 1891

The Northwestern Pacific Railroad Auburn Street Trestle

As stated previously, the first trestle constructed on the site of the Auburn Street Trestle likely occurred during the construction of the San Francisco & San Rafael Railroad line between Tiburon and San Rafael in 1884. The line was a single track, approximately nine miles long. By 1912, the site had a 65-foot long ballast deck trestle over

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Auburn Street.[21] The trestle's capacity and condition again came under scrutiny in the 1920s during a general modernization of NWP resources. NWP officials wanted to route interurban electric trains over the Baltimore Park-Detour cut-off which required electrifying the section between Detour and San Rafael, including the Auburn Street Trestle. NWP maintenance records indicate construction of the current trestle occurred in 1929. This structure was built to common standard plan 33, a style of open deck trestle often used to construct trestles under 200 feet. The NWP constructed numerous trestles of various lengths on several different common plans. One example is the trestle over Sir Francis Drake Boulevard in the city of Larkspur, an open deck trestle constructed in 1926 and located just south of the project area. This trestle, also built on a common standard plan, was the subject of a 1988 evaluation by the California Department of Transportation (Caltrans), where the trestle was found to not meet the criteria for listing in the National Register of Historic Places.[22] A survey of trestles under 300 feet built between Tiburon and Petaluma Creek, a distance of approximately 37 miles, indicate 13 trestles built to common standard plan 33. Several modification to the original design occurred over time including adding a post to each of the bents. Originally framed with five posts, bents now contain six posts. Originally constructed with five bents, concrete abutements replaced the two end bents after 1955. Ties date to 1949, likely indicating the year NWP removed the double track from the trestle and replaced it with a single track.[23]

Evaluation of the Northwestern Pacific Railroad Auburn Street Trestle

The following discussion presents an evaluation of the Auburn Street Trestle under National Register and California Register criteria. Examining a single structural element of NWP for significance under Criterion A, as in the case of the Auburn Street Trestle, requires the evaluation consider its context as an element in the entire line as well as an individual structure. As an element in NWP, the Auburn Street Trestle is part of a vast number of elements contributing to the larger NWP system, which included over 570 miles of track, 62 bridges in excess of 300 feet, 57 trestles in excess of 300 feet, and numerous smaller trestles of varying designs, including the Auburn Street Trestle. Collectively, all of these elements served important functions to the total NWP system. This context requires an evaluation of the entire NWP in order to determine significance for individual elements. As an individual structure, the potential period of significance for the Auburn Street Trestle began in 1929 with the construction of the replacement trestle. The trestle's potential period of significance continued until 1941, at which time NWP shifted its southern terminal for steam passenger service to San Rafael, bypassing the Auburn Street Trestle and also ended electric interurban service throughout southern Marin County.

Criterion A (or 1): Railroads, with their associated tunnels, trestles and bridges are potentially significant under Criterion A if they are importantly associated with trends and/or events in transportation development regional or local economic development. Establishing significance, though, should be done with certain principles in mind. Railroads, like other transportation infrastructure, are inherently important to their communities as they substantially affect communication and the distribution of people, goods, and services that in turn affects development on both the local and regional levels. This impact does not typically provide sufficient evidence to demonstrate how a railroad line may be deemed significant for its association with an important historic context; otherwise virtually any railroad, with associated structures would be shown to be important in this way.

[21] "Profile and Alignment Mapping of the Northwestern Pacific Railway, Tiburon to Sonoma County Line, Marin County, California," October 3, 1912."
[22] Gregory King, "Evaluation of the Trestle over Sir Francis Drake Boulevard in the City of Larkspur" (Sacramento: California Department of Transportation, 1988)
[23] *Bridge Inspection Report: Northwestern Pacific* (Southern Pacific Company, 1955), 1-78.

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To be eligible for listing in the National Register, resource types such as railroads and other transportation infrastructure must have demonstrable importance directly related to important historic events and trends, with emphasis given to specific demand for such infrastructure, and its effects on social, economic, commercial, and industrial developments locally, regionally, or nationally. In this way, railroad lines and associated structures, may be significant as physical manifestations of important transportation and community developments on the local, regional, state, or national level.

The most common instance in which a railroad line or its separate structural components might be considered under Criterion A would be if it either the line or separate components (tunnels, trestles, or bridges) were the first to be located at its site, thus providing expanded transportation opportunity and advancing economic development into previously isolated or underdeveloped areas. This development trend, identified as "ahead of demand" development, indicates the transportation route predated development and subsequent development directly related to the presence of the transportation route. One such example of this development pattern would be the line Southern Pacific Railroad constructed down the length of California's San Joaquin Valley. While several towns connected by wagon road existed in the Central Valley, the placement of the new line away from the wagon road initiated the development of a large number of new towns along the new transportation route. These towns, now centers of main populations, exist because the railroad was built through a previously undeveloped area, which in turn opened a new area for economic development.

Railroad lines might also be considered significant under Criterion A if they were likely built to meet specific demands and resulted in immediate and / or substantial effects to a geographic location. While this level of importance typically can be associated with the initial transportation avenue at a particular location, in some cases it can be true of subsequent roads, railroad lines, or highways.

With these points in mind, the Auburn Street Trestle, as a component of the NWP, does not appear to meet the guidelines of Criterion A. Incorporated in 1907, NWP was a consolidation of numerous lines built to meet a specific demand, to facilitate the movement of local products to a wider market, though their construction did not bring immediate or substantial effects to a geographic location. Throughout the nineteenth century, the north bay counties of Marin and Sonoma continually searched for ways to expand market potential for their local products. Because they were separated by water from San Francisco, their main market, connecting to water transportation was imperative. Farming communities established in the 1850s first hauled their goods over wagon roads to rivers that connected to the steam ferryboats, a system that existed on the San Francisco Bay from the early days of the gold rush. The early railroad lines were built to facilitate a process already occurring by other transportation methods. While one could argue that these predecessor lines were built to meet one specific demand, their construction did not bring an immediate or substantial effect to their geographic location. The original lines did not open new areas for development, but were rather an attempt from local citizens to use more modern transportation technology to improve existing access to market. In addition, the lines were not financially successful. Railroad entrepreneurs expected to turn a profit with their investments. Such was not the case in this area, as evidenced by the fact that approximately one-third of the companies that became part of the NWP never laid track. From a financial perspective, the contributing lines of NWP were not a success.

The same can be said for NWP after incorporating in 1907. Formation of NWP occurred through the desire of the SPRR and Santa Fe to profit from the north coast timber industry freight market, and building a rail line connecting north coast lumber mills with the San Francisco shipping lines was long desired by the industry. Because of enormous costs, construction needed the financial backing of companies of the size of SPRR and Santa Fe. Even these two major railroads recognized that their financial interest dictated a merger rather than competition. Upon incorporation, NWP constructed the line through the Eel River canyon and opened through service to Eureka. However, the line between Willits and Eureka was finally completed in 1914, at the end of the age of railroad transport. The automobile was already having an impact on transportation trends and California was in the beginning stages of developing a state highway system.

Although the impetus for incorporating NWP was to move freight, mainly timber products, from the north coast lumber mills to a San Francisco market and distribution center, fluctuation in the timber industry required a broader approach to financial stability for NWP. Passenger service became the primary concern in the early years after incorporation. Upon incorporation, NWP ran a complicated network of narrow gauge local freight and passenger lines, standard gauge local freight and passenger lines, and electrified interurban standard gauge lines through established communities. NWP pursued an aggressive marketing program promoting recreation destinations and Marin County real estate. Population statistics indicate a significant growth in population between 1920 and 1930 (the decade in which the Auburn Street Trestle was construction) throughout Marin County, but increases were slightly below population increases in the San Francisco bay area counties. For example, while Marin County experienced a 60% increase in population between 1920 and 1930, Alameda County grew by more than 89%, San Mateo by over 100%, and Contra Costa County experienced a 75% increase in population.[24] This growth was perhaps enhanced by a generally developing infrastructure, but was not particularly attributable to NWP or its rehabilitation projects.

Marketing the Redwood Coast as a recreation destination and promoting Marin County real estate projects proved moderately successful in boosting revenues, but could not offset the financial loses of the freight service and electric railway. In inheriting the electric interurban system through consolidation, NWP faced a continual struggle to run a cost-effective and efficient line. NWP undertook massive updating projects to improve passenger service over the aging lines with realignment projects, rebuilding tunnels, trestles, and bridges, and replacing aging rolling stock. None of the measures proved effective. Heavy annual losses caused Santa Fe to sell out to SPRR in 1929. Continued losses prompted SRPP in abandon the electric interurban line. Throughout its history, NWP struggled to be profitable. This doe not suggest that the NWP was particularly influential in north bay development, certainly not in the way that other rail lines (such as the Southern Pacific Railroad line through the San Joaquin Valley) were in California.

As NWP does not appear to have opened new areas for social, economic, commercial, or industrial development throughout Marin County, nor once built did NWP appear to have in immediate and / or substantial effects to its surrounding geographic location, the components of the NWP, including the Auburn Street Trestle, do not appear to be eligible for listing in the National Register of Historic Places under Criterion A at either the local, state, or national level.

The Auburn Street Trestle as single structural element of NWP also does not appear to meet the guidelines of Criterion A eligibility. The trestle might be determined eligible if its construction caused new areas to open for development, or its construction brought immediate and / or substantial effects to a geographic location. Such is

[24] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.

not the case with this trestle. Constructed in 1929, the trestle replaced another built on the site. The earlier trestle was part of nineteenth century efforts to create a more direct connection for freight and passenger travel to San Francisco. This earlier trestle also did not appear to open the surrounding area for development, as San Rafael, incorporated in 1874, had been an established population center since the Mexican era and connected to San Francisco ferry service since 1869. Furthermore, the trestle over Sir Francis Drake Boulevard in the city of Larkspur, an open deck trestle built on standard plans, constructed in 1926, and located just south of the project area, was determined to not meet the criteria for listing in the National Register of Historic Places in an 1988 evaluation by the California Department of Transportation (Caltrans).[25] By itself, the Auburn Street Trestle would not be considered sufficiently significant to appear to be eligible for listing in the National Register of Historic Places under Criterion A at either the local, state, or national level.

Criterion B (or 2): Research did not suggest that the Auburn Street Trestle have associations with persons who gained prominence in their professions or made significant contributions in local, state, or national history. While certain NWP predecessor lines appeared to have associations with persons who made significant contributions state history, such as Peter Donahue, and prominent and influential San Francisco industrialist, and John Martin and Eugene de Sabla, Jr., (pioneers in high voltage electric transmission) the trestle or the NWP are not structures that best exemplify their significance in our history. These individuals are not importantly associated with the resource in their prominent capacity. Therefore NWP does not appear eligible under this criterion.

Criterion C (or 3): The Auburn Street Trestle is a structure built on common standard design 33, representing no particular engineering achievement at the time it was constructed. As indicated, The Auburn Street Trestle was one of 13 open deck trestles built on this design in Marin County between 1915 and 1950. Nothing in the construction of Auburn Street Trestle suggests that it was designed and built through anything other than standard processes. Thus it would not appear to meet the criteria for listing in the National Register of Historic Places under Criterion C.

Criterion D or 4: This criterion is usually reserved for archeological sites if they have yielded, or may likely yield, information important in pre-history or history. The property must have, or have had, information to contribute to our understanding of history, and the information must be considered important. However, this property is well documented in the historical record and thus would not appear to meet the criteria for listing in the National Register of Historic Places under Criterion D.

Integrity

Integrity of an historic resource is measured by application of seven factors: location, design, setting, workmanship, materials, feeling, and association. Integrity should be assessed on the basis of the period of significance for a property. A property's integrity should be specifically tied to its period of significance, a linkage that is derived from National Register guidelines and regulations. The property must retain integrity to its potential period of significance if it is to meet the criteria for listing in the National Register of Historic Places or as an important resource under California law and regulations.

[25] Gregory King, "Evaluation of the Trestle over Sir Francis Drake Boulevard in the City of Larkspur" (Sacramento: California Department of Transportation, 1988)

The Auburn Street Trestle has not retained a high level of integrity in the seven measures when evaluated in the context of its period of significance. Alterations to the original design in the form of added posts to bents compromise original design. The original design suffered further when two of the original bents were replaced with concrete abutements. The double track system with additional third electric rail for which the 1929 trestle was constructed, was removed and replaced with a single track. Integrity of setting, feelings and association were severely compromised with the construction of U.S. 101 over the Auburn Street Trestle.

*Resource Name or # (Assigned by recorder) Map Reference # 3

*Recorded by Rand Herbert/Cindy Toffelmier *Date January 21, 2004 ☒ Continuation ☐ Update

Photographs

Photograph 2, camera facing north, January 21, 2004.

Photograph 3, deck, camera facing north, January 21, 2004.

e

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code 6

Other Listings
Review Code Reviewer Date

 *Resource Name or # (Assigned by recorder) Map Reference # 2

P1. Other Identifier: Northwestern Pacific Railroad

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Rafael **Date** 1980 **T** ___; **R** ___; __ ¼ **of Sec** ___; ______ **B.M.**

c. Address ______ City ___________ Zip ____

d. UTM: (give more than one for large and/or linear resources) Zone ______; ______________ mE/ ______________ mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Elevation, 70 feet. Segment located between the California Park Hill Tunnel and the Northwestern Pacific Railroad Auburn Street Trestle.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The approximately 1750 foot segment of the Northwestern Pacific Railroad between the California Park Hill Tunnel North Portal and the Northwestern Pacific Railroad Auburn Street Trestle consists of a single set of at-grade tracks, some of which are stamped with Colorado Sec 754 1913 011. Rails rest on a mix of pressure treated and non-pressure treated ties. The railroad segment is no longer in service and vegetation and earth covers the tracks and ballast. An access road runs along a short portion of the segment and crosses the track approximately 1200 feet north of the California Park Hill Tunnel North Portal.

***P3b. Resource Attributes:** (List attributes and codes) (HP39) Railroad grade

***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Photograph 1, camera facing northwest, January 21, 2004.

***P6. Date Constructed/Age and Sources:** ☒ Historic ☐ Prehistoric ☐ Both

1912-13, Public Utilities Commission records; site fieldwork

***P7. Owner and Address:**

Marin County
3501 Civil Center Drive
San Rafael, California 94903

***P8. Recorded by:** (Name, affiliation, address)

Rand Herbert/Cindy Toffelmier
JRP Historical Consulting
1490 Drew Ave, Suite 110
Davis, CA 95616

***P9. Date Recorded:** January 21, 2004

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, "Historical Resources Inventory and Evaluation Report: California Park Hill Railroad Tunnel Project," January 2004.

***Attachments:** NONE ☐ Location Map ☐ Sketch 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) ______

d

***NRHP Status Code** 6

***Resource Name or #** (Assigned by recorder) Map Reference #2

B1. Historic Name: Northwestern Pacific Railroad
B2. Common Name: Northwestern Pacific Railroad
B3. Original Use: Railroad B4. Present Use: Railroad
***B5. Architectural Style:** None
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1884; Second track added 1912-13

***B7. Moved?** ☒ No ☐ Yes ☐ Unknown **Date:** ________ **Original Location:** ________
***B8. Related Features:** See Description, P3a.

B9. Architect: n/a b. Builder: Northwestern Pacific Railroad
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The portion of the Northwestern Pacific Railroad located within the study area does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be a historical resource for the purposes of CEQA. This form does not record or evaluate the entire Northwestern Pacific Railroad, instead, for the purposes of the proposed project, it records and evaluates only the approximately 1750 foot portion of the line in Marin County north of the California Park Hill Tunnel and south of the Northwestern Pacific Railroad Auburn Street Trestle. This line was examined in order to assess its potential eligibility both as part of a larger system and as an individual section. This railroad section does not appear to be significant for its association with historic events or trends in Marin County or in state or national history (Criterion A), nor is it associated with person significant in our history (Criterion B). The resource does not embody distinctive engineering characteristics (Criterion C), nor will it likely yield information important to our history (Criterion D). In addition, the segment lacks integrity to its potential period of historic significance. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

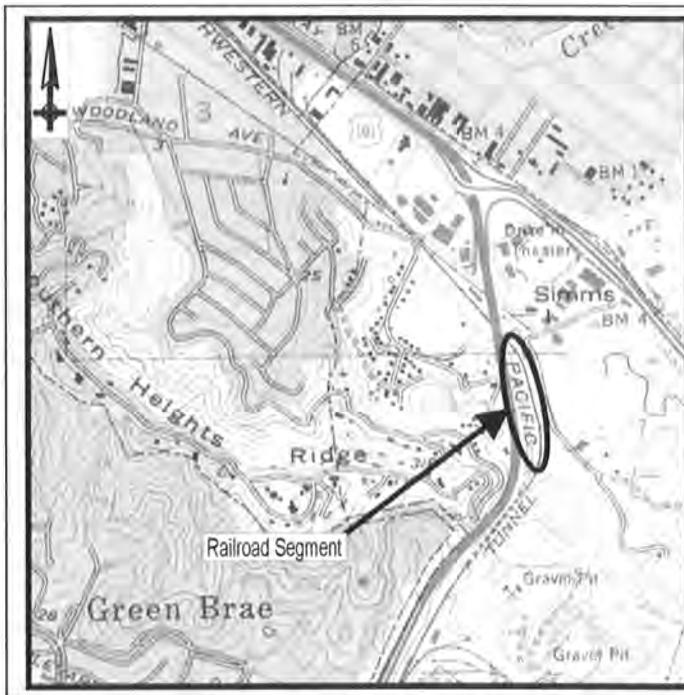
***B12. References:**
See footnotes, Significance, B10.

B13. Remarks:

***B14. Evaluator:** Rand Herbert/Cindy Toffelmier

***Date of Evaluation:** January 21, 2004

(This space reserved for official comments.)



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # P-21-002618
HRI #
Trinomial

*Resource Name or # (Assigned by recorder) Map Reference # 2A

L1. Historic and/or Common Name: Northwestern Pacific Railroad

L2a. Portion Described: ☐ Entire Resource Segment ☒ Point Observation **Designation:** Point 2A

***b. Location of point or segment:** (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.)

This survey point is located near the California Park Hill Tunnel North Portal.

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)

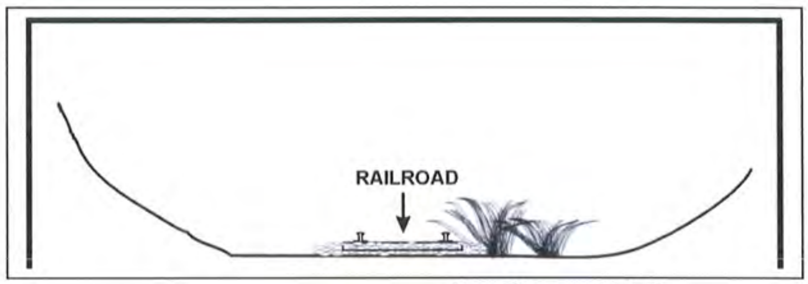
At this, the southern most point recorded, the abandoned railroad is a single track, at grade level with timber ties. (**Photograph 2**) Grade width varies between approximately 45 feet and 75 feet.

L4. Dimensions: (in feet for historic features and meters for prehistoric features)

At-grade single railroad track.

L5. Associated Resources:

California Park Hill Tunnel; Auburn Trestle



See Photograph 2.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.)

Railroad sits in V-cut with a concrete slab walkway covering the east edge leading to the North Portal. Vegetation covers tracks, ties and ballast.

L7. Integrity Considerations:

L8b. Description of Photo, Map, or Drawing: Photograph 2, camera facing south to North Portal of the California Park Tunnel, January 21, 2004.

L9. Remarks:

L10. Form prepared by: (Name, affiliation, address) Rand Herbert/C.Toffelmier
JRPHistorical Consulting
1490 Drew Ave, Suite 110,
Davis, CA 95616

L11. Date: January 21, 2004

d

***Resource Name or #** (Assigned by recorder) Map Reference # 2B

L1. Historic and/or Common Name: Northwestern Pacific Railroad

L2a. Portion Described: ☐ Entire Resource Segment ☒ Point Observation **Designation:** Point 2B

***b. Location of point or segment:** (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.)

This survey point is located near the access road crossing, approximately 1200 feet north of the California Park Tunnel North Portal.

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)

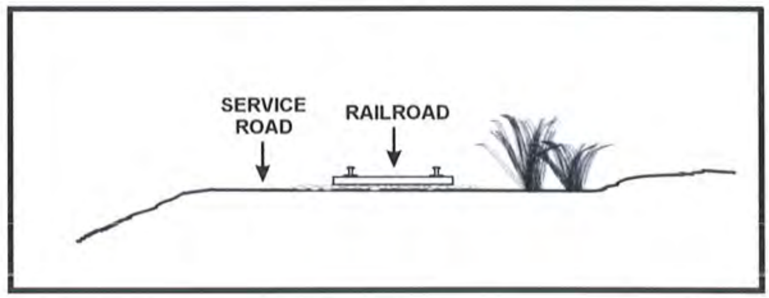
At this recordation point, the abandoned railroad is a single track, at grade level with timber ties. **(Photograph 3)** Grade width varies between approximately 45 feet and 75 feet.

L4. Dimensions: (in feet for historic features and meters for prehistoric features)

At-grade single railroad track.

L5. Associated Resources:

California Park Hill Tunnel; Auburn Trestle



See Photograph 3.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.)

Railroad sits on a plateau with access road east of track. Vegetation covers tracks, ties and ballast.

L7. Integrity Considerations:

L8b. Description of Photo, Map, or Drawing: Photograph 3, camera facing south, January 21, 2004.

L9. Remarks:

L10. Form prepared by: (Name, affiliation, address) Rand Herbert/C.Toffelmier
JRP Historical Consulting
1490 Drew Ave, Suite 110,
Davis, CA 95616

L11. Date: January 21, 2004

B10. Significance (continued):

The Northwestern Pacific Railroad (NWP) segment in the study area is 1912/1913 alignment that follows the alignment of track constructed in 1884 by San Francisco & San Rafael Rail Road Company, one of the numerous railroads merged into NWP in 1907 by parent companies Southern Pacific Railway (SPRR) and the Atcheson, Topeka & Santa Fe Railroad (Santa Fe). This segment of track is one of the numerous sections NWP modified while attempting to keep up with twentieth century transportation technology. Even with routine upgrades, NWP struggled to stay competitive and solvent while serving Marin County residents with reasonably priced transportation into San Francisco. As transportation systems changed, NWP's struggle to remain profitable was a struggle faced by most railroad companies in the early twentieth century. This statement of significance will describe the development and decline of NWP in Marin County, from its nineteenth century freight and passenger rail service to twentieth century interurban passenger service and freight service to north bay and north coast counties. It will also address the significance of this segment of track in the development of the NWP transportation network.

Historical Context of Northwestern Pacific Railroad

The rail system in Marin County dates from the 1860s, when local entrepreneurs sought to develop a transportation network for both freight and passenger travel between the urban center of San Francisco and the increasingly populous Marin and Sonoma Counties. By 1860, Sonoma and Marin Counties had a combined population of over 15,000.[1] In the late 1850s, north bay communities began looking for more efficient, cost-effective ways to transport local goods to the San Francisco market. While farming occupied much of the developed north bay land, farms tended to be near population centers such as San Rafael, Petaluma, and Santa Rosa. Wagons transported local products to the central towns, then to river outlets, which connected north bay communities to San Francisco by steamboat ferry service. In April 1862 the California legislature granted Charles Minturn, who ran several steam-powered ferryboat enterprises around the San Francisco Bay, the right to build the Petaluma & Haystack Railroad. This first north bay steam-powered railroad ran the two and a half miles between Petaluma and Haystack Landing on Petaluma River, and connected with Minturn's steam powered ferryboats. Steamboats on the run were the *Clinton* and *Contra Costa*, small, single-ended boats that could navigate the river. Local goods still reached Petaluma by wagon road and were loaded onto railroad cars for transport to the river landing. There they were put onto the ferries, which were then sent to San Francisco shipping companies or local markets.[2]

Over the next twenty years, north bay communities sought way to improve local transportation. Citizens' groups funded construction of rail lines reaching further inland, attempting to reduce wagon transportation and use the more efficient rail car. Railroad construction was an expensive and largely financially unsuccessful process. Numerous locally-funded railroad companies organized, merged, and consolidated. In 1868, the Sonoma County

[1] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, "Welcome to California" website sponsored by the State of California, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS. Population statistic: Sonoma County, 11,867, Marin County, 3,334.

[2] John Haskell Kembel, *San Francisco Bay: A Pictorial Maritime History* (New York: Bonanza Books, 1957), 57; Fred A. Stindt and Guy L. Dunscomb, *The Northwestern Pacific Railroad, Redwood Empire Route* (Redwood City, CA: Fred A. Stindt, publisher, 1964), 10.

Railroad Company incorporated for the purposes of building a line from Petaluma to Healdsburg via Santa Rosa. That same year Sonoma County Railroad Company merged with San Francisco & Humboldt Bay Railroad Company, which was organized in 1865 to build a railroad from Petaluma to Cloverdale. The company ran out of money after laying ten miles of track.[3] While the companies were not financially successful, they did manage to build many miles of track, adding to the region's expanding steam railroad network.

In 1869, Peter Donahue, developer of the San Francisco & San Jose Railroad (the line now operated as Caltrain) and owner of several small railroad companies in California, organized the San Francisco & North Pacific Rail Road Company and joined with San Francisco & Humboldt Bay Railroad to complete a standard gauge line to Cloverdale.[4] In 1877, Donahue consolidated the San Francisco & North Pacific Rail Road, the Sonoma & Marin Railroad and the Fulton & Guerneville Railroad, all railroads in which Donahue held controlling interest, into the San Francisco & North Pacific Railroad (SF&NPRR). Since the days of the Petaluma & Haystack Railroad, Petaluma had been firmly established as the southern terminus for the expanding rail transportation in the north bay counties because of its connection with the steamboats operating on Petaluma River. As the Petaluma River became increasingly difficult for boats to negotiate Donahue sought a more direct path to connect his railroad to his ferry services. By 1879, Donahue extended the SF&NPRR south into San Rafael, where the standard gauge track of the SF&NPRR connected with the narrow gauge San Rafael & San Quentin (SR&SQ), a shortline connecting San Rafael to Point San Quentin, where there had been steamboat ferry service into San Francisco since 1869. The transfer between the two lines required passengers and freight to off-load from one line, and be transported by stage or wagon the half-mile to the other line. This cumbersome arrangement proved unsatisfactory, especially to Donahue who wanted his rail line to connect to his steamboat ferry line. In 1882, Donahue organized the San Francisco & San Rafael Rail Road to build a standard gauge line between Point Tiburon and San Rafael, after which the new railroad would merge with the SF&NPRR. Donahue planned a new ferry terminal for Point Tiburon, which would become the new southern terminus for the SF&NPRR. Although the distance between San Rafael and Tiburon required only nine miles of track, the hilly terrain required construction of several trestles and three tunnels, including the first tunnel constructed on the site of the present California Park Tunnel. The San Francisco & San Rafael Rail Road Company completed the nine-mile line between San Rafael and Tiburon on April 28, 1884, at a cost of $677,779.50. Tiburon became the permanent southern terminus of SF&NPRR and the point where passengers and cargo were transferred to ferries bound for San Francisco. In 1884, Donahue and the SF&NPRR controlled over 100 miles of railroad line through Marin and Sonoma Counties, and ran eight steam locomotives, ten passenger cars, three baggage, mail and express cars, and 222 freight cars.[5]

Donahue died on November 26, 1885, passing the control of the SF&NPRR to his son, J.M. Donahue, who continued expanding passenger and freight services. The railroad was sold at public auction upon J.M. Donahue's

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[3] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 15.

[4] Peter Donahue came to San Francisco in 1849 and after a short stint in the gold fields, returned to San Francisco and opened a blacksmith shop, which was the beginning of the Union Iron Works, the first foundry in California. Locomotives and cars for Donahue's railroad lines were built in the Donahue foundry. Donahue, with his two brothers, was also the main force behind organizing the San Francisco Gas Company, the first gas utility company in California and the forerunner of Pacific, Gas & Electric Company. For a short biography of Peter Donahue see: Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company, 1852-1952,* (New York: McGraw-Hill Book Company, Inc., 1952). See also: Richard H. Dillon, *Iron Men: Peter, James, and Michael Donahue: California's Industrial Pioneers,* (Richmond, California: Candela Press, 1984).

[5] Stanley Borden, "History of the Northwestern Pacific Railroad," *Western Railroader* 12, 7 (May 1949), 3-5; Kemble, *San Francisco Bay,* 46.

death in 1889 to A.W. Foster, Sydney V. Smith and Andrew Markham, who consolidated the SF&NPRR, Cloverdale & Ukiah Rail Road Company, San Francisco & San Rafael Rail Road, Marin & Napa Rail Road, Sonoma & Santa Rosa Rail Road, and Sonoma Valley Railroad into the San Francisco & North Pacific Railway Company. In 1898, the San Francisco & North Pacific Railway Company entered into a twenty-year lease agreement with the California Northwestern Railway Company, a newly incorporated entity whose backers were interested in connecting the Eureka, Humboldt County and Mendocino coastal timber regions with San Francisco Bay. The growing wood products industry of the north coast counties required a more efficient and cost effective method of moving timber and timber products than transport by ship. By 1902, the California Northwestern Railway Company laid its tracks as far north as Willits in Mendocino County.

The leaders of the Southern Pacific Railroad (SPRR), who up until this time considered north-coast railroad development unimportant, began to take an interest. Already well established in the Central Valley and the East Bay area with its western terminus in Oakland, the SPRR now considered north coast timber as a potentially lucrative addition to their freight business. Connecting the Eureka and Arcata area with San Francisco Bay became the objective. In 1902, SPRR took over a controlling interest in the California Northwestern Railway Company, and in 1903 incorporated the San Francisco & Eureka Railway Company with the goal of building 200 miles of track between Willits and Eureka. At the same time, the Santa Fe Railroad became interested in capturing the north coast timber freight market and organized the San Francisco & Northwestern Railway in May of 1903 to build a competing line between Eureka and San Francisco.[6]

Railroads were first constructed around the Humboldt Bay region after 1875. Logging companies built short-line railroads to bring the lumber from the area's vast redwood forests to the mills centered in Eureka and Arcata. Local entrepreneur and mill owner John Vance of Eureka opened the area's first railroad in 1875 along the Mad River Slough to Essex, north of Arcata. A private enterprise, the Mad River Railroad was purchased by Vance's nephews, Edgar and John Vance in 1891. In 1892, the Humboldt Bay & Trinidad Lumber & Logging Company purchased the line and incorporated it as the Eureka & Klamath River Railroad (E&KRR) in 1896. The E&KRR soon began work on a line connecting Eureka and Arcata.[7]

California & Northern Railroad (C&N), incorporated in 1901, took over the rail line construction of the Eureka to Arcata segment from the E&KRR, completing it on October 30, 1901. This line left the northern outskirts of Eureka and traveled east along the southeastern margin of Humboldt Bay, turning generally northeast around present day Brainard to Bracut. At Bracut, the line traveled directly north into Arcata, bypassing the small communities of Sunny Brae, Bayside, and Indianola, located on Old Arcata Road. Because the C&N did not have the money to begin operations, the Eel River & Eureka Railroad, a small line connecting the bay with the mills at Scotia, leased the C&N's line and in December of 1901 and began passenger and freight service between Eureka and Arcata. The Santa Fe took over most of these small lines and by 1905, the Santa Fe Railway owned over fifty miles of track in Northern California.[8]

By 1905 the SPRR and the Santa Fe realized the cost of constructing and operating competing lines into the Humboldt Bay region would be too high to make a profit. Rather than compete, the two companies consolidated.

[6] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 15,48; Gilbert H. Kneiss, *Redwood Railways: A History of the Northwestern Pacific Railroad and Predecessor Line* (Berkeley: Howell-North Press, 1956), 130-132.
[7] Stindt and Dunscomb, *The Northwestern Pacific Railroad,*38.
[8] "History of the Northwestern Pacific Railroad," 8-9.

The result was the NWP, incorporated January 8, 1907, which consolidated the San Francisco & North Pacific Railway, California Northwestern Railway, the North Shore Railroad, San Francisco & Northwestern Railway, the Eureka & Klamath Railroad, Fort Bragg & Southeastern Railroad, and later, the San Francisco & Eureka Railway. The SPRR and Santa Fe engineers settled on a route through the main Eel River canyon. Because of the difficult terrain, construction proceeded slowly approximately twenty-five miles per year, and included construction of twenty-eight new tunnels. The NWP finally completed the line connecting Willits and Eureka in 1914.

Upon incorporation in 1907, the NWP set up in three divisions of steam-powered operations. The Northern Division included the standard gauge area near Eureka. The standard gauge from Tiburon to Willits and associated branches became the Western Division. The narrow gauge lines of the former North Pacific Coast/North Shore Railroad were named the Shore Division. Within a few years, the company combined Western Division and Shore Division into the Southern Division.[9]

The Shore Division's narrow gauge lines built by the North Pacific Coast Railroad (NPCR) formed the basis for the early interurban travel in southern Marin County. The NPCR incorporated in 1871 to build a narrow gauge track running steam trains north from the Sausalito Ferry Terminal to San Anselmo, a line which over the next thirty years extended north to Cazadero through consolidation of numerous companies incorporated to build short segments. NPCR's history was one of financial instability and frequent reorganization under a long line of changing ownership. Originally constructed to reach the timber communities of Marin and Sonoma counties, its tracks wound through Coast Redwood country. The economic decline in the 1890s resulted in a falling off of lumber and agricultural freight shipments. To generate revenues, NPCR joined with Marin County communities in an extensive marketing campaign to promote Marin County as a desirable alternative to San Francisco living. The scheme was not considered a success. Even though ridership increased, population statistics showed negligible increases for Marin County between the 1890 and 1900 census years.[10] Increased ticket sales reflected another marketing strategy promoted by the railroad during the early years of 1900s; NPCR marketed the "Redwood Empire" as a recreation destination for San Franciscans. Even though freight revenues declined, because of increased passenger ridership between 1892 and 1901, the NPCR showed a profit every year except 1896 and 1898.[11] In 1894, NPCR added a double-end ferry, the *Sausalito*, to augment their ferry service. The *Sausalito* was equipped to carry narrow gauge freight cars on the lower deck.

In 1902, a group of investors organized by John Martin and Eugene de Sabla, Jr. recognized the potential of the southern Marin County portion of the NPCR as a good choice for an electrified commuter railroad and purchased the system.[12] Martin changed the name of North Pacific Coast Railroad to North Shore Railroad (NSRR) and began converting its narrow gauge track to standard gauge track, incorporating an additional "third rail" for electrification. The "third rail" method was the most efficient for transmission of the high-voltage electricity required to power the trains, and involved a third rail to run alongside the tracks. The "third rail" was mounted on

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[9] Fred A. Stindt, "Northwestern Pacific Railroad, Narrow Gauge," *Western Railroad* 31,2 (December 1968): 3.
[10] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.
[11] Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 31.
[12] Development of electrified urban streetcars dated to the 1860s but interurban transportation began in 1893 with a line between Portland, Oregon and Oregon City. In California, John Martin and Eugene de Sabla, Jr. pioneered the construction of high voltage transmission lines over long distances and were among the founders of the Pacific Gas & Electric Company. See: Coleman, *P.G.&E. of California*, 128-137.

wooden insulators and carried the electric current. A rod extended from under the rail car and connected to the power supply. Although efficient, the system posed considerable danger from electrocution and required insulated covers inside train stations and anywhere the rails might contact humans. The NSRR became the first, third-rail electric railway in California when the electric interurban began service in August 1903. Commuter trains ran between the passenger ferry terminal in Sausalito to Mill Valley along the path of the old North Pacific Coast Railroad. The first trip from Sausalito to San Rafael via electric train took place on September 19, 1903. In 1904, SPRR purchased the NSRR, which it consolidated into NWP in 1907.

From 1908 to 1914, the NWP completed numerous construction projects to modernize the line's southern end. The most significant was the 1.4-mile section of track constructed between Baltimore Park (now part of Larkspur) and Detour (historic community south of Corte Madera Creek on the NWP line) in 1909. This new section shifted the southern terminal from Point Tiburon to Sausalito for all through steam passenger service. Tiburon continued to be used as the freight loading station. The new line for passenger service now originated in Sausalito, followed a northwest track to Baltimore Park, turned northeast to Detour and connected to the old main line just south of Corte Madera Creek. Over the next several years NWP undertook numerous projects to update the line and improve operations, hoping to increase profits. One such project laid a second track between the Greenbrae Station and San Rafael Station, including the segment of track in the study area.[13]

At this time, the electric interurban route ran northwest from Sausalito to San Anselmo, then east to San Rafael, bypassing the Greenbrae/San Rafael segment. After the completion of the Baltimore Park-Detour cut off in 1909, electric train service continued to run over the Sausalito-San Anselmo-San Rafael route until 1924. During the early 1920s, track modifications on the Greenbrae/San Rafael segment included the completing the double tracking with the drawbridge and trestle over Corte Madera Creek at Greenbrae and double tracking Tunnel No. 3, all with the necessary third rail to power electric trains. After completion of double tracking in 1924, electric interurban passenger service was routed over the Baltimore Park-Detour cutoff and through to San Rafael over the Greenbrae/San Rafael segment.[14]

The introduction of electric interurban transportation replaced narrow gauge commuter passenger service throughout southern Marin County, although steam narrow gauge service, both freight and passenger, continued running the length of the line for several years. The 1906 earthquake and fire produced a short-lived expansion of the north coast timber industry, which was still serviced by old, narrow gauge lines; but as rebuilding wound down, freight revenues dropped off, and once again the line could not cover expenses. For efficiency, NWP converted more of its track to standard gauge. In 1910, NWP ended the narrow gauge freight car ferry transfer between Sausalito and San Francisco by removing the third rail from their freight car transporting ferries.[15]

Narrow gauge steam passenger service saw some revenue increases in the years after NWP consolidation. NWP continued the North Pacific Coast Railroad's marketing strategy in promoting the Redwood Coast as a resort destination to urban San Franciscans. NWP released an annual publication, "Vacation," which advertised the

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[13] Public Utilities Commission, "Profile and Alignment Mapping of the Northwestern Pacific Railway, Tiburon to Sonoma County Line, Marin County, California," October 3, 1912, Public Utilities Commission Records, California State Archives, Sacramento, California.
[14] Northwestern Pacific Railroad Company, "Authority for Expenditure/Executive Authority Records, Number 1484 and 1484 supplement," Northwestern Pacific Railroad Collection, California State Railroad Museum Library, Sacramento, California; "History of the Northwestern Pacific Railroad," 6-7; Paul Trimble, *Interurban Railways of the Bay Area* (Fresno: Valley Publishers, 1977), 67-76.
[15] "Northwestern Pacific Railroad: Narrow Gauge," 4-5.

many resorts and attractions to be found along the NWP redwood line. NWP marketed the "Triangle Trip," a course originating at the Sausalito ferry terminal, traveling northwest to Monte Rio, east along the Russian River to Fulton, then returning to Sausalito by way of Santa Rosa, Petaluma, and San Rafael, as one of the "finest sight-seeing Trips in the World."[16] Several additional trains were added between 1910 and 1914 during the summer months to meet the passenger increases. However, increased revenues did not balance costs on the aging line. By the mid-1920s the communities served by the narrow gauge steam line regularly complained about the old equipment and unsafe conditions, and in 1927 the California State Public Utilities Commission issued a report that outlined the bleak prospects of the narrow gauge line. The commission recommended the line be abandoned and services replaced by a motor bus with space for 15 passengers, 1500 pounds of freight, express and mail. By 1929 all remaining narrow gauge tracks running stream passenger trains had been abandoned.[17]

During the 1920s, increased use of automobile contributed to the drop in passenger patronage. Heavy annual losses caused Santa Fe to sell out to SPRR; in 1929, the SPRR purchased the Santa Fe's interest in the NWP for $4.6 million, and the NWP became solely a subsidiary of the SPRR.[18] The completion of the Golden Gate Bridge in 1937 provided an automobile connection between San Francisco and Marin County that led to the end of the passenger and freight ferry service and interurban rail transportation to the north bay counties of Marin, Sonoma, and Mendocino. The increasing popularity of automobile ownership, aging rolling stock, and the need for parent company SPRR to eliminate the money-losing commuter lines led the California Railroad Commission to permit abandonment of the interurban-ferryboat services to southern Marin County in 1941. The last electric interurban train in southern Marin County ran February 28, 1941. That same year, the southern terminal of NWP passenger operations shifted from Sausalito to San Rafael. In 1972 NWP ended all train service between Sausalito and San Rafael.[19]

Increased popularity of automobiles coupled with the economic hardships of the Depression contributed to a decline in the use of the NWP line between Willits and Arcata. Both freight and passenger service cut backs dictated branch line and main line closures. Although World War II provided a resurgence of use for the railroad, especially in freight movement, post-war prosperity resumed more cutbacks for NWP as car and truck travel grew. In May of 1942, NWP ended the day passenger service train to Eureka, and by 1958 a small train came through the Eel River Canyon only three times a week. That same year, NWP discontinued the train between San Rafael and Willits. By 1970, the midweek run was cancelled, with only a weekend schedule remaining. In 1984, SPRR sold the trackage from Willits north to Korblex to Eureka Southern Railroad, later named North Coast Railroad. In 1996, the North Coast Railroad and the former south end of the NWP became the Northwestern Pacific Railroad under public ownership.[20]

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[16] Northwestern Pacific Railroad advertising that appeared in the official time schedule dated August 1, 1912. Reprinted in: Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 52.

[17] "Northwestern Pacific Railroad: Narrow Gauge," 15. Trimble, *Interurban Railways of the Bay Area*, 5; "Obituaries, The Northwestern Pacific," *Pacific Traveler*, Railroad Issue, No. 54, October 1971, 8.

[18] Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 48, 54; Kneiss, *Redwood Railway*, 134; Northwestern Pacific Railroad, *Re-Driving of the Golden Spike: Northwestern Pacific Rail Service Restored After 1964 Flood Damage* (Northwestern Pacific Railroad Company, 1965), n.p

[19] Paul Trimble, *Interurban Railways of the Bay Area* (Fresno: Valley Publishers, 1977), 67-76.

[20] "Obituaries, The Northwestern Pacific," 8; Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 54-55; Northwestern Pacific Railroad Historical Society, webpage accessed on December 16, 2003. Page created August 29, 2000. Last updated February 13, 2001, http://www.NWPRRHS.ORG.

Table 1: Railroads Consolidated to Form the Northwestern Pacific Railroad and their Subordinate Lines

Railroads	Date Incorporated	Railroad Lines Absorbed and Year of Original Incorporation
San Francisco & North Pacific Railway	December 12, 1888	Contra Costa Steam Navigation Co., 1852 Petaluma & Haystack, 1862 San Francisco & Humboldt Bay Railroad, 1868 Sonoma County Railroad, 1868 San Francisco & North Pacific Rail Road Co., 1869 Sonoma & Marin Railroad, 1874 Sonoma Valley Prismoidal Railway, 1875 San Francisco & North Pacific Railroad, 1877 Fulton & Guerneville Railroad, 1877 Sonoma Valley Railroad, 1878, 1885 Sonoma & Santa Rosa Rail Road, 1881 San Francisco & San Rafael Rail Road, 1882 Marin & Napa Railroad, 1886 Cloverdale & Ukiah Rail Road, 1886 Santa Rosa, Sebastopol & Green Valley Railroad, 1889
California Northwestern Railway	March 17, 1898	
North Shore Railroad	January 11, 1902	San Rafael & San Quentin Rail Road, 1869 North Pacific Coast Railroad, 1871 North Pacific Coast Railroad Extension Co., 1882 North Western Railroad Co. of California, 1885 San Francisco, Tamalpais & Bolinas Railway, 1889
San Francisco & Northwestern Railway	May 12, 1903	Pacific Lumber Co., 1869 The Pacific Lumber Co., 1883 Eel River & Eureka Rail Road, 1882 California & Northern Railway, 1900 California Midland Railroad, 1902
Eureka & Klamath River Railway	January 6, 1896	Vance's Mad River Railroad, 1875 Humboldt Bay & Trinidad Logging & Lumber Co., 1891

The Northwestern Pacific Railroad between the California Park Hill Tunnel North Portal and the Northwestern Pacific Railroad Auburn Street Trestle

As stated previously, the first railroad track laid over this segment was constructed by San Francisco & San Rafael Railroad as part of the alignment built between Tiburon and San Rafael in 1884 to connect a standard gauge line to ferry service on San Francisco Bay. The line was a single track, approximately nine miles long.[21]

[21] "The Donahue Extension," *Marin County Journal*, October 25, 1884, page 2.

After NWP incorporated in 1907, the resulting projects to update the line's southern end included double tracking this segment. Now part of the main line for steam passenger service out of Sausalito and the main line for freight out of Tiburon, the line between Detour and San Rafael needed updating with double tracking. This was accomplished by 1913.[22] This segment of track again can under scrutiny in the 1920s during a general modernization of NWP resources. During 1924, NWP spent over $800,000 in Marin County on improvements, part of which included installing the electric interurban third rail system over the Baltimore Park-Detour cut-off and the section between Detour and San Rafael.[23] The last electric interurban train in southern Marin County ran February 28, 1941 and that same year, the southern terminal of NWP passenger operations shifted from Sausalito to San Rafael. No longer necessary, NWP removed both electric third rail and original 1884 track. Today, the segment between the California Park Hill Tunnel and the Auburn Street Trestle is an non-operational, single track alignment dating to approximately 1913.

Evaluation of the Northwestern Pacific Railroad segment between California Park Hill Tunnel and the Auburn Street Trestle

The following discussion presents an evaluation of the Northwestern Pacific Railroad segment in the study area under National Register and California Register criteria in a context as part of the entire line. The potential period of significance for the segment began at its construction in 1913 and continued until 1941, at which time NWP shifted its southern terminal for steam passenger service to San Rafael and ended electric interurban service throughout southern Marin County.

Criterion A (or 1): Railroads, with their associated tunnels, trestles and bridges are potentially significant under Criterion A if they are importantly associated with trends and/or events in transportation development regional or local economic development. Establishing significance, though, should be done with certain principles in mind. Railroads, like other transportation infrastructure, are inherently important to their communities as they substantially affect communication and the distribution of people, goods, and services that in turn affects development on both the local and regional levels. This impact does not typically provide sufficient evidence to demonstrate how a railroad line may be deemed significant for its association with an important historic context; otherwise virtually any railroad, with associated structures would be shown to be important in this way.

To be eligible for listing in the National Register, resource types such as railroads and other transportation infrastructure must have demonstrable importance directly related to important historic events and trends, with emphasis given to specific demand for such infrastructure, and its effects on social, economic, commercial, and industrial developments locally, regionally, or nationally. In this way, railroad lines and associated structures, may be significant as physical manifestations of important transportation and community developments on the local, regional, state, or national level.

The most common instance in which a railroad line or its separate structural components might be considered under Criterion A would be if the line was the first to be located at its site or into its service area, thus providing

[22] Public Utilities Commission, "Profile and Alignment Mapping . . . Tiburon to Sonoma County Line, Marin County, California," October 3, 1912.
[23] "Railroad Company Expends $800,000," *Marin County Journal*, October 2, 1924, page 8.

expanded transportation opportunity and advancing economic development into previously isolated or underdeveloped areas. This development trend is sometimes described as "ahead of demand" development, indicating the transportation route predated development, and subsequent development directly resulted from the presence of the transportation route. One such example of this development pattern would be the line Southern Pacific Railroad constructed down the length of California's San Joaquin Valley. While several towns connected by wagon road existed in the Central Valley, the placement of the new line initiated the development of a large number of towns along the new transportation route. These towns, now centers of population, exist because the railroad was built through a previously undeveloped area, which in turn opened a new area for economic development.

Railroad lines might also be considered significant under Criterion A if they were likely built to meet specific demands and resulted in immediate and / or substantial effects to a geographic location. While this level of importance typically can be associated with the initial transportation avenue at a particular location, in some cases it can be true of subsequent roads, railroad lines, or highways.

With these points in mind, the NWP does not appear to meet the guidelines of Criterion A. Incorporated in 1907, NWP was a consolidation of numerous lines built to meet a specific demand, to facilitate the movement of local products to a wider market, though their construction did not bring immediate or substantial effects to a geographic location. Throughout the nineteenth century, the north bay counties of Marin and Sonoma continually searched for ways to expand market potential for their local products. Because they were separated by water from San Francisco, their main market, connecting to water transportation was imperative. Farming communities established in the 1850s first hauled their goods over wagon roads to rivers that connected to the steam ferryboats, a system that existed on the San Francisco Bay from the early days of the gold rush. These early railroad lines were built to facilitate a process already occurring by other transportation methods. While one could argue that these predecessor lines were built to meet one specific demand, their construction did not bring an immediate or substantial effect to their geographic location. The original lines did not open new areas for development, but were rather an attempt from local citizens to use more modern transportation technology to improve existing access to market. In addition, the lines were not financially successful. Railroad entrepreneurs expected to turn a profit with their investments. Such was not the case in this area, as evidenced by the fact that approximately one-third of the companies that became part of the NWP never laid track. From a financial perspective, the predecessor lines of NWP were not a success.

The same can be said for NWP after incorporating in 1907. Formation of NWP occurred through the desire of the SPRR and Santa Fe to profit from the north coast timber industry freight market, and building a rail line connecting north coast lumber mills with the San Francisco shipping lines was long desired by the industry. Because of enormous costs, construction needed the financial backing of companies of the size of SPRR and Santa Fe. Even these two major railroads recognized that their financial interest dictated a merger rather than competition. Upon incorporation, NWP constructed the line through the Eel River canyon and opened through service to Eureka. However, the line between Willits and Eureka was finally completed in 1914, at the end of the age of railroad transport. The automobile was already having an impact on transportation trends and California was in the beginning stages of developing a state highway system.

Although the impetus for incorporating NWP was to move freight, mainly timber products, from the north coast lumber mills to a San Francisco market and distribution center, fluctuation in the timber industry required a broader approach to financial stability for NWP. Passenger service became the primary concern in the early years after incorporation. NWP ran a complicated network of narrow gauge local freight and passenger lines, standard gauge local freight and passenger lines, and electrified interurban standard gauge lines through established communities. NWP pursued an aggressive marketing program promoting recreation destinations and Marin County real estate, although they met with marginal success. Population statistics indicate a slight decrease in San Rafael's population between 1910 and 1920. In addition, although throughout Marin County, population increased during the 1910-1920 decade, increases were significantly below population increases in the San Francisco bay area counties. Population statistics do indicate a significant growth in population between 1920 and 1930 throughout Marin County, but increases were slightly below population increases in the San Francisco bay area counties. For example, while Marin County experienced a 60% increase in population between 1920 and 1930, Alameda County grew by more than 89%, San Mateo by over 100%, and Contra Costa County experienced a 75% increase in population.[24] This growth was perhaps enhanced by a generally developing infrastructure, but was not particularly attributable to NWP or its rehabilitation projects.

Marketing the Redwood Coast as a recreation destination and promoting Marin County real estate projects proved moderately successful in boosting revenues, but could not offset the financial loses of the freight service and electric railway. In inheriting the electric interurban system through consolidation, NWP faced a continual struggle to run a cost-effective and efficient line. NWP undertook massive updating projects to improve passenger service over the aging lines with realignment projects, rebuilding tunnels, trestles, and bridges, and replacing aging rolling stock. None of the measures proved effective. Heavy annual losses caused Santa Fe to sell out to SPRR in 1929. Continued losses prompted SRPP in abandon the electric interurban line. Throughout its history, NWP struggled to be profitable. This doe not suggest that the NWP was particularly influential in north bay development, certainly not in the way that other rail lines (such as the Southern Pacific Railroad line through the San Joaquin Valley) were in other areas of California.

As NWP does not appear to have opened new areas for social, economic, commercial, or industrial development, nor once built, did NWP appear to have in immediate and / or substantial effects to its surrounding geographic location, NWP does not appear to be eligible for listing in the National Register of Historic Places under Criterion A at either the local, state, or national level.

Examining a single segment of NWP for significance under Criterion A requires the evaluation consider the segment's association with historic events that have made a significant impact on history at the local, state, and national level. This segment, originally constructed in 1884, was one of many local railroads built in Marin County to provide transportation for both freight and local citizens to San Francisco. In this regard, the segment does not appear to be significant, as it was not the first rail line in the county and was not built for any reason other than to provide improved transportation for freight and passengers. Additionally, this alignment dates to 1913 when NWP double tracked the line between Detour and San Rafael as part of a general updating of resources. Thus the alignment was not the first on site. Therefore, this segment of NWP does not appear to be eligible for listing in the National Register of Historic Places under Criterion A at either the local, state, or national level.

[24] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.

Criterion B (or 2): Research did not suggest that NWP to have associations with persons who gained prominence in their professions or made significant contributions in local, state, or national history. While certain NWP predecessor lines appeared to have associations with persons who made significant contributions to our history, such as Peter Donahue, a prominent and influential San Francisco industrialist, John Martin and Eugene de Sabla, Jr., (pioneers in high voltage electric transmission) NWP does not best exemplify their significance in our history. These individuals are not importantly associated with the resource in their prominent capacity. Therefore NWP does not appear eligible under this criterion.

Criterion C or 3: No special engineering or construction techniques were known to be used in the construction of this rail segment. Thus it would not appear to meet the criteria for listing in the National Register of Historic Places under Criterion C.

Criterion D or 4: This criterion is usually reserved for archeological sites if they have yielded, or may likely yield, information important in pre-history or history. The property must have, or have had, information to contribute to our understanding of history, and the information must be considered important. However, this property is well documented in the historical record and thus would not appear to meet the criteria for listing in the National Register of Historic Places under Criterion D.

Integrity
Integrity of an historic resource is measured by application of seven factors: location, design, setting, workmanship, materials, feeling, and association. Integrity should be assessed on the basis of the period of significance for a property. A property's integrity should be specifically tied to its period of significance, a linkage that is derived from National Register guidelines and regulations. The property must retain integrity to its potential period of significance if it is to meet the criteria for listing in the National Register of Historic Places or as an important resource under California law and regulations.

This segment of NWP retains little integrity to its potential period of significance. The original 1884 track has been removed, as has the electric "third rail," both elements dating to the potential period of significance. In addition, numerous pressure-treated ties have replaced original ties. These changes compromise integrity of materials. The setting no longer retains sufficient integrity to the potential period of significance as numerous buildings have been constructed at grade along the east property edge, changing the setting from a rural area to one of a mix of commercial and light industrial. As the segment is no longer in use as a railroad, and has lost much of the railing, the feelings and association to the period of potential significance also lack integrity. Therefore, the segment does not appear to retain sufficient integrity to convey a sense of the property's historical significance necessary for listing in the National Register.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code 6

Other Listings
Review Code Reviewer Date

 ***Resource Name or #** (Assigned by recorder) Map Reference # 1

P1. Other Identifier: California Park Hill Tunnel

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** San Rafael **Date** 1980 **T** ___; **R** ___; __ ¼ **of Sec** ___; ______ **B.M.**
c. Address ______City _____Zip _____
d. UTM: (give more than one for large and/or linear resources) Zone ______; North Portal: 0543348mE/ 4200589mN
South Portal: 0543107mE/ 4200270mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Elevation, 70 feet.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The California Park Hill Tunnel is an 1104.6 foot long, circle arch tunnel beneath California Park Hill. The tunnel is approximately 30 feet wide by 24 feet high and extends beneath the hill in a north/south orientation, running parallel to Highway 101. The North Portal face is surfaced with board form, poured concrete. **(Photograph 1)** A frieze band extending the width of the North Portal façade is incised with 1924 incised over the tunnel crown. A two door, metal-framed gate blocks the entrance to the North Portal. Doors are covered with metal wire mesh supported by metal cross bracing. (See continuation sheet)

***P3b. Resource Attributes:** (List attributes and codes) (HP11) Tunnel
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Photograph 1, camera facing south, November 14, 2003.

***P6. Date Constructed/Age and Sources:** ☒ Historic ☐ Prehistoric ☐ Both
1924, NWP Company Records

***P7. Owner and Address:**
Marin County
3501 Civil Center Drive
San Rafael, California 94903

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert
JRP Historical Consulting
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** November 14, 2003

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") JRP Historical Consulting, "Historical Resources Inventory and Evaluation Report: Northwestern Pacific Railroad Segment, California Park Hill Railroad Tunnel Project," January 2004.

***Attachments:** NONE ☐ Location Map ☐ Sketch 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) ________

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
BUILDING, STRUCTURE, AND OBJECT RECORD

Primary # P-21-002618
HRI #

***NRHP Status Code** 6

***Resource Name or #** (Assigned by recorder) Map Reference # 1

B1. Historic Name: Tunnel Number 3 of the Northwestern Pacific Railroad

B2. Common Name: California Park Hill

B3. Original Use: Railroad Tunnel B4. Present Use: Tunnel (currently blocked)

***B5. Architectural Style:** Tunnel

***B6. Construction History:** (Construction date, alteration, and date of alterations) original tunnel constructed 1884; substantially widened and reconstructed in 1924, including widening approach cuts, retimbering, and addition of concrete portals, essentially replacing original tunnel; October 1990 fire collapsed crown at South Portal and approximately 140 feet within the tunnel; previous to June 1992 an eight foot section near the North Portal collapsed; 1995 repairs made to North Portal end.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown Date:** ______ **Original Location:** ______

***B8. Related Features:** ______

B9. Architect: N/A b. Builder: Northwestern Pacific Railroad

***B10. Significance: Theme** n/a **Area** n/a

Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The California Park Hill Tunnel does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be a historical resource for the purposes of CEQA. This tunnel does not appear to be significant for its association with historic events or trends in Marin County or in state or national history (Criterion A), nor is it associated with any known historic person (Criterion B). The resource does not embody distinctive engineering characteristics (Criterion C), nor will it likely yield information important to our history (Criterion D). In addition, the tunnel segment lacks integrity to its potential period of historic significance. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

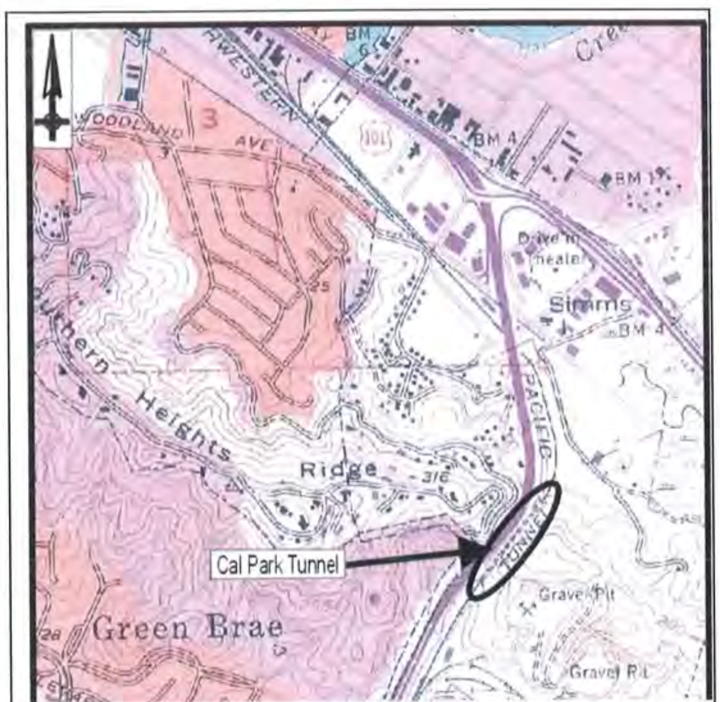
See footnotes, Significance, B10.

B13. Remarks:

***B14. Evaluator:** Rand Herbert, Cindy Toffelmier

***Date of Evaluation:** December 4, 2003

(This space reserved for official comments.)



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P3a. Description (continued):

Each door measures approximately 18 feet long by 13 feet wide. A concrete slab walkway covering the east edge of the former railroad alignment leads to the North Portal as seen in **Photograph 2**. Rails leading into the tunnel have been removed and area is covered with vegetation.

The South Portal, located directly adjacent and east of Highway 101, is also faced with board form, poured concrete. (**Photograph 3** and **4**) The frieze band extending the width of the South Portal façade is also incised with 1924, which is positioned over the tunnel crown. Tunnel opening is blocked by earth fill, which extends for a distance of approximately 140 feet into the tunnel. Rails leading into the tunnel have been removed and area is covered with overgrown vegetation.

Tunnel shoring consists of 12-inch by 14-inch vertical timber posts set in concrete with 4-inch by 14-inch timber posts set above main posts in a jointed, interlocking pattern that conforms to the tunnel arch. (**Photograph 5** and **6**) An eight-foot interior surface section near the North Portal is lined with cast-in-place reinforced concrete. A single track runs through the center of the tunnel floor.

B10. Significance (continued):

The California Park Hill Tunnel[1] (tunnel No. 3) is a 1924 tunnel built by Northwestern Pacific Railroad (NWP) on the site of an 1884 tunnel constructed by San Francisco & San Rafael Rail Road Company, one of the numerous railroads merged into NWP in 1907 by parent companies Southern Pacific Railway (SPRR) and the Atcheson, Topeka & Santa Fe Railroad (Santa Fe). Once consolidated, the NWP joined in the continuing development of the north bay and northern California counties of Marin, Sonoma, Napa, Mendocino and Humboldt transportation network. Following early wagon roads and proceeding modern highway construction, NWP, as was the case with all railroad development of the time, represented late nineteenth century and early twentieth century transportation trends for both passenger and freight transportation. However, new technology developed in the twentieth century greatly affected trends in transportation. To accommodate new technology, NWP regularly upgraded structures and railroad lines, such as use of electric powered trains. Tunnel No. 3 is one of numerous components of the NWP network modified to accommodate changing transportation trends. Even with routine upgrades, NWP struggled to stay competitive and solvent while serving Marin County residents with reasonably priced transportation into San Francisco. In the first decade of the twentieth century, the automobile began to emerge as a new mode of transportation in California, and soon thereafter an interconnected highway system largely replaced the railroad network that linked northern California coast counties with San Francisco. Not unique, NWP's struggle to remain profitable was a struggle faced by most railroad companies in the early twentieth century. This statement of significance will describe the development and decline of NWP in Marin County, from its nineteenth century freight and passenger rail service to twentieth century interurban passenger service and freight service to north bay and north coast counties. It will also address the significance of the California Park Hill Tunnel in the development of the NWP transportation network.

[1] The California Park Hill Tunnel has been known by a variety of names throughout its history. For the purposes of this report, the California Park Hill Tunnel will be referred to as Tunnel No. 3, which was its designation as the third tunnel in the northward progression of tunnels constructed along the main line of the Northwestern Pacific Railroad beginning from the line's origin at Point Tiburon.

Historical Context of Northwestern Pacific Railroad

The rail system in Marin County dates from the 1860s, when local entrepreneurs sought to develop a transportation network for both freight and passenger travel between the urban center of San Francisco and the increasingly populous Marin and Sonoma Counties. In the late 1850s, north bay communities were looking for more efficient, cost-effective ways to transport local goods to the San Francisco market. By 1860, Sonoma and Marin Counties had a combined population of over 15,000.[2] While farming occupied much of the developed north bay land, farms tended to be near population centers such as San Rafael, Petaluma, and Santa Rosa. San Rafael and Petaluma were served by steamboats. Wagons transported local products to central towns, then to river outlets, which connected north bay communities to San Francisco by steam ferry service. In April 1862 the California legislature granted Charles Minturn, who ran several steam-powered ferryboat enterprises around the San Francisco Bay, the right to build the Petaluma & Haystack Railroad. This first north bay steam-powered railroad ran the two and a half miles between Petaluma and Haystack Landing on Petaluma River, and connected with Minturn's steam powered ferryboats. Steamboats on the run were the *Clinton* and *Contra Costa*, small, single-ended boats that could navigate the river. Local goods still reached Petaluma by wagon road and were loaded onto railroad cars for transport to the river landing. There they were put onto the ferries, which were then sent to San Francisco shipping companies or local markets.[3]

Over the next twenty years, north bay communities sought way to improve local transportation. Citizens' groups funded construction of rail lines reaching further inland, attempting to reduce wagon transportation and use the more efficient rail car. Railroad construction was an expensive and largely financially unsuccessful process. Numerous locally-funded railroad companies organized, merged, and consolidated. In 1868, the Sonoma County Railroad Company incorporated for the purposes of building a line from Petaluma to Healdsburg via Santa Rosa. That same year Sonoma County Railroad Company merged with San Francisco & Humboldt Bay Railroad Company, which was organized in 1865 to build a railroad from Petaluma to Cloverdale. The company ran out of money after laying ten miles of track.[4] While the companies were not financially successful, they did manage to build miles of track, adding to the region's expanding steam railroad network.

In 1869, Peter Donahue, developer of the San Francisco & San Jose Railroad (the line now operated as Caltrain) and owner of several small railroad companies in California, organized the San Francisco & North Pacific Rail Road Company and joined with San Francisco & Humboldt Bay Railroad to complete a standard gauge line to Cloverdale.[5] In 1877, Donahue consolidated the San Francisco & North Pacific Rail Road, the Sonoma & Marin

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[2] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, "Welcome to California" website sponsored by the State of California, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS. Population statistic: Sonoma County, 11,867, Marin County, 3,334.

[3] John Haskell Kembel, *San Francisco Bay: A Pictorial Maritime History* (New York: Bonanza Books, 1957), 57; Fred A. Stindt and Guy L. Dunscomb, *The Northwestern Pacific Railroad, Redwood Empire Route* (Redwood City, CA: Fred A. Stindt, publisher, 1964), 10.

[4] Stindt and Dunscomb, *The Northwestern Pacific Railroad,*15.

[5] Peter Donahue came to San Francisco in 1849 and after a short stint in the gold fields, returned to San Francisco and opened a blacksmith shop, which was the beginning of the Union Iron Works, the first foundry in California. Locomotives and cars for Donahue's railroad lines were built in the Donahue foundry. Donahue, with his two brothers, was also the main force behind organizing the San Francisco Gas Company, the first gas utility company in California and the forerunner of Pacific, Gas & Electric Company. For a short

Railroad and the Fulton & Guerneville Railroad, all railroads in which Donahue held controlling interest, into the San Francisco & North Pacific Railroad (SF&NPRR). Since the days of the Petaluma & Haystack Railroad, Petaluma had been firmly established as the southern terminus for the expanding rail transportation in the north bay counties because of its connection with the steamboats operating on Petaluma River. The Petaluma River became increasingly difficult for boats to negotiate, so Donahue sought a more direct path to connect his railroad to his ferry services. By 1879, Donahue extended the SF&NPRR south into San Rafael, where the standard gauge track of the SF&NPRR connected with the narrow gauge San Rafael & San Quentin (SR&SQ), a shortline connecting San Rafael to Point San Quentin, where there had been steamboat ferry service into San Francisco since 1869. The transfer between the two lines required passengers and freight to off-load from one line, and be transported by stage or wagon the half-mile to the other line. This cumbersome arrangement proved unsatisfactory, especially to Donahue who wanted his rail line to connect to his steamboat ferry line. In 1882, Donahue organized the San Francisco & San Rafael Rail Road to build a standard gauge line between Point Tiburon and San Rafael, after which the new railroad would merge with the SF&NPRR. Donahue planned a new ferry terminal for Point Tiburon, which would become the new southern terminus for the SF&NPRR. Although the distance between San Rafael and Tiburon required only nine miles of track, the hilly terrain required construction of three tunnels, including the first tunnel constructed on the site of the present California Park Tunnel. The San Francisco & San Rafael Rail Road Company completed the nine-mile line between San Rafael and Tiburon on April 28, 1884, at a cost of $677,779.50. Tiburon became the permanent southern terminus of SF&NPRR and the point where passengers and cargo were transferred to ferries bound for San Francisco. In 1884, Donahue and the SF&NPRR controlled over 100 miles of railroad line through Marin and Sonoma Counties, and ran eight steam locomotives, ten passenger cars, three baggage, mail and express cars, and 222 freight cars.[6]

Donahue died on November 26, 1885, passing the control of the SF&NPRR to his son, J.M. Donahue, who continued expanding passenger and freight services. The railroad was sold at public auction upon J.M. Donahue's death in 1889 to A.W. Foster, Sydney V. Smith and Andrew Markham, who consolidated the SF&NPRR, Cloverdale & Ukiah Rail Road Company, San Francisco & San Rafael Rail Road, Marin & Napa Rail Road, Sonoma & Santa Rosa Rail Road, and Sonoma Valley Railroad into the San Francisco & North Pacific Railway Company. In 1898, the San Francisco & North Pacific Railway Company entered into a twenty-year lease agreement with the California Northwestern Railway Company, a newly incorporated entity whose backers were interested in connecting the Eureka, Humboldt County and Mendocino coastal timber regions with San Francisco Bay. The growing wood products industry of the north coast counties required a more efficient and cost effective method of moving timber and timber products than transport by ship. By 1902, the California Northwestern Railway Company laid its tracks as far north as Willits in Mendocino County.

The leaders of the Southern Pacific Railroad (SPRR), who up until this time considered north-coast railroad development unimportant, began to take an interest. Already well established in the Central Valley and the East Bay area with its western terminus in Oakland, the SPRR now considered north coast timber as a potentially lucrative addition to their freight business. Connecting the Eureka and Arcata area with San Francisco Bay

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biography of Peter Donahue see: Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company, 1852-1952*, (New York: McGraw-Hill Book Company, Inc., 1952). See also: Richard H. Dillon, *Iron Men: Peter, James, and Michael Donahue: California's Industrial Pioneers*, (Richmond, California: Candela Press, 1984).

[6] Stanley Borden, "History of the Northwestern Pacific Railroad," *Western Railroader* 12, 7 (May 1949), 3-5; Kemble, *San Francisco Bay*, 46.

became the objective. In 1902, SPRR took over a controlling interest in the California Northwestern Railway Company, and in 1903 incorporated the San Francisco & Eureka Railway Company with the goal of building 200 miles of track between Willits and Eureka. At the same time, the Santa Fe Railroad became interested in capturing the north coast timber freight market and organized the San Francisco & Northwestern Railway in May of 1903 to build a competing line between Eureka and San Francisco.[7]

These railroads planned to connect to existing lines around Eureka, which were first constructed around the Humboldt Bay region after 1875. Logging companies built short-line railroads to bring the lumber from the area's vast redwood forests to the mills centered in Eureka and Arcata. Eureka entrepreneur and mill owner John Vance opened the area's first railroad in 1875, which ran along Mad River Slough to Essex, north of Arcata. A private enterprise, the Mad River Railroad was purchased by Vance's nephews, Edgar and John Vance in 1891. In 1892, the Humboldt Bay & Trinidad Lumber & Logging Company purchased the line and incorporated it as the Eureka & Klamath River Railroad (E&KRR) in 1896. The E&KRR soon began work on a line connecting Eureka and Arcata.[8]

California & Northern Railroad (C&N), incorporated in 1901, took over the rail line construction of the Eureka to Arcata segment from the E&KRR, completing it on October 30, 1901. This line left the northern outskirts of Eureka and traveled east along the southeastern margin of Humboldt Bay, turning generally northeast around present day Brainard to Bracut. At Bracut, the line traveled directly north into Arcata, bypassing the small communities of Sunny Brae, Bayside, and Indianola, located on Old Arcata Road. Because the C&N did not have the money to begin operations, the Eel River & Eureka Railroad, a small line connecting the bay with the mills at Scotia, leased the C&N's line and in December of 1901 and began passenger and freight service between Eureka and Arcata. The Santa Fe took over most of these small lines and by 1905, the Santa Fe Railway owned over fifty miles of track in Northern California.[9]

By 1905 the SPRR and the Santa Fe realized the cost of constructing and operating competing lines into the Humboldt Bay region would be too high to make a profit. Rather than compete, the two companies consolidated. The result was the NWP, incorporated January 8, 1907, which consolidated the San Francisco & North Pacific Railway, California Northwestern Railway, the North Shore Railroad, San Francisco & Northwestern Railway, the Eureka & Klamath Railroad, Fort Bragg & Southeastern Railroad, and later, the San Francisco & Eureka Railway. The SPRR and Santa Fe engineers settled on a route through the main Eel River canyon. Because of the difficult terrain, construction proceeded slowly approximately twenty-five miles per year, and included construction of twenty-eight new tunnels. The NWP finally completed the line connecting Willits and Eureka in 1914.

Upon incorporation in 1907, the NWP set up in three divisions of steam powered operations. The Northern Division included the standard gauge area near Eureka. The standard gauge from Tiburon to Willits and associated branches became the Western Division. The narrow gauge lines of the former North Pacific

[7] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 15,48; Gilbert H. Kneiss, *Redwood Railways: A History of the Northwestern Pacific Railroad and Predecessor Line* (Berkeley: Howell-North Press, 1956), 130-132.
[8] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 38.
[9] "History of the Northwestern Pacific Railroad," 8-9.

Coast/North Shore Railroad were named the Shore Division. Within a few years, the company combined Western Division and Shore Division into the Southern Division.[10]

The Shore Division's narrow gauge lines built by the North Pacific Coast Railroad (NPCR) formed the basis for the early interurban travel in southern Marin County. The NPCR was incorporated in 1871 to build a narrow gauge track running steam trains north from the Sausalito Ferry Terminal to San Anselmo, a line which over the next thirty years extended north to Cazadero through consolidation of numerous companies incorporated to build short segments. NPCR's history was one of financial instability and frequent reorganization under a long line of changing ownership. Originally constructed to reach the timber communities of Marin and Sonoma counties, its tracks wound through Coast Redwood country. The economic decline in the 1890s resulted in a falling off of lumber and agricultural freight shipments. To generate revenues, NPCR joined with Marin County communities in an extensive marketing campaign to promote Marin County as a desirable alternative to San Francisco living. The scheme was not considered a success. Even though ridership increased, population statistics showed negligible increases for Marin County between the 1890 and 1900 census years.[11] Increased ticket sales reflected another marketing strategy promoted by the railroad during the early years of 1900s; NPCR marketed the "Redwood Empire" as a recreation destination for San Franciscans. Even though freight revenues declined, because of increased passenger ridership between 1892 and 1901, the NPCR showed a profit every year except 1896 and 1898.[12] In 1894, NPCR added a double-end ferry, the *Sausalito*, to augment their ferry service. The *Sausalito* was equipped to carry narrow gauge freight cars on the lower deck.

In 1902, a group of investors organized by John Martin and Eugene de Sabla, Jr. recognized the potential of the southern Marin County portion of the NPCR as a good choice for an electrified commuter railroad and purchased the system.[13] Martin changed the name of North Pacific Coast Railroad to North Shore Railroad (NSRR) and began converting its narrow gauge track to standard gauge track with a "third rail" method of electrification. This conversion required two extra rails: one to accommodate the standard gauge electric cars and another rail to carry the electricity. This method was the most efficient for transmission of the high-voltage electricity required to power the trains, and involved a third rail to run alongside the tracks. This "third rail," mounted on wooden insulators, carried the electric current. A rod extended from under the rail car and connected to the power supply. Although efficient, the system posed considerable danger from electrocution and required insulated covers inside train stations and anywhere the rails might contact humans. The NSRR became the first, third-rail electric railway in California when the electric interurban began service in August 1903. Commuter trains ran between the passenger ferry terminal in Sausalito to Mill Valley along the path of the old North Pacific Coast Railroad. The first trip from Sausalito to San Rafael via electric train took place on September 19, 1903. In 1904, SPRR purchased the NSRR, which it consolidated into the NWP in 1907.

From 1908 to 1914, the NWP completed numerous construction projects to modernize the line's southern end. The most significant was the 1.4 mile section of track constructed between Baltimore Park (now part of Larkspur)

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[10] Fred A. Stindt, "Northwestern Pacific Railroad, Narrow Gauge," *Western Railroad* 31,2 (December 1968): 3.

[11] "Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.

[12] Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 31.

[13] Development of electrified urban streetcars dated to the 1860s but interurban transportation began in 1893 with a line between Portland, Oregon and Oregon City. In California, John Martin and Eugene de Sabla, Jr. pioneered the construction of high voltage transmission lines over long distances and were among the founders of the Pacific Gas & Electric Company. See: Coleman, *P.G.&E. of California*, 128-137.

and Detour (historic community south of Corte Madera Creek on the NWP line) in 1909. This new section shifted the southern terminal from Point Tiburon to Sausalito for all through steam passenger service. Tiburon continued to be used as the freight loading station. The new line for passenger service now originated in Sausalito, followed a northwest track to Baltimore Park, turned northeast to Detour and connected to the old main line just south of Tunnel No. 3. Over the next several years NWP undertook numerous projects to update the line and improve operations, hoping to increase profits. One such project laid a second track between the Greenbrae Station and San Rafael Station, a section of track that included Tunnel No. 3. As the 1884 single-track tunnel was not wide enough to allow for a double track, engineers chose a Gauntlet Track system through Tunnel No. 3. A Gauntlet Track allowed both tracks to join at either end of the tunnel, which remained single tracked.[14]

At this time, the electric interurban route ran northwest from Sausalito to San Anselmo, then east to San Rafael, bypassing Tunnel No. 3. After the completion of the Baltimore Park-Detour cut off in 1909, electric train service continued to run over the Sausalito-San Anselmo-San Rafael route until 1924. During the early 1920s, track modifications on the Detour-San Rafael segment included the installation of a double track drawbridge over Corte Madera Creek at Greenbrae, a double track trestle, and double tracking Tunnel No. 3, all with the necessary third rail to power electric trains. After completion of double tracking in 1924, electric interurban passenger service was routed over the Baltimore Park-Detour cutoff and through Tunnel No. 3 to San Rafael.[15]

The introduction of electric interurban transportation replaced narrow gauge commuter passenger service throughout southern Marin County, although steam narrow gauge service, both freight and passenger, continued running the length of the line for several years. The 1906 earthquake and fire produced a short-lived expansion of the north coast timber industry, which was still serviced by old, narrow gauge lines; but as rebuilding wound down, freight revenues dropped off, and once again the line could not cover expenses. For efficiency, NWP converted more of its track to standard gauge. In 1910, NWP ended the narrow gauge freight car ferry transfer between Sausalito and San Francisco by removing the third rail from their freight car transporting ferries.[16]

Narrow gauge steam passenger service saw some revenue increases in the years after NWP consolidation. NWP continued the North Pacific Coast Railroad's marketing strategy in promoting the Redwood Coast as a resort destination to urban San Franciscans. NWP released an annual publication, "Vacation," which advertised the many resorts and attractions to be found along the NWP redwood line. NWP marketed the "Triangle Trip," a course originating at the Sausalito ferry terminal, traveling northwest to Monte Rio, east along the Russian River to Fulton, then returning to Sausalito by way of Santa Rosa, Petaluma, and San Rafael, as one of the "finest sight-seeing Trips in the World."[17] Several additional trains were added between 1910 and 1914 during the summer months to meet the passenger increases. However, increased revenues did not balance costs on the aging line. By the mid-1920s the communities served by the narrow gauge steam line regularly complained about the old equipment and unsafe conditions, and in 1927 the California State Public Utilities Commission issued a report that

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[14] Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 53; Public Utilities Commission, "Profile and Alignment Mapping of the Northwestern Pacific Railway, Tiburon to Sonoma County Line, Marin County, California," October 3, 1912, Public Utilities Commission Records, California State Archives, Sacramento, California.

[15] Northwestern Pacific Railroad Company, "Authority for Expenditure/Executive Authority Records, Number 1484 and 1484 supplement," Northwestern Pacific Railroad Collection, California State Railroad Museum Library, Sacramento, California; "History of the Northwestern Pacific Railroad," 6-7; Paul Trimble, *Interurban Railways of the Bay Area* (Fresno: Valley Publishers, 1977), 67-76.

[16] "Northwestern Pacific Railroad: Narrow Gauge," 4-5.

[17] Northwestern Pacific Railroad advertising that appeared in the official time schedule dated August 1, 1912. Reprinted in: Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 52.

outlined the bleak prospects of the narrow gauge line. The commission recommended the line be abandoned and services replaced by a motor bus with space for 15 passengers, 1500 pounds of freight, express and mail. By 1929 all remaining narrow gauge tracks running stream passenger trains had been abandoned.[18]

During the 1920s, increased use of automobile contributed to the drop in passenger patronage. Heavy annual losses caused Santa Fe to sell out to SPRR; in 1929, the SPRR purchased the Santa Fe's interest in the NWP for $4.6 million, and the NWP became solely a subsidiary of the SPRR.[19] The completion of the Golden Gate Bridge in 1937 provided an automobile connection between San Francisco and Marin County that led to the end of the passenger and freight ferry service and interurban rail transportation to the north bay counties of Marin, Sonoma, and Mendocino. The increasing popularity of automobile ownership, aging rolling stock, and the need for parent company SPRR to eliminate the money-losing commuter lines led the California Railroad Commission to permit abandonment of the interurban-ferryboat services to southern Marin County in 1941. The last electric interurban train in southern Marin County ran February 28, 1941. That same year, the southern terminal of NWP passenger operations shifted from Sausalito to San Rafael, bypassing Tunnel No. 3. In 1972 NWP ended all train service between Sausalito and San Rafael.[20]

Increased popularity of automobiles coupled with the economic hardships of the Depression contributed to a decline in the use of the NWP line between Willits and Arcata. Both freight and passenger service cut backs dictated branch line and main line closures. Although World War II provided a resurgence of use for the railroad, especially in freight movement, post-war prosperity resumed more cutbacks for NWP as car and truck travel grew. In May of 1942, NWP ended the day passenger service train to Eureka, and by 1958 a small train came through the Eel River Canyon only three times a week. That same year, NWP discontinued the train between San Rafael and Willits. By 1970, the midweek run was cancelled, with only a weekend schedule remaining. In 1984, SPRR sold the trackage from Willits north to Korblex to Eureka Southern Railroad, later named North Coast Railroad. In 1996, the North Coast Railroad and the former south end of the NWP became the Northwestern Pacific Railroad under public ownership.[21]

Table 1: Railroads Consolidated to Form the Northwestern Pacific Railroad and their Subordinate Lines

Railroads	Date Incorporated	Railroad Lines Absorbed and Year of Original Incorporation
San Francisco & North Pacific Railway	December 12, 1888	Contra Costa Steam Navigation Co., 1852 Petaluma & Haystack, 1862 San Francisco & Humboldt Bay Railroad, 1868

[18]"Northwestern Pacific Railroad: Narrow Gauge," 15. Trimble, *Interurban Railways of the Bay Area*, 5; "Obituaries, The Northwestern Pacific," *Pacific Traveler*, Railroad Issue, No. 54, October 1971, 8.
[19]Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 48, 54; Kneiss, *Redwood Railway*, 134; Northwestern Pacific Railroad, *Re-Driving of the Golden Spike: Northwestern Pacific Rail Service Restored After 1964 Flood Damage* (Northwestern Pacific Railroad Company, 1965), n.p
[20] Paul Trimble, *Interurban Railways of the Bay Area* (Fresno: Valley Publishers, 1977), 67-76.
[21] "Obituaries, The Northwestern Pacific," 8; Stindt and Dunscomb, *The Northwestern Pacific Railroad*, 54-55; Northwestern Pacific Railroad Historical Society, webpage accessed on December 16, 2003. Page created August 29, 2000. Last updated February 13, 2001, http://www.NWPRRHS.ORG.

		Sonoma County Railroad, 1868 San Francisco & North Pacific Rail Road Co., 1869 Sonoma & Marin Railroad, 1874 Sonoma Valley Prismoidal Railway, 1875 San Francisco & North Pacific Railroad, 1877 Fulton & Guerneville Railroad, 1877 Sonoma Valley Railroad, 1878, 1885 Sonoma & Santa Rosa Rail Road, 1881 San Francisco & San Rafael Rail Road, 1882 Marin & Napa Railroad, 1886 Cloverdale & Ukiah Rail Road, 1886 Santa Rosa, Sebastopol & Green Valley Railroad, 1889
California Northwestern Railway	March 17, 1898	
North Shore Railroad	January 11, 1902	San Rafael & San Quentin Rail Road, 1869 North Pacific Coast Railroad, 1871 North Pacific Coast Railroad Extension Co., 1882 North Western Railroad Co. of California, 1885 San Francisco, Tamalpais & Bolinas Railway, 1889
San Francisco & Northwestern Railway	May 12, 1903	Pacific Lumber Co., 1869 The Pacific Lumber Co., 1883 Eel River & Eureka Rail Road, 1882 California & Northern Railway, 1900 California Midland Railroad, 1902
Eureka & Klamath River Railway	January 6, 1896	Vance's Mad River Railroad, 1875 Humboldt Bay & Trinidad Logging & Lumber Co., 1891

The California Park Hill Tunnel, Tunnel No. 3

As stated previously, the first tunnel constructed on the site of the California Park Hill Tunnel was one of three tunnels Peter Donahue's San Francisco & San Rafael Railroad built between Tiburon and San Rafael in 1884 to connect a standard gauge line to ferry service on San Francisco Bay. The line was a single track, approximately nine miles long. Of the three original tunnels built on this nine-mile section, the California Park Hill Tunnel, Tunnel No. 3, was the only to include any untimbered interior surfaces. As originally built, the 1094 feet long tunnel had approximately 353 feet of untimbered surface.[22]

After NWP incorporated in 1907, the resulting projects to update the line's southern end included Tunnel No. 3. Now part of the main line for steam passenger service out of Sausalito and the main line for freight out of Tiburon, the line between Detour and San Rafael, including Tunnel No. 3, needed updating with double tracking. The engineers chose a Gauntlet track for Tunnel No. 3. A Gauntlet track is a way of overlapping two separate

[22] "The Donahue Extension," *Marin County Journal*, October 25, 1884, page 2.

tracks through a restricted space. Tracks leading into and out of tunnel portals are double track but through the tunnel section tracks are overlapping, creating four rails in close proximity. Operationally, a gauntlet section acts like a single track, as trains cannot run over the two tracks simultaneous.[23]

Tunnel No. 3's capacity and condition again came under scrutiny in the 1920s during a general modernization of NWP resources. During 1924, NWP spent over $800,000 in Marin County on improvements. Tunnel No. 3 underwent extensive changes. NWP officials wanted to route interurban electric trains over the Baltimore Park-Detour cut-off which required electrifying the section between Detour and San Rafael, including Tunnel No. 3. Because of its placement on both the main line for freight traffic originating out of Tiburon and the main line for passenger service originating out of Sausalito, Tunnel No. 3 had to accommodate large box freight cars and an interurban electric line. The Gauntlet track was no longer an adequate solution.

NWP officials ordered tunnel reconstruction projects to include widening approach cuts, new wood portals, and construction of a second track through the tunnel. Work was to commence in October 1923 at the close of the summer traffic season. Original estimates took into account that a large portion of the tunnel would require no timber lining, an estimate based on existing tunnel conditions where close to 50 percent of the tunnel was untimbered. Once excavation began, unstable soil conditions dictated the need to timber old untimbered sections, resulting in a complete retimbering of the tunnel with timbers placed on concrete footings. Increased approach cuts created heavy end pressure on the portal requiring replacement of timber structures with concrete portals. The reconstruction of Tunnel No. 3 required a total of $208,021 to complete. The project was completed in July 1924. After construction, tunnel No. 3 was approximately 1100 feet long, 30 feet wide, and 24 feet high at the crown.[24]

In October 1990 a fire consumed some of the tunnel's timbers and collapsed the crown at the South Portal, along with a 140-foot section extending into the tunnel. To stop the fire, crews plugged the North Portal and the sinkhole above the South Portal with earth fill. An October 1991 inspection revealed that in addition to the 140 feet of collapsed tunnel, there was also fire damage to approximately 465 linear feet of the timber lining. Between October 1991 and June 1992 an eight-foot long section of tunnel collapsed near the North Portal. Crews repaired this collapsed section in 1995, removing the North Portal blockage and applying cast-in-place reinforced concrete lining to the walls of the eight-foot section for added structural support.

Railroad Tunnels as a Resource Type

The NWP main line included forty tunnels. Added to this number were five additional tunnels along the old narrow gauge route between Sausalito and Cazadero and two tunnels on a narrow gauge route abandoned in 1884. Of the forty main line tunnels, ten were originally built in the nineteenth century with another two constructed before NWP incorporation in 1907. Of these twelve tunnels, ten were constructed in the southern stretch between Tiburon and Willits. Tunnel numbers 1-3 were built by the San Francisco & San Rafael Rail Road and incorporated into the San Francisco & North Pacific Rail Road upon completion. The San Francisco & North Pacific Rail Road built Tunnel No. 4 in 1879. The Cloverdale & Ukiah Rail Road constructed Tunnels 5-9 in

[23]Craig Dewick, "Possum Power Tank's Great Australian Railroad FAQ, What is a Gauntlet Track?" Website accessed November 28, 2003http://lios.apana.org.au/~craigd/ppt_faq/faq2.html; Public Utilities Commission, "Profile and Alignment Mapping . . . Tiburon to Sonoma County Line, Marin County, California," October 3, 1912.
[24]Northwestern Pacific Railroad, "Authority for Expenditure/Executive Authority Records, Number 1484 and 1484 supplement."

1889 and California Northwestern Railway constructed the last, Tunnel No. 10, in 1902. The remaining two represent construction south from Eureka. The Eel River & Eureka Railroad constructed Tunnel No. 40 in 1884 and San Francisco & Northwestern Railway completed tunnel No. 39 in 1904. NWP constructed twenty-eight tunnels between 1910 and 1914 to complete the north / south connection between Willits and Shively. Most have undergone some form of reconstruction such as widening, timber replacement, concrete reinforcing, or new tracking.[25]

Tunnels range in length from 106.5 feet long (Tunnel No. 23, constructed in 1913) to 4,313.1 feet long (Tunnel No. 27, constructed in 1913). Thirty-one tunnels are less than 1,000 feet long. Seven tunnels are longer than Tunnel No. 3. Eight of the tunnels on NWP main line have timber lining without concrete reinforcing. The remaining thirty-two tunnels combine concrete with timber lining. Tunnel No. 3 is among this number. One tunnel has one rock portal and one timber portal. Ten of the tunnels have timber portals. Eighteen tunnels have one portal of concrete and one of timber. Tunnel No. 3 is among the eight tunnels that have two concrete portals.[26]

Evaluation of the California Park Hill Tunnel, Tunnel No. 3 of the Northwestern Pacific Railroad

The following discussion presents an evaluation of the California Park Hill Tunnel (Tunnel No.3) under National Register and California Register criteria. Examining a single structural element of NWP for significance under Criterion A, as in the case of Tunnel No. 3, requires the evaluation consider its context as an element in the entire line as well as an individual structure. As an element in NWP, Tunnel No. 3 is part of a vast number of elements contributing to the larger NWP system, which included over 570 miles of track, 47 tunnels, 62 bridges in excess of 300 feet, 57 trestles in excess of 300 feet, and numerous smaller trestles of varying designs. Collectively, all of these elements served important functions to the total NWP system. This context requires an evaluation of the entire NWP in order to determine significance for individual elements. As an individual structure, the potential period of significance for the California Park Hill Tunnel began in 1924, when reconstruction essentially replaced the original tunnel constructed in 1884 and opened it for through steam freight, steam passenger and electric interurban commuter traffic. The tunnels potential period of significance continued until 1941, at which time NWP shifted its southern terminal for steam passenger service to San Rafael, bypassing Tunnel No. 3 and ended electric interurban service throughout southern Marin County.

Criterion A (or 1): Railroads, with their associated tunnels, trestles and bridges are potentially significant under Criterion A if they are importantly associated with trends and/or events in transportation development regional or local economic development. Establishing significance, though, should be done with certain principles in mind. Railroads, like other transportation infrastructure, are inherently important to their communities as they substantially affect communication and the distribution of people, goods, and services that in turn affects development on both the local and regional levels. This impact does not typically provide sufficient evidence to demonstrate how a railroad line may be deemed significant for its association with an important historic context; otherwise virtually any railroad, with associated structures would be shown to be important in this way.

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[25] Authority for Expenditure Records provide evidence that most tunnels underwent some form of reconstruction during the period between 1921-1929. See: Authority for Expenditure/Executive Authority Records, Northwestern Pacific Railroad Collection, California State Railroad Museum Library, Sacramento, California.

[26] NWP Main Line Tiburon-Eureka Tunnel statistics compiled by Fred A. Stindt and appear in Stindt and Dunscomb, *The Northwestern Pacific Railroad,* 119.

To be eligible for listing in the National Register, resource types such as railroads and other transportation infrastructure must have demonstrable importance directly related to important historic events and trends, with emphasis given to specific demand for such infrastructure, and its effects on social, economic, commercial, and industrial developments locally, regionally, or nationally. In this way, railroad lines and associated structures, may be significant as physical manifestations of important transportation and community developments on the local, regional, state, or national level.

The most common instance in which a railroad line or its separate structural components might be considered under Criterion A would be if it either the line or separate components (tunnels, trestles, or bridges) were the first to be located at its site, thus providing expanded transportation opportunity and advancing economic development into previously isolated or underdeveloped areas. This development trend is identified as "ahead of demand" development, indicating the transportation route predated development and subsequent development directly related to the presence of the transportation route. One such example of this development pattern would be the line Southern Pacific Railroad constructed down the length of California's San Joaquin Valley. While several towns connected by wagon road existed in the Central Valley, the placement of the new line away from the wagon road initiated the development of a large number of new towns along the new transportation route. These towns, now centers of main populations, exist because the railroad was built through a previously undeveloped area, which in turn opened a new area for economic development.

Railroad lines might also be considered significant under Criterion A if they were likely built to meet specific demands and resulted in immediate and / or substantial effects to a geographic location. While this level of importance typically can be associated with the initial transportation avenue at a particular location, in some cases it can be true of subsequent roads, railroad lines, or highways.

With these points in mind, the California Park Hill Tunnel, as a component of the NWP, does not appear to meet the guidelines of Criterion A. Incorporated in 1907, NWP was a consolidation of numerous lines built to meet a specific demand, to facilitate the movement of local products to a wider market, though their construction did not bring immediate or substantial effects to a geographic location. Throughout the nineteenth century, the north bay counties of Marin and Sonoma continually searched for ways to expand market potential for their local products. Because they were separated by water from San Francisco, their main market, connecting to water transportation was imperative. Farming communities established in the 1850s first hauled their goods over wagon roads to rivers that connected to the steam ferryboats, a system that existed on the San Francisco Bay from the early days of the gold rush. The early railroad lines were built to facilitate a process already occurring by other transportation methods. While one could argue that these predecessor lines were built to meet one specific demand, their construction did not bring an immediate or substantial effect to their geographic location. The original lines did not open new areas for development, but were rather an attempt from local citizens to use more modern transportation technology to improve existing access to market. In addition, the lines were not financially successful. Railroad entrepreneurs expected to turn a profit with their investments. Such was not the case in this area, as evidenced by the fact that approximately one-third of the companies that became part of the NWP never laid track. From a financial perspective, the contributing lines of NWP were not a success.

The same can be said for NWP after incorporating in 1907. Formation of NWP occurred through the desire of the SPRR and Santa Fe to profit from the north coast timber industry freight market, and building a rail line connecting north coast lumber mills with the San Francisco shipping lines was long desired by the industry. Because of enormous costs, construction needed the financial backing of companies of the size of SPRR and Santa Fe. Even these two major railroads recognized that their financial interest dictated a merger rather than competition. Upon incorporation, NWP constructed the line through the Eel River canyon and opened through service to Eureka. However, the line between Willits and Eureka was finally completed in 1914, at the end of the age of railroad transport. The automobile was already having an impact on transportation trends and California was in the beginning stages of developing a state highway system.

Although the impetus for incorporating NWP was to move freight, mainly timber products, from the north coast lumber mills to a San Francisco market and distribution center, fluctuation in the timber industry required a broader approach to financial stability for NWP. Passenger service became the primary concern in the early years after incorporation. Upon incorporation, NWP ran a complicated network of narrow gauge local freight and passenger lines, standard gauge local freight and passenger lines, and electrified interurban standard gauge lines through established communities. NWP pursued an aggressive marketing program promoting recreation destinations and Marin County real estate. Population statistics indicate a significant growth in population between 1920 and 1930 (the decade in which Tunnel No. 3 underwent reconstruction) throughout Marin County, but increases were slightly below population increases in the San Francisco bay area counties. For example, while Marin County experienced a 60% increase in population between 1920 and 1930, Alameda County grew by more than 89%, San Mateo by over 100%, and Contra Costa County experienced a 75% increase in population.[27] This growth was perhaps enhanced by a generally developing infrastructure, but was not particularly attributable to NWP or its rehabilitation projects.

Marketing the Redwood Coast as a recreation destination and promoting Marin County real estate projects proved moderately successful in boosting revenues, but could not offset the financial loses of the freight service and electric railway. In inheriting the electric interurban system through consolidation, NWP faced a continual struggle to run a cost-effective and efficient line. NWP undertook massive updating projects to improve passenger service over the aging lines with realignment projects, rebuilding tunnels, trestles, and bridges, and replacing aging rolling stock. None of the measures proved effective. Heavy annual losses caused Santa Fe to sell out to SPRR in 1929. Continued losses prompted SRPP in abandon the electric interurban line. Throughout its history, NWP struggled to be profitable. This does not suggest that the NWP was particularly influential in north bay development, certainly not in the way that other rail lines (such as the Southern Pacific Railroad line through the San Joaquin Valley) were in California.

As NWP does not appear to have opened new areas for social, economic, commercial, or industrial development, nor once built did NWP appear to have in immediate and / or substantial effects to its surrounding geographic location, NWP does not appear to be eligible for listing in the National Register of Historic Places under Criterion A at either the local, state, or national level.

Examining a single structural element of NWP for significance under Criterion A, as in the case of Tunnel No. 3, requires the evaluation consider its context as a part of the entire line. The tunnel may be significant if its construction caused new areas to open for development, or its construction brought immediate and / or substantial effects to a geographic location. Such is not the case with Tunnel No. 3. Tunnel No. 3, constructed in 1924,

[27]"Historical Census Population of Places, Towns, and Cities in California, 1850-1990," accessed online December 17, 2003, http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS.

followed the original 1884 tunnel built on the site. The earlier tunnel was part of the San Francisco & San Rafael Rail Road's efforts to create a more direct connection for freight and passenger travel to San Francisco. The construction of the earlier tunnel did not appear to open the surrounding area for development, as San Rafael, incorporated in 1874, had been an established population center since the Mexican era and connected to San Francisco ferry service since 1869.

The 1924 tunnel reconstruction required concrete portals and interior retimbered to support double tracking and the addition of an electric "third rail," thus essentially replacing the previous tunnel and updating an aging and obsolete structure. Construction of Tunnel No. 3 did not aid in developing the surrounding area, which had been established for several decades. Moreover, Tunnel No. 3 is a single element of the NWP. Individually, any one element is part of a vast number of elements contributing to the larger NWP system, which included over 570 miles of track, 62 bridges in excess of 300 feet, 57 trestles in excess of 300 feet, numerous smaller trestles, as well as 47 tunnels. Collectively, all of these elements served important functions to the total NWP system. By itself, Tunnel No. 3 would not be considered sufficiently significant to appear to be eligible for listing in the National Register of Historic Places under Criterion A at either the local, state, or national level.

Criterion B (or 2): Research did not suggest the California Park Hill Tunnel or NWP to have associations with persons who gained prominence in their professions or made significant contributions in local, state, or national history. While certain NWP predecessor lines appeared to have associations with persons who made significant contributions to our history, such as Peter Donahue, a prominent and influential San Francisco industrialist, John Martin and Eugene de Sabla, Jr., (pioneers in high voltage electric transmission) the tunnel or the NWP are not structures that best exemplify their significance in our history. These individuals are not importantly associated with the resource in their prominent capacity. Therefore NWP and California Park Hill Tunnel do not appear eligible under this criterion.

Criterion C (or 3): The California Park Hill Tunnel is a structure of common design that represented no particular engineering achievement at the time it was constructed. At 1104.6 feet long, the California Park Hill Tunnel represents neither a significantly long tunnel among the tunnels of the NWP. Seven of the main line tunnels are longer, and 31 are shorter in length. The original tunnel constructed in 1884 was a timber-lined tunnel with timber-supported portals, a common construction method of this period. The reconstruction project undertaken in 1924 widened the tunnel and retimbered the interior support structure. Concrete portals and some concrete tunnel lining were added at this time, which was also common also for the period. Thirty-two of NWP tunnels combined concrete with timber lining. The portals on eight of the tunnels are constructed concrete. Nothing in the construction of Tunnel No. 3 suggests that it was designed and built through anything other than standard processes. Thus it would not appear to meet the criteria for listing in the National Register of Historic Places under Criterion C.

Criterion D (or 4: This criterion is usually reserved for archeological sites if they have yielded, or may likely yield, information important in pre-history or history. The property must have, or have had, information to contribute to our understanding of history, and the information must be considered important. However, this property is well documented in the historical record and thus would not appear to meet the criteria for listing in the National Register of Historic Places under Criterion D.

c

Page 16 **of** 19 ***Resource Name or #** (Assigned by recorder) Map Reference # 1
***Recorded by** Rand Herbert *Date November 14, 2003 ☒ Continuation ☐ Update

Integrity

Integrity of an historic resource is measured by application of seven factors: location, design, setting, workmanship, materials, feeling, and association. Integrity should be assessed on the basis of the period of significance for a property. A property's integrity should be specifically tied to its period of significance, a linkage that is derived from National Register guidelines and regulations. The property must retain integrity to its potential period of significance if it is to meet the criteria for listing in the National Register of Historic Places or as an important resource under California law and regulations.

Although a large percentage of the structural timber of the tunnel remains in place, the California Park Hill Tunnel has not retained a high level of integrity in the seven measures when evaluated in the context of its period of significance. Fire damage to approximately 465 linear feet of the timber lining structure and added cast-in-place reinforced concrete lining to the walls have compromised the structural integrity of the original reconstruction of 1924. The collapsed crown of the South Portal and the resulting 140-foot long collapse into the tunnel further damaged structural timber. The double track system with additional third electric rail for which the original tunnel was restructured to accommodate in 1924 has been removed and replaced with a single track.

C

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-21-002618
HRI #
Trinomial

 *Resource Name or # (Assigned by recorder) Map Reference # 1
*Recorded by Rand Herbert *Date November 14, 2003 ☒ Continuation ☐ Update

Photographs (cont):

Photograph 2, North Portal, camera facing south, November 14, 2003.

Photograph 3, South Portal, camera facing northeast, November 14, 2003.

c

 *Required Information

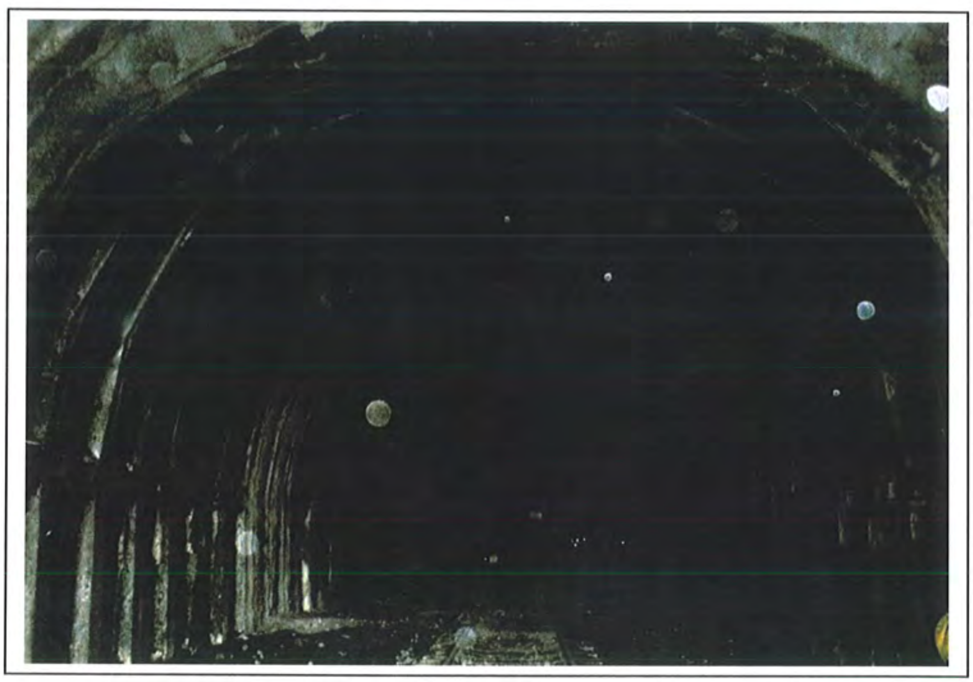
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-21-002618
HRI #
Trinomial

*Resource Name or # (Assigned by recorder) Map Reference # 1
*Recorded by Rand Herbert *Date November 14, 2003 ☒ Continuation ☐ Update

Photographs (cont):

Photograph 4, South Portal, camera facing north, November 14, 2003.



Photograph 5, Tunnel interior, camera facing south, November 14, 2003.

C

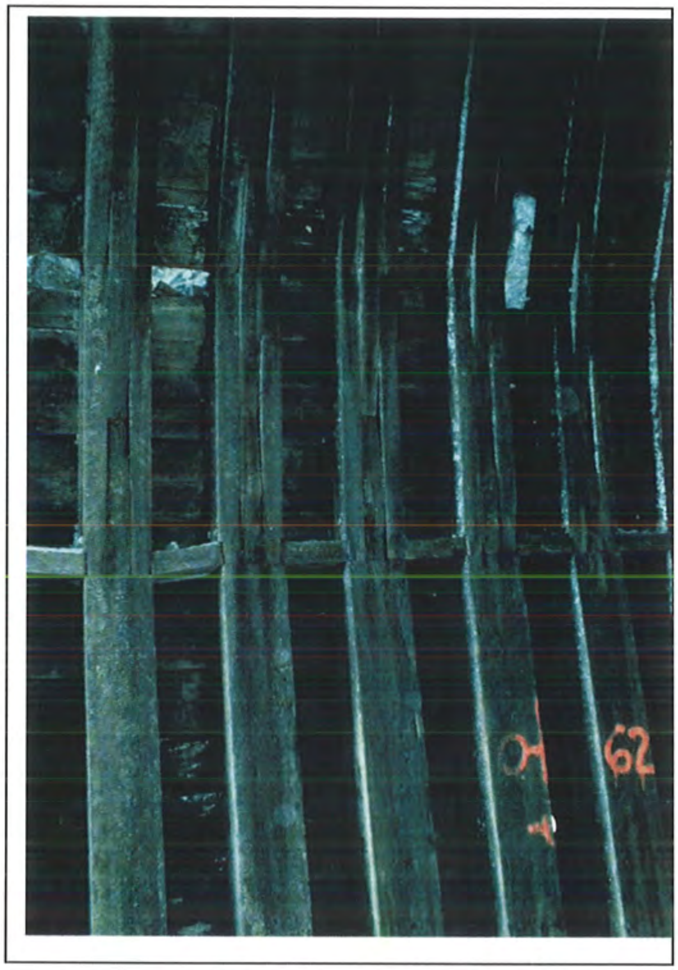
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-21-002618
HRI #
Trinomial

***Resource Name or #** (Assigned by recorder) Map Reference # 1

***Recorded by** Rand Herbert *Date November 14, 2003 ☒ Continuation ☐ Update

Photographs (cont):



Photograph 6, Timber shoring, November 14, 2003.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code ______ Reviewer ______________ Date

 ***Resource Identifier** (Assigned by recorder): Footing 13

P1. Other Identifier:

***P2. Location:** ☒ Not for Publication ☐ Unrestricted ☐ **a. County:** Marin

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Novato **Date:** 1954 pr 1980 **T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section** (San Jose Pacheco Rancho)

c. Address City Zip

d. UTM: Zone 10, 541133mE/4212750mN

e. Other Locational Data: From Hwy 101 north, take the Bel Marin Keys exit. Take an immediate right on Bel Marin Keys. From the intersection of Bel Marin Keys and the railroad tracks, follow the tracks south approximately 400 feet.

***P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):**
Footing 13 is a concrete footing with graffiti on it. It measures approximately 18 x 24 inches and is 20 inches tall. Four bolts extend upright out of the corners of the footing with a slightly depressed rectangular indention between the bolts. The footing was painted white at one time. It rests approximately 6 feet west of the railroad tracks. This footing is associated with the railroad, but the function is unknown.

***P3b. Resources Attributes: (list attributes and codes) : AH2** Foundations/structure pads

***P4. Resources Present:** ☐ **Building** ☐ **Structure** ☒ **Object** ☒ **Site** ☐ **District** ☐ **Element of District** ☐ **Other (Isolates, etc.)**

P5a.

***P5b. Description of Photo: Footing 13, view to west, 4/03**

***P6. Date Constructed/Age and Source:**
☐ **Prehistoric** ☒ **Historic** ☐ **Both**

***P7. Owner and Address:**
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

***P8. Recorded by (Name, affiliation, and address):**
Jim Jenks
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

***P9. Date Recorded: 4/03**

***P10. Type of Survey: Describe:** intensive pedestrian

***P11. Report Citation (Cite survey report and other sources, or enter "none."):**

Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

b.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-21-002618
HRI #

LOCATION MAP

Trinomial

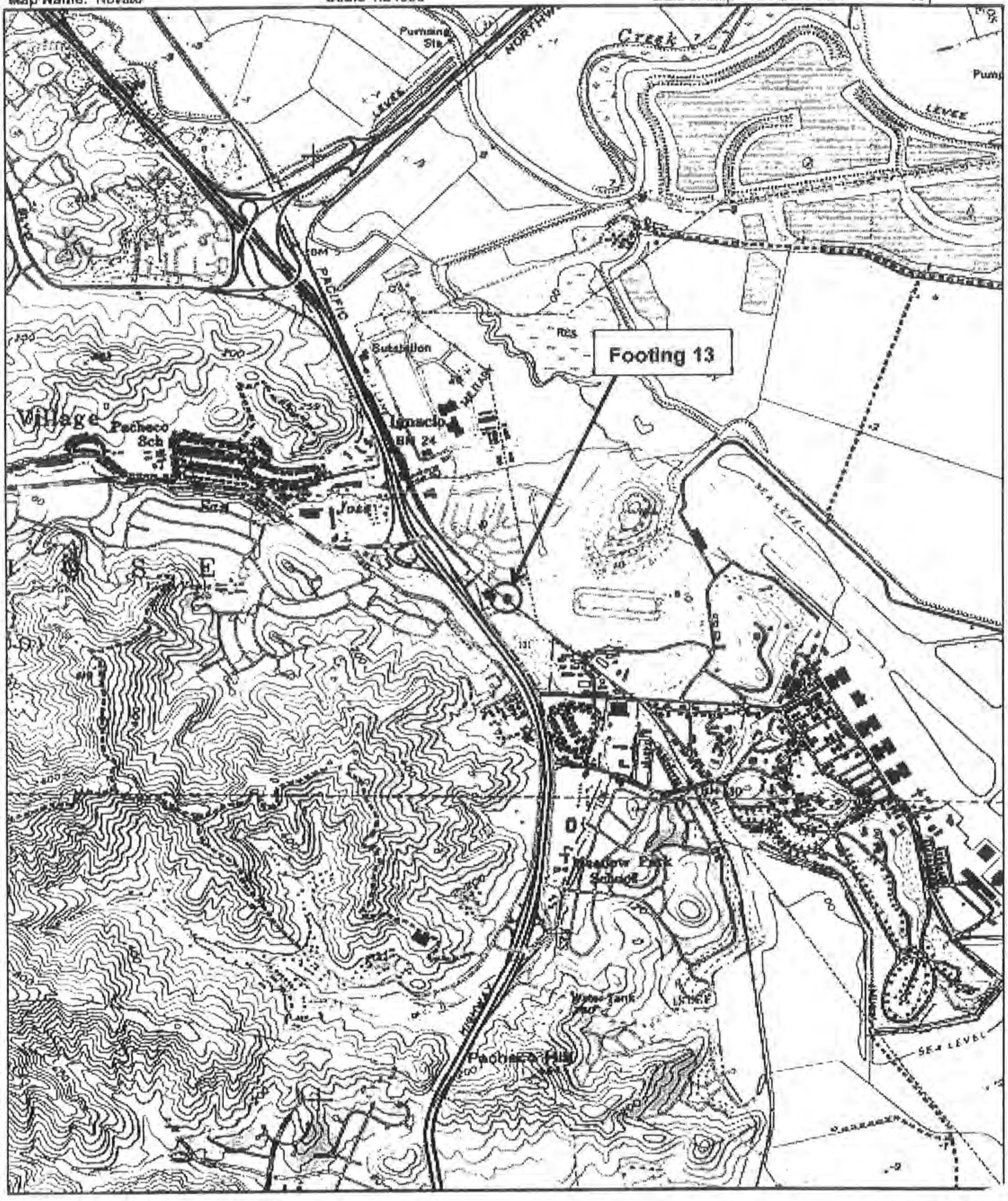
*Resource Name or #: Footing 13

*Map Name: Novato

*Scale 1:24000

*Date of Map: 1954, PR 1980

N↑



b

*Required Information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002618
HRI #
Trinomial CA-MRN-699H
NRHP Status Code

Other Listings
Review Code ______ Reviewer ________________ Date

*Resource Identifier (Assigned by recorder): Footing 14

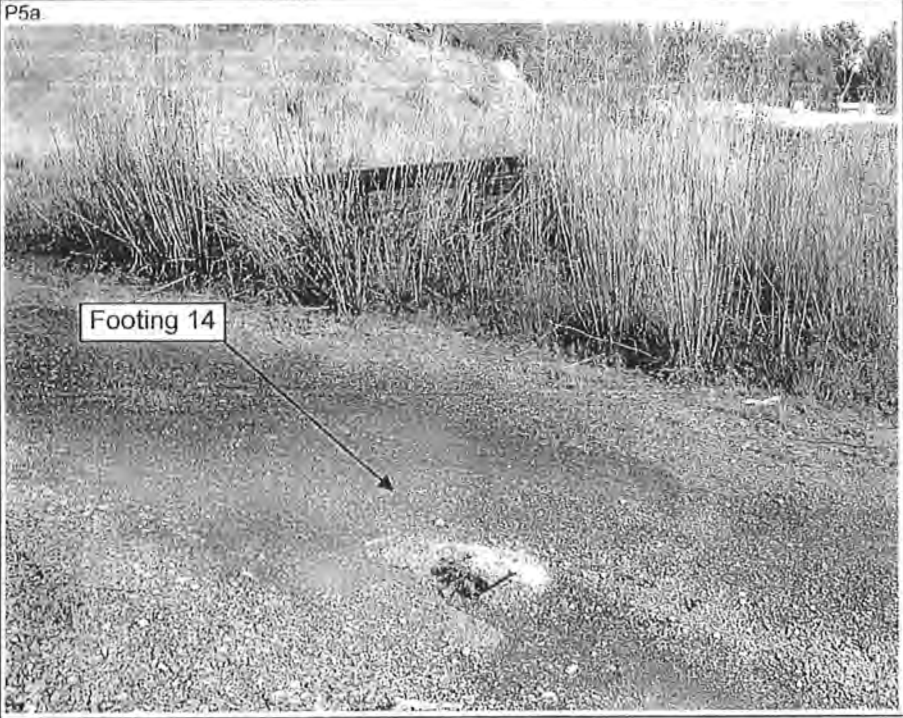
P1. **Other Identifier:**

*P2. **Location:** ☒Not for Publication ☐Unrestricted ☐a. **County:** Marin
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Novato **Date:** 1954 pr 1980 **T2N; R6W ;1/4 of 1/4 of 1/4 of Sec. ; B.M. No section** (San Jose Pacheco Rancho)
c. **Address** **City** **Zip**
d. **UTM: Zone 10, 540774mE/4213084mN**

e. **Other Locational Data:** From Hwy 101 north, take the Bel Marin Keys exit. Take an immediate right on Bel Marin Keys and another right on Nave. Turn left on Roblar. From the intersection of Roblar and the railroad tracks, follow the tracks north approximately 200 feet.

*P3a. **Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):** Footing 14 is a deteriorated concrete footing set flush with the ground. Its size is unknown due to its deterioration. It appears that a wood or metal post or beam was set in it at one time, based on the shape in concrete. It is approximately 7 feet east of the track near the barricaded end of a railroad spur. This footing is associated with the railroad, but the function is unknown.

P5a



*P3b. **Resources Attributes: (list attributes and codes)** : AH2 Foundations/structure pads

*P4. **Resources Present:** ☐ Building ☐ Structure ☒ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

*P5b. **Description of Photo: Footing 13, view to NE, 1/28/04**

*P6. **Date Constructed/Age and Source:** ☐ Prehistoric ☒ Historic ☐ Both

*P7. **Owner and Address:**
Sonoma Marin Area Rail Transit
90 Digital Drive
Novato, California 94949

*P8. **Recorded by (Name, affiliation, and address):**
Daniel Hart
Garcia and Associates
1 Saunders Ave
San Anselmo, CA 94960

*P9. **Date Recorded: 4/03**

*P10. **Type of Survey: Describe:** intensive pedestrian

*P11. **Report Citation (Cite survey report and other sources, or enter "none."):**
Denardo, C., and D. Hart.
2004. *Archaeological Inventory for the Sonoma Marin Area Rail Transit (SMART) Project, Sonoma and Marin Counties, California.* Garcia and Associates, San Anselmo, California. Submitted to Parsons Brinckerhoff Quade & Douglas. Prepared for Sonoma Marin Area Rail Transit Authority.

*Attachments: ☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

a

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

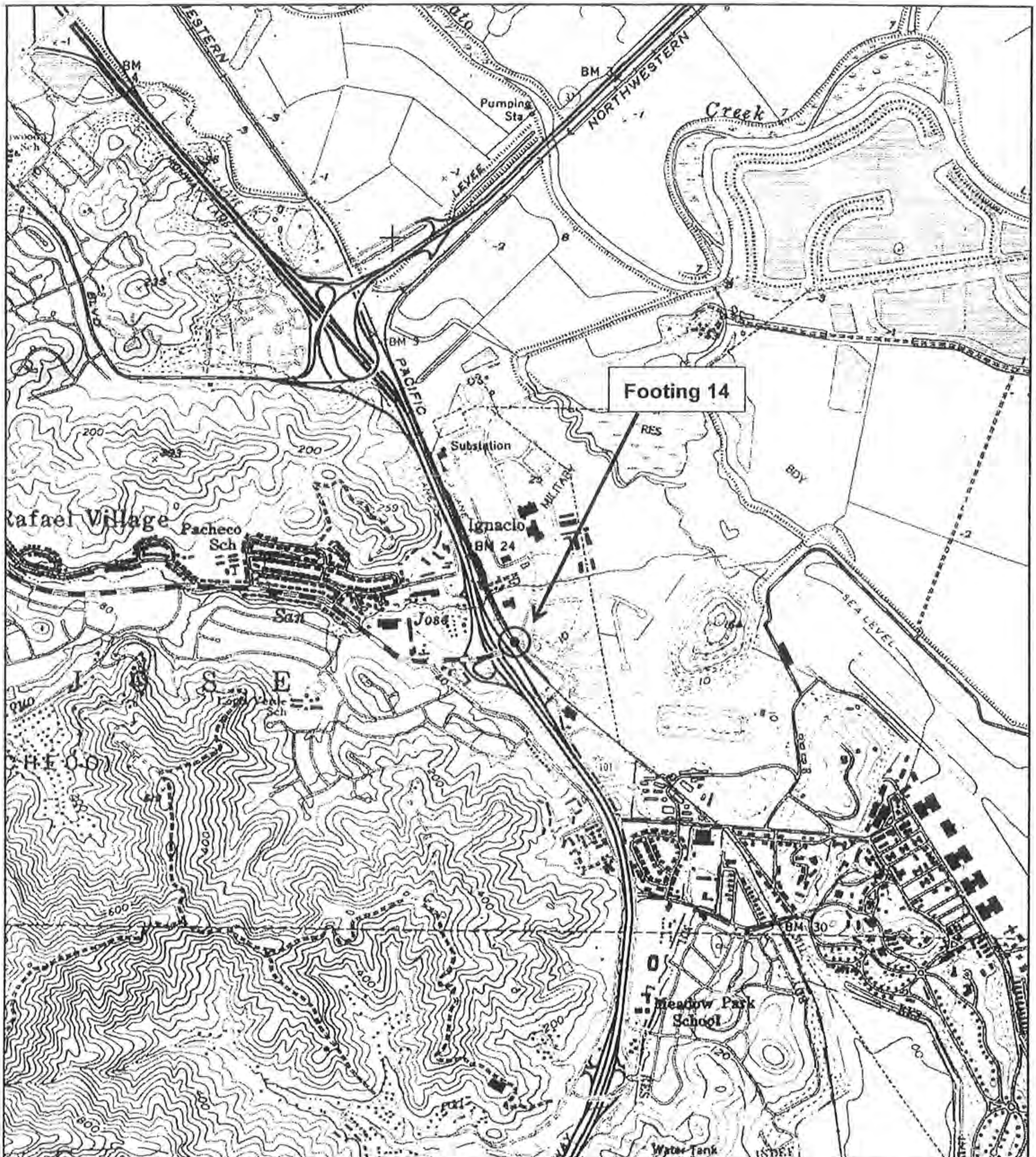
LOCATION MAP

Primary # P-21-002618
HRI #

Trinomial

*Resource Name or #: Footing 14

*Map Name: Novato *Scale 1:24000 *Date of Map: 1954, PR 1980 N↑



 *Required Information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002672
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

*__Resource Name or #:__ Las Gallinas Sanitary District Wastewater Treatment Plant

P1. Other Identifier:

***P2. Location:** ☒ **Not for Publication** ☐ **Unrestricted** ***a. County:** Marin County

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Novato **Date:** 1980 **T** ;**R** ; **¼ of** **¼ of Sec** **;** M.D. **B.M.**

c. Address: 300 Smith Ranch Road City: San Rafael, CA Zip: 94903

d. UTM: Zone: 10 ; 542416 mE/ 4208760 mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The LGVSD Wastewater Treatment Plant, located at 300 Smith Ranch Road in San Rafael, California, was constructed in 1955, and designed by J. Warren Nute, Engineer. The plant is a full, secondary treatment plant with a design capacity of 2.9 million gallons per day of dry weather flow, and includes approximately 115 acres of the main plant complex, and approximately 270 acres of irrigated pasture, 40 acres of storage ponds, a 20 acre freshwater wetland, a 10 acre salt marsh, and landscape irrigation. The LGVSD Wastewater Treatment Plant features an administration building, a shop building, a lab/visitor center building, and equipment buildings, along with various wastewater treatment facility equipment including clarifiers, digesters, biofilters, reactors, and ponds. Together these features make up a utilitarian group of facilities typical of secondary wastewater treatment plants. The district service area covering approximately 20 square miles, serves a community of approximately 32,000 people in northern San Rafael, predominantly residential, including discharges from some commercial and light industry sources (EOA, Inc. and LGVSD Staff 2009). A number of plant enlargements and upgrades have occurred at the plant since its original construction in 1954. Continued on page 4.

***P3b. Resource Attributes:** (List attributes and codes) HP 9 (Public Utility Building), HP8 (Industrial Building), PP11 (Engineering Structure).

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.

P5b. Description of Photo: (View, date, accession #) View of Clarifier # 1 and #2 with Sludge Scum Pit between, and Biofilers in the background, August 7, 2009.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
Las Gallinas Valley Sanitary District
300 Smith Ranch Road
San Rafael, CA 94903

***P8. Recorded by:** (Name, affiliation, and address)
Jennifer Lang, MS
Garcia and Associates (GANDA)
1 Saunders Avenue
San Anselmo, CA 94960

***P9. Date Recorded:** August 7, 2009

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") *Cultural Resources Inventory and Evaluation of the Las Gallinas Valley Samitary District Wastewater Treatment Plant, San Rafael, Marin County, California*. Prepared for the Las Gallinas Valley Sanitary District. Prepared by Garcia and Associates (GANDA), September 2009.

***Attachments:** ☐NONE ☒Location Map ☒☐Sketch 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):

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code**

***Resource Name or #** (Assigned by recorder) Las Gallinas Sanitary District Wastewater Treatment Plant

B1.Historic Name: Las Gallinas Sanitary District Wastewater Treatment Plant
B2. Common Name:
B3. Original Use: Wastewater Treatment Facility B4. Present Use: Wastewater Treatment Facility
***B5. Architectural Style:**
***B6. Construction History:** (Construction date, alterations, and date of alterations)
Constructed in 1955 with a number of plant enlargements and upgrades in 1958, 1964, 1975, 1982, and 2005.
***B7. Moved?** ☒**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: Warren J. Nute, Engineer b. Builder:
***B10. Significance: Theme:** N/A **Area:**
Period of Significance: N/A **Property Type:** N/A **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The LGVSD Wastewater Treatment Plant, constructed in 1955, and substantially updated, altered, and modernized in 1958, 1964, 1975, 1982, and 2005, represents a locale resource that provides wastewater treatment for a portion of the City of San Rafael. The LGVSD Wastewater Treatment Plant does not appear to be eligible for listing in the NRHP under Criterion A (events) or the CRHR under Criterion 1 (events). The plant is a utilitarian plant that performs a standard sanitary function, and as such, it is not associated with any unique or special engineering features related to industrial design.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under NRHP Criterion B, or the CRHR under Criterion 2. Criteria B and 2 address a property's significance for its association with the lives of persons in the past. The LGVSD Wastewater Treatment Plant is not associated with the lives of persons in the past.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under NRHP Criterion C (architecture/engineering/workmanship), or the CRHR under Criterion 3 (architecture/engineering/workmanship). The treatment plant is a utilitarian facility that does not exhibit any special architecture, design or engineering; the utilitarian nature of the wastewater treatment plant limits any expression of aesthetics. Furthermore, the wastewater treatment plant was not designed or built by a master architect or engineer. The plant is highly utilitarian in nature, the overall arrangement of the system complex is not distinctive and the facilities are not housed in any unusual buildings. Its design and construction do not represent innovations in wastewater treatment technology, and it does not employ any significant engineering features. The wastewater treatment plant design and engineering are not outstanding or unique, and as such, the wastewater treatment plant is not significant under Criterion C or 3.

B11. Additional Resource Attributes: (List attributes and codes) HP9 (Public Utility Building), HP8 (Industrial Building), HP11 (Engineering Structure).

***B12. References:** See Continuation Sheet, page 10.

B13. Remarks:

***B14. Evaluator:** Jennifer Lang, M.S.
Garcia and Associates (GANDA)
1 Saunders Avenue
San Anselmo, CA 94960

***Date of Evaluation:** August 7, 2009

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

The LGVSD Wastewater Treatment Plant does not appear to be eligible under the NRHP Criterion D. The wastewater treatment plant has been well documented, and it does not appear to be a source of additional important information.

In summary, the LGVSD Wastewater Treatment Plant does not appear to be eligible for listing in the NRHP under Criteria A ,B, C, or D, or in the CRHR under Criteria 1, 2, 3, or 4, at the local, state or national level.

For a property to be eligible for listing on the NRHP and the CRHR, it must retain sufficient integrity. The seven elements of integrity include location, design, setting, materials, workmanship, feeling and association. However, a resource must meet one or more of the NRHP and CRHR criteria before a determination can be made about its integrity. As such, the LGVSD Wastewater Treatment Plant is not associated with important events or persons in California history, nor does it possess distinctive engineering or technology. The LGVSD Wastewater Treatment Plant is not eligible for inclusion in the NRHP or the CRHR.

Filter structure.

Continued from page 1.

The LGVSD Wastewater features an administration building, a shop building, a garage structure, a lab/visitor center building, and equipment buildings, along with various wastewater treatment facility equipment, including clarifiers, digesters, biofilters, reactors, and ponds. Together these structures make up a utilitarian group of facilities typical of secondary wastewater treatment plants.

When it was completed in 1955, the LGVSD Wastewater Treatment Plant included an access road, a parking area, and sewage treatment works, including a sludge dispenser, a recirculation pump pit, and a biofiler. A number of plant enlargements and upgrades have occurred at the plant since its original construction in 1954. In 1958, the following features/works were added to the plant facility: a primary and secondary clarifier, an administration building, a chlorination building, and a pump station. In 1964, the following additional features/works were added to the facility: an additional secondary clarifier, a biofilter, an additional sludge digester, a sludge equipment building (located between the digesters), a grit washer, and a sludge digester area. In 1975, the sledge gravity thickener and the chlorine contact chamber were constructed. In 1982, the effluent disposal project included the addition of a number of features for the adjacent reclamation area, including two storage ponds, a fresh water marsh, a salt water marsh, five pastures for irrigation, and supplemental pastures with irrigation pivots (all of these features are located outside the boundaries of the project area). In 1975, a chlorine contact basin was added to the facility. The 1982, treatment plant improvements included the following: the addition of a larger primary clarifier, a grit chambers and equipment building, filters (structure), a fixed film reactor, filtered water storage, shop building (adjacent to the administration building), the former grit separator was rehabilitated, the garage structures were added, and the administrative building received additions including a new exterior stucco coating. In 2005, the grit chambers head works was modified, the electrical building control room was constructed, and the lab/visitor center was completed. In addition, Pond 1 and Pond 2 were converted to equalization ponds for the Marin Municipal Water District's filter backwash.

The LGVSD Wastewater Treatment Plant represents a utilitarian secondary wastewater treatment facility comprised of various industrial and technological features typical of wastewater treatment plants from the 1950s-2009, such as sludge digesters, clarifyers, biofilters, and pump stations. Key components of the system have been updated and enlarged over time.

Most cities in the United States have experienced similar trends in the history of sewage treatment; settlement and growth are followed by a continuous need for more efficient and sanitary methods of waste disposal. From the late 1800s, sewage disposal advanced from individuals dumping their own wastes, to a sewer system discharging directly to local waterways, to construction of primary and secondary treatment plants (Rossi 1995). In the late 1880s, many large cities in the United States constructed simple sewage systems that channeled untreated wastewater from residential and industrial sites directly into local rivers, creeks, and other large bodies of water. As the economy and standard of living improved for Americans in the twentieth century, many acquired indoor plumbing, thereby generating more wastewater from showers, baths and toilets. In addition, technological advances increased the number of home appliances that used large quantities of water, such as washing machines and dishwashers. As wastewater from residents increased in volume and complexity, it became inconvenient for urban residents to rely on decentralized septic tanks for sewage disposal. The nation's waters suffered as a result of all of these combined intensified water uses.

In 1946, Congress passed the Water Pollution Control Act in response to the increasing volume of industrial and residential wastewater contaminating the nation's waters (Burian et al 2000). The law aimed to "restore and maintain the chemical, physical, and biological integrity of the Nation's water" (U.S. Environmental Protection Agency [online]). In 1949, California state legislators enacted the Dickey Water Pollution Act to curtail water pollution that created nuisance from odors or unsightliness. The Dickey Act also created the State Water Quality Control Board.

In 1954, the Las Gallinas Valley Sanitary District was formed by San Rafael residents who were faced with serious health problems from failing septic tanks and pollution in Gallinas Creek. The original LGVSD Wastewater Treatment Plant, a secondary treatment facility, was constructed in 1955, and a number of plant enlargements and upgrades have occurred since that time. The LGVSD Wastewater Treatment facility now serves approximately 30,000 residential, and some commercial and light industry customers in northern Marin County. The treatment facility has a design capacity of 2.9 million gallons per day (Woodward Clyde Consultants 1993).

Grit washer.

CONTINUATION SHEET

***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Recorded by:** Jennifer Lang, M.S. ***Date:** September 2009 ☒ Continuation ☐ Update

View of shop building and the administrative offices of the Las Gallinas Valley Sanitary District.

View of the administrative building at the Las Gallinas Valley Sanitary District.

CONTINUATION SHEET

***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Recorded by:** Jennifer Lang, M.S. ***Date:** September 2009 ☒ Continuation ☐ Update

Primary Digester.

Secondary Digester.

***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Recorded by:** Jennifer Lang, M.S. ***Date:** September 2009 ☒ Continuation ☐ Update

Clarifier #1 and #2 with Sludge Scum Pit in the center, and Primary and Secondary Biofilters in the background.

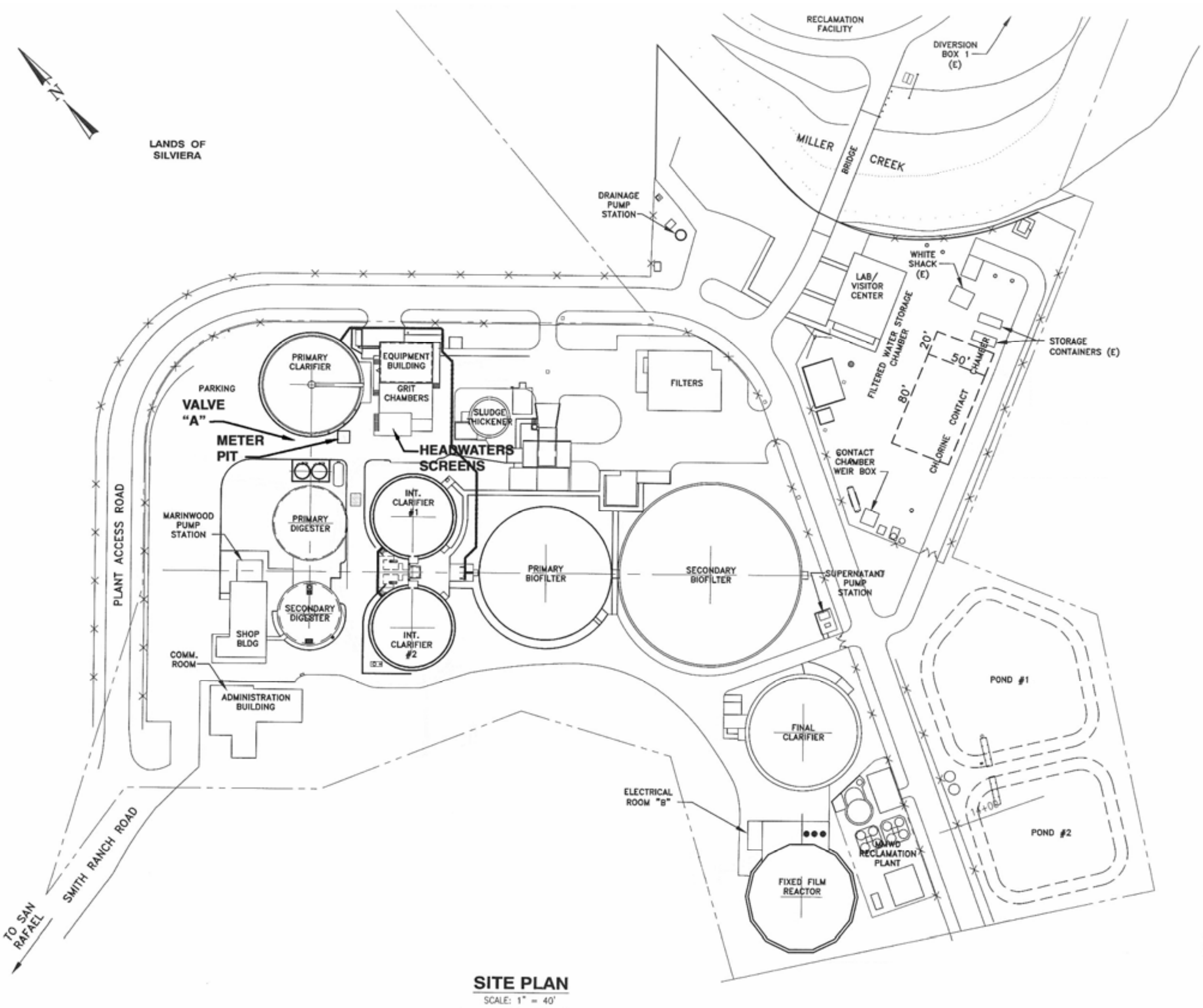
Sludge Scum Pit.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # P-21-002672
HRI#
Trinomial

Page 9 **of** 11 ***Resource Name or #** (Assigned by recorder) Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Drawn By:** Rad Smith, Garcia and Associates *__Date:__ September 2009



NOTE: Include bar scale and north arrow.

B12. References:

Burian, Stephen J., Stephan J. Nix, Robert E. Pitt, and S. Rocky Durrans.

2000 "Urban Wastewater Management in the United States: Past, Present, and Future," Journal *of Urban Technology*, 2000, *vol*. 7, no. 3.

EOA, Inc, and Las Gallinas Valley Sanitary District Staff
2009 Las Gallinas Valley Sanitary District Sewer System Management Plan. San Rafael, CA.

Rossi, Mary C.

1995 "The History of Sewage Treatment in the City of Buffalo, New York", in *Middle States Geographer*, 1995, 28:9-19.

United States Environmental Protection Agency (USEPA)

Accessed August 11, 2009. http://www.epa.gov/history/index.htm

United States Geological Survey (USGS)

1980 Novato, California, Quadrangle Map. U.S. Geological Survey, Washington, D.C.

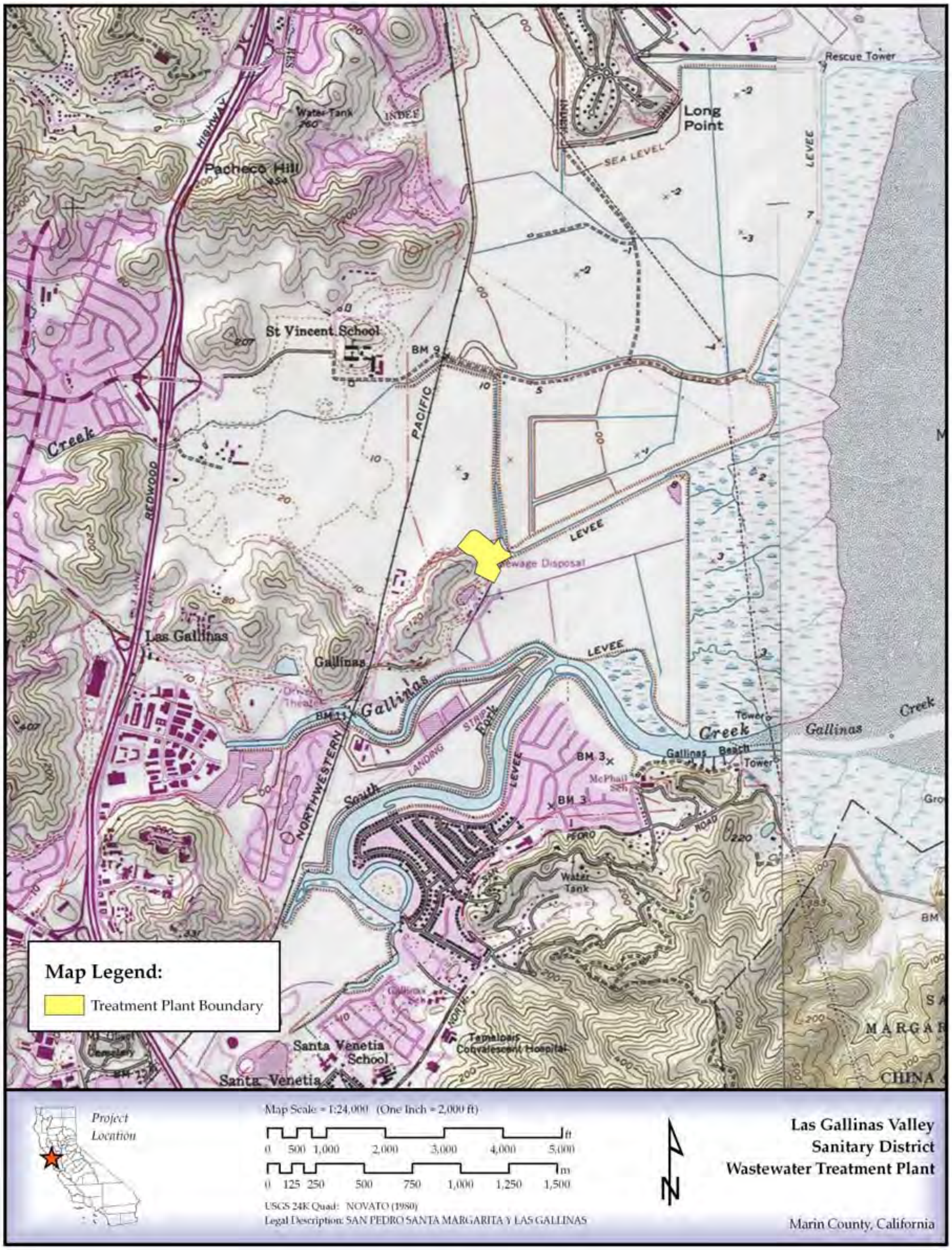
Woodward Clyde-Consultants

1993 *Wetlands as a Part of Reuse and Disposal: Las Gallinas Valley Sanitary District.* U.S. Environmental Protection Agency (Requisition No. A22190).

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION	Primary # **P-21-002672** HRI #
LOCATION MAP	Trinomial

Page 11 of 11 ***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Map Name** USGS 7.5' Quad Novato, CA ***Scale** 1:24000 *Date of Map: 1980



DPR 523J (1/95) ***Required Information**

Report Detail: S-005031

Identifiers

Report No.:	S-005031
Other IDs:	
Cross-refs:	

Citation information

Author(s):	David Chavez
Year:	1982 (Jul)
Title:	Proposed Pump Station and Interceptor Improvements for the Las Gallinas Valley Sanitary District Project, Marin County, California; SWRCB Project No. C-06-2469-020 (letter report)
Affiliation:	
No. pages:	5
No. maps:	1
Attributes:	Archaeological, Field study
Inventory size:	
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	No

Location information

County(ies):	Marin
USGS quad(s):	Novato
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	4/7/2005	nwic-main	
Last modified:	1/13/2016	mikulikc	
IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
	1/13/2016	simsa	database incomplete: Affiliation not submitted.
Record status:	Verified		

Report Detail: S-011503

Identifiers

Report No.: S-011503
Other IDs:
Cross-refs:

Citation information

Author(s): Vicki R. Beard
Year: 1990 (Mar)
Title: Historic Properties Preliminary Reconnaissance, Las Gallinas Flood Control Project, Marin County, California
Affiliation: Anthropological Studies Center, Cultural Resources Facility, Sonoma State University
No. pages: 11
No. maps: 3
Attributes: Archaeological, Architectural/historical, Field study
Inventory size: c 1 li mi
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Marin
USGS quad(s): Novato
Address:
PLSS:

Database record metadata

	Date	*User*	
Entered:	4/7/2005	nwic-main	
Last modified:	1/13/2016	simsa	
IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
Record status:	Verified		

Report Detail: S-011546

Identifiers

Report No.:	S-011546	
Other IDs:	*Type*	*Name*
	Submitter	Project ARS 88-21
Cross-refs:		

Citation information

Author(s):	Katherine Flynn
Year:	1988 (Mar)
Title:	Archaeological survey of Smith Ranch Hills Retirement Community Parcel, San Rafael (letter report)
Affiliation:	Archaeological Resource Service
No. pages:	15
No. maps:	3
Attributes:	Archaeological, Field study
Inventory size:	c 37 ac
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	No

Location information

County(ies):	Marin
USGS quad(s):	Novato
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	4/7/2005	nwic-main	
Last modified:	1/13/2016	simsa	
IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
Record status:	Verified		

Report Detail: S-012150

Identifiers

Report No.: S-012150
Other IDs:
Cross-refs:

Citation information

Author(s):
Year:
Title: Report of Archaeological Reconnaissance of Proposed North Bayfront Park,Marin County, California
Affliliation: Archaeological Consulting and Research Services, Inc.
No. pages: 5
No. maps: 1
Attributes: Archaeological, Field study
Inventory size: c 100 ac
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Marin
USGS quad(s): Novato
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	4/7/2005	nwic-main
Last modified:	1/13/2016	mikulikc

IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
	1/13/2016	simsa	database incomplete: Author and year not submitted; Updated GIS: changed eastern end of shape to fit parcels better

Record status: Verified

Report Detail: S-012946

Identifiers

Report No.: S-012946
Other IDs:
Cross-refs:

Citation information

Author(s): Miley Paul Holman
Year: 1976 (Feb)
Title: Cultural Resources Survey Report, Archaeology - Las Gallinas Valley Wastewater Reclamation Project
Affiliation: Holman & Associates
No. pages: 9
No. maps: 3
Attributes: Archaeological, Field study
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Marin
USGS quad(s): Novato, San Rafael
Address:
PLSS:

Database record metadata

	Date	*User*	
Entered:	4/7/2005	nwic-main	
Last modified:	1/13/2016	simsa	
IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
Record status:	Verified		

Report Detail: S-013217

Identifiers

Report No.: S-013217
Other IDs:
Cross-refs:

Citation information

Author(s): Thomas M. Origer
Year: 1990 (Nov)
Title: An Archaeological Survey for the AT&T Fiber Optics Cable, San Francisco to Point Arena, California
Affiliation:
No. pages: 9
No. maps: 8
Attributes: Archaeological, Architectural/historical, Field study
Inventory size: c 205 li mi
Disclosure: Not for publication
Collections: No

General notes

Associated resources

Primary No.	Trinomial	Name
P-21-000042	CA-MRN-000011	Nelson No. 11
P-21-000043	CA-MRN-000012	Nelson No. 12
P-21-000347	CA-MRN-000375	The Palo Marin Site
P-21-000527	CA-MRN-000600	Ancient Knoll
P-21-000528	CA-MRN-000601	Burdell Spring #1
P-21-002694		Golden Gate Bridge
P-38-001336		Golden Gate Bridge
P-49-002834	CA-SON-002322H	Northwestern Pacific Railroad

No. resources: 8
Has informals: No

Location information

County(ies): Marin, Mendocino, San Francisco, Sonoma
USGS quad(s): Annapolis, Asti, Big Foot Mtn, Cloverdale, Cotati, Geyserville, Gualala, Gube Mountain, Guerneville, Healdsburg, Jimtown, Mcguire Ridge, Novato, Petaluma, Petaluma River, Point Arena, Point Bonita, San Francisco North, San Geronimo, San Rafael, Santa Rosa, Sebastopol, Stewarts Point
Address:
PLSS:

Database record metadata

	Date	User
Entered:	4/7/2005	nwic-main
Last modified:	6/30/2015	mikulikc

IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
	12/19/201	neala	year added
	6/22/2015	mikulikc	database incomplete: no affiliation submitted
	6/24/2015	dollingers	Added several quads to location

Record status: Verified

Report Detail: S-016102

Identifiers

Report No.: S-016102

Other IDs:

Type	Name
Submitter	Project 92-21

Cross-refs:

Citation information

Author(s): William Roop

Year: 1992 (Jun)

Title: A Cultural Resources Evaluation of the St. Vincent's and Silveira Properties, San Rafael, Marin County, California

Affiliation: Archaeological Resource Service

No. pages: 30

No. maps: 6

Attributes: Archaeological, Field study

Inventory size: c 570 ac

Disclosure: Not for publication

Collections: No

General notes

The historic St. Vincent's School, Miller Station, and the Silveira Ranch; and two unrecorded prehistoric shell midden sites were identified within the project area.

Associated resources

Primary No.	Trinomial	Name
P-21-000157	CA-MRN-000132	NELSON NO. 132
P-21-000158	CA-MRN-000133	NELSON NO. 133
P-21-000159	CA-MRN-000134	NELSON NO. 134
P-21-000160	CA-MRN-000135	NELSON NO. 135
P-21-000161	CA-MRN-000136	NELSON NO. 136
P-21-000162	CA-MRN-000137	NELSON NO. 137
P-21-000173	CA-MRN-000148	Nelson No. 148

No. resources: 7

Has informals: Yes

Location information

County(ies): Marin

USGS quad(s): Novato

Address:

PLSS:

Database record metadata

	Date	User
Entered:	4/7/2005	nwic-main
Last modified:	1/13/2016	mikulikc

IC actions:

Date	User	Action taken
4/7/2005	jay	Appended records from NWICmain bibliographic database.

Record status: Verified

Report Detail: S-023403

Identifiers

Report No.:	S-023403	
Other IDs:	*Type*	*Name*
	Submitter	A.R.S. Project 00-02
Cross-refs:	See also S-026331	

Citation information

Author(s):	Eric Strother and Katherine Flynn
Year:	2000 (Apr)
Title:	A Cultural Resources Evaluation of the Smith Ranch Road Parcels "F" and "G", San Rafael, Marin County, California
Affliliation:	Archaeological Resource Service
No. pages:	11
No. maps:	3
Attributes:	Archaeological, Field study
Inventory size:	c 2 ac
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	No

Location information

County(ies):	Marin			
USGS quad(s):	Novato			
Address:	*Address*	*City*	*Assessor's parcel no.*	*Zip code*
			155-37-007	
			155-37-008	
PLSS:				

Database record metadata

	Date	*User*	
Entered:	4/7/2005	nwic-main	
Last modified:	1/15/2016	mikulikc	
IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
	1/14/2016	simsa	Updated GIS shape to fit parcel boundary better.
Record status:	Verified		

Report Detail: S-026331

Identifiers

Report No.:	S-026331	
Other IDs:	*Type*	*Name*
	Submitter	ARS 02-077 (formerly ARS 00-22)
Cross-refs:	See also S-023403	

Citation information

Author(s): Katherine Flynn

Year: 1976 (Mar)

Title: Evaluation of Proposed McGinnis Park Apartments II (A Resubdivision of Smith Ranch Homes Parcels "F" and "G"), San Rafael, Marin County (Letter Report)

Affliliation: Archaeological Resource Service

No. pages: 3

No. maps: 1

Attributes: Archaeological, Other research

Inventory size: c 2 ac

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Marin

USGS quad(s): Novato

Address:

PLSS:

Database record metadata

	Date	*User*	
Entered:	4/7/2005	nwic-main	
Last modified:	1/15/2016	mikulikc	
IC actions:	*Date*	*User*	*Action taken*
	4/7/2005	jay	Appended records from NWICmain bibliographic database.
Record status:	Verified		

Report Detail: S-029737

Identifiers

Report No.:	S-029737	
Other IDs:	*Type*	*Name*
	Submitter	A.R.S. Project 05-016
Cross-refs:		

Citation information

Author(s): Richard Greene
Year: 2005 (Feb)
Title: A Cultural Resources Evaluation of the San Rafael Airport Property, Marin County, California.
Affliliation: Archaeological Resource Service
No. pages: 17
No. maps: 1
Attributes: Archaeological, Field study
Inventory size: c 20 ac
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Marin
USGS quad(s): Novato

Address:	*Address*	*City*	*Assessor's parcel no.*	*Zip code*
			155-230-011	
			155-230-012	

PLSS:

Database record metadata

	Date	*User*
Entered:	4/21/2005	leigh
Last modified:	1/14/2016	simsa

IC actions:
Record status: Verified

Report Detail: S-031737

Identifiers

Report No.:	S-031737	
Other IDs:	*Type*	*Name*
	Voided	S-31738
Cross-refs:	See also S-031738	

Citation information

Author(s):	Carole Denardo and Daniel Hart
Year:	2004 (Oct)
Title:	Archaeological Resources Technical Report for the Sonoma Marin Rail Transit (SMART) Project, Sonoma and Marin Counties, California
Affliliation:	Garcia and Associates
No. pages:	993
No. maps:	
Attributes:	Archaeological, Field study
Inventory size:	c 70 li mi
Disclosure:	Not for publication
Collections:	No

Sub-desig.:	a
Author(s):	
Year:	2004 (Oct)
Title:	Historic Architectural Resources Technical Report for the Sonoma Marin Area Rail Transit (SMART) Project
Affiliation:	Garcia and Associates
Report type(s):	Architectural/historical, Evaluation, Field study
Inventory size:	
No. pages:	
Disclosure:	Not for publication
Collections:	Unknown
PDF Pages:	387-993

General notes

Some survey locations (stations, bus pads, and maintenance facility areas) were not mapped in GIS due to lack of maps in the report for those areas.

Associated resources

Primary No.	*Trinomial*	*Name*
P-21-000113	CA-MRN-000084	Nelson No. 84
P-21-000114	CA-MRN-000085	Nelson No. 85
P-21-000193	CA-MRN-000168	Nelson No. 168
P-21-000194	CA-MRN-000169	Nelson No. 169
P-21-000551	CA-MRN-000502	King's map reference, Mrn-372
P-21-000560	CA-MRN-000522	ARS-81-30-1
P-21-000675	CA-MRN-000644	Mission Avenue Midden
P-21-000681		Possible Chert Quarry
P-21-000685		ARS 99-91-01
P-21-002540		ARS 01-067-01; Pini Feed Mill c
P-21-002571	CA-MRN-000669	SMART 2
P-21-002611		Dock 1
P-21-002612		939 Tamalpais Avenue
P-49-000788	CA-SON-000847	PETALUMA #4
P-49-000790	CA-SON-000849	PETALUMA #6
P-49-000900	CA-SON-000963	THE MCGRATH SITE
P-49-000901	CA-SON-000964	The McGrath Site
P-49-000902	CA-SON-000965/H	The McGrath Site
P-49-001014	CA-SON-001085	
P-49-001196	CA-SON-001274	Site 'A' (Headless midden)

Report Detail: S-031737

P-49-001198	CA-SON-001276H	Santa Rosa Brewery / Grace Bro
P-49-001262	CA-SON-001344	1-04-SON-101 PM 49.8
P-49-001263	CA-SON-001345	2-04-SON-101 PM 49.8
P-49-001352	CA-SON-001449	Grant Street site
P-49-001468	CA-SON-001585	Field Site 1
P-49-001517	CA-SON-001789	Joe Torvick Site
P-49-001583	CA-SON-002152	
P-49-001798	CA-SON-002199	River Park Site
P-49-002134	CA-SON-001502	Braccialini Site
P-49-002255	CA-SON-001743H	
P-49-002273	CA-SON-001764H	trash scatter
P-49-002274	CA-SON-001765H	rock walls
P-49-002275	CA-SON-001766H	old house
P-49-002301	CA-SON-001802	Andresen Midden
P-49-002304	CA-SON-001805H	Redmond Site
P-49-002319	CA-SON-001820/H	Asti Cook House & Prehistoric Li
P-49-002536	CA-SON-002254/H	The Anderson Ranch
P-49-002539	CA-SON-002257H	CORONA-JSA-3
P-49-002695		PL-16H
P-49-002697		PL-18H
P-49-002819		Westbrooke 1
P-49-002820		ARS 00-100-01
P-49-002823		A. F. Stevens Mill & Lumber Co.
P-49-002824		
P-49-002825		
P-49-002826		
P-49-002827		
P-49-002833		
P-49-002834	CA-SON-002322H	Northwestern Pacific Railroad
P-49-003014		buried concrete wall
P-49-003022		2 West Third Street
P-49-003135		1090 Jennings Ave
P-49-003250		SMART 1
P-49-003334		Fishing Shack 1
P-49-003352		230 Corona Road
P-49-003353		360 Corona Road
P-49-003374		southeast corner of Corona Rd./
P-49-003376		SMART 3
P-49-003377		Winery Shack 1
P-49-003379		387-391 Corona Road
P-49-003380		1038 East Cotati

No. resources: 61

Has informals: No

Location information

County(ies): Marin, Sonoma

USGS quad(s): Asti, Cloverdale, Cotati, Geyserville, Healdsburg, Jimtown, Novato, Petaluma, Petaluma Point, Petaluma River, San Quentin, San Rafael, Santa Rosa, Sears Point

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	8/15/2006	jill
Last modified:	1/4/2016	castrom

IC actions:

Record status: Verified

Report Detail: S-036342

Identifiers

Report No.: S-036342

Other IDs:

Type	Name
Caltrans	EA 965100

Cross-refs:

Citation information

Author(s): Heidi Koenig
Year: 2009 (Jul)
Title: Historic Property Survey Report for the Marin Countywide Bicycle Parking Pilot Program, Marin County, California
Affliliation: Environmental Science Associates
No. pages: 121
No. maps:
Attributes: Archaeological, Architectural/historical, Field study
Inventory size: unknown
Disclosure: Not for publication
Collections: No

Sub-desig.: a
Author(s): Heidi Koenig
Year: 2009 (Jul)
Title: Archaeological Survey Report for the Marin Countywide Bicycle Parking Pilot Program, Marin County, California
Affiliation: Environmental Science Associates
Report type(s): Archaeological, Field study
Inventory size:
No. pages:
Disclosure: Not for publication
Collections: No
PDF Pages: 17-57

General notes

Associated resources

Primary No.	Trinomial	Name
P-21-000105	CA-MRN-000075	NELSON NO.75
P-21-000212	CA-MRN-000187	NELSON NO. 187
P-21-000319	CA-MRN-000342	The Novato Dam Site
P-21-000461	CA-MRN-000528	Stafford Lake #2
P-21-000542	CA-MRN-000321	Nelson No. 186
P-21-000565	CA-MRN-000312	Nelson 75a

No. resources: 6
Has informals: No

Location information

County(ies): Marin
USGS quad(s): Bolinas, Novato, San Quentin, San Rafael
Address:
PLSS:

Database record metadata

	Date	User
Entered:	1/15/2010	hagell
Last modified:	1/15/2016	mikulikc

IC actions:

Date	User	Action taken
1/14/2016	simsa	Added additional citation 'a'

Record status: Verified

Report Detail: S-036371

Identifiers

Report No.: S-036371
Other IDs:
Cross-refs:

Citation information

Author(s): Jennifer Lang and Cassidy DeBaker
Year: 2009 (Sep)
Title: Cultural Resources Inventory and Evaluation of the Las Gallinas Valley Sanitary District Wastewater Treatment Plan, San Rafael, Marin County, California
Affliliation: Garcia and Associates
No. pages: 49
No. maps:
Attributes: Archaeological, Field study, Literature search
Inventory size: c. .44 ac
Disclosure: Not for publication
Collections: No

General notes

Associated resources

Primary No.	Trinomial	Name
P-21-002672		Las Gallinas Sanitary District W

No. resources: 1
Has informals: No

Location information

County(ies): Marin
USGS quad(s): Novato
Address:
PLSS:

Database record metadata

	Date	User
Entered:	1/15/2010	hagell
Last modified:	1/14/2016	simsa

IC actions:

Date	User	Action taken
3/3/2011	jordanl	database info had been switched with S-36271, corrected on this date / GIS attributes OK

Record status: Verified

Report Detail: S-039171

Identifiers

Report No.: S-039171
Other IDs:
Cross-refs:

Citation information

Author(s): Heidi Koenig and Brad Brewster
Year: 2011 (Jan)
Title: North Bay Water Reuse Authority, North Bay Water Recycling Program; Marin, Sonoma, and Napa Counties: Cultural Resources Survey Report
Afflliation: ESA-Cultural Resources Group
No. pages: 598
No. maps:
Attributes: Archaeological, Architectural/historical, Evaluation, Field study
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-21-000026	CA-MRN-000359	N.C. Nelson, MRN-171
P-21-000174	CA-MRN-000149	Nelson No. 149
P-21-000201	CA-MRN-000176	Nelson No. 176
P-21-000216	CA-MRN-000191	Nelson No. 191
P-21-002618	CA-MRN-000699H	Northwestern Pacific Railroad
P-28-000622	CA-NAP-000747	AC-95
P-28-001553		Bridge at Pole 10/3
P-28-001554		Bridge at Pole 11/1
P-28-001662		Hagen Road Culvert
P-28-001663		Loma Heights Road Bridge
P-49-000196	CA-SON-000224	Nelson No. 224
P-49-000197	CA-SON-000225	Nelson No. 225
P-49-000198	CA-SON-000226	Nelson No. 226

No. resources: 13
Has informals: Yes

Location information

County(ies): Marin, Napa, Sonoma
USGS quad(s): Cuttings Wharf, Mt George, Napa, Novato, Sears Point, Sonoma
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	8/8/2012	baileyl
Last modified:	7/22/2015	rinerg

IC actions:
Record status: Verified

APPENDIX B

Lang and DeBaker 2009 Las Gallinas Valley SDWTP Evaluation Report

S-36371

Cultural Resources Inventory and Evaluation of the Las Gallinas Valley Sanitary District Wastewater Treatment Plant San Rafael, Marin County, California

Prepared For:

Susan McGuire
Las Gallinas Valley Sanitary District
300 Smith Ranch Road
San Rafael, CA 94903
415-472-1734

Prepared By:

GANDA

Jennifer Lang and Cassidy DeBaker
Garcia and Associates
1 Saunders Avenue
San Anselmo, CA 94960
415.458.5803

STATEMENT OF CONFIDENTIALITY

This report identifies the locations of cultural resources, which are confidential. As nonrenewable resources, archaeological sites can be significantly impacted by disturbances that can affect their cultural, scientific, and artistic values. Disclosure of this information to the public may be in violation of both federal and state laws. To discourage damage resulting from vandalism and artifact looting, cultural resources locations should be kept confidential and report distribution restricted. Applicable U.S. laws include, but are not be limited to, Section 304 of the National Historic Preservation Act (16 USC 470w-3) and California state laws that apply include, but are not be limited to, Government Code Sections 6250 *et seq*. and 6254 *et seq*.

MANAGEMENT SUMMARY

The Las Gallinas Valley Sanitary District (LGVSD) proposes to make improvements to a Wastewater Treatment Plant in San Rafael, Marin County, California. The treatment plant, originally built in 1955, has experienced a number of enlargements and upgrades, and is in current need of improvements. The Area of Potential Effects (APE) encompasses 0.44 acres within the LGVSD Wastewater Treatment Plant, and includes the rehabilitation of the immediate clarifiers. This cultural resources investigation has been conducted to identify cultural resources within the APE in accordance with Section 106 and 36 CFR 800 of the National Historic Preservation Act (NHPA). This investigation also complies with the California Environmental Quality Act (CEQA; Title 14 CCR 15064.5). The State Water Resources Control Board is the federal lead agency under Section 106. The following steps have been taken to identify potential historic properties within the APE as per 36 CFR 800.4. The purpose of this investigation is to identify and record cultural resources within the APE.

Findings for this report are based on the following:

- Records search and historic map research at the Northwest Information Center of the California Historic Resource Inventory System at California State University, Rohnert Park, California;

- Consultation with the Native American Heritage Commission and Native American groups and individuals;

- Review of existing documentation as it pertains to the APE;

- Review of published physiographic characterizations of the APE and surrounding area; and

- A historic architectural survey of the APE.

The records search indicated that no historic or prehistoric resources have been documented within the APE and no cultural resources have been identified within the 0.25 mile radius of the APE. Native American consultation yielded no specific information regarding prehistoric or ethnographic use of the project location (Appendix A).

Based on background research, review of geomorphologic maps, and the proposed depth of excavation into previously disturbed soil, the APE does not have the potential to contain buried prehistoric living surfaces, and therefore, no archaeological pedestrian survey was conducted. In addition, there is no visible ground surface within the APE. No archaeological resources have been identified within the APE for the proposed project.

A historic architectural survey was conducted on August 7, 2009. The historic architectural resource with the APE, the LGVSD Wastewater Treatment Plant, is not eligible for inclusion in the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR) (Appendix B).

CONTENTS

FIGURES

1.0 INTRODUCTION

The Las Gallinas Valley Sanitary District (LGVSD) proposes to make improvements to a Wastewater Treatment Plant in San Rafael, Marin County, California (Figures 1 and 2). In 1955, the LGVSD constructed the wastewater treatment plant in the Las Gallinas Valley in northeast San Rafael, near Novato, to address health problems from failing septic tanks in Santa Venetia, and new developments in San Rafael Meadows, Marinwood, Lucas Valley, and other communities. The treatment plant has experienced a number of enlargements and upgrades, and is in current need of improvements. The Area of Potential Effects (APE) encompasses 0.44 acres within the LGVSD Wastewater Treatment Plant, and includes the rehabilitation of the immediate clarifiers (Figure 3). This cultural resources investigation has been conducted to identify cultural resources within the APE in accordance with Section 106 and 36 CFR 800 of the National Historic Preservation Act (NHPA) The State Water Resources Control Board is the federal lead agency under Section 106. This investigation also complies with the California Environmental Quality Act (CEQA; Title 14 CCR 15064.5). The following steps have been taken to identify potential historic properties within the APE as per 36 CFR 800.4:

a) Determine the scope of identification efforts [36 CFR §800.4(a)];

b) Consultation with the Native American Heritage Commission (NAHC) and the Federated Indians of the Graton Rancheria;

c) Identify potential historic properties (which includes conducting cultural resources surveys) [36 CFR §800.4(b)], and

d) Report the results of the identification and inventory efforts [36 CFR §800.4(d)].

The purpose of this investigation is to identify cultural resources within the APE. In order to comply with Section 106 and 36 CFR 800, cultural resources specialists conducted background and archival research at the Northwest Information Center (NWIC) at Sonoma State University in Rohnert Park, California, mailed letters of consultation to the NAHC (Appendix A), conducted a historic architecture survey to identify architectural resources within the APE, and prepared this inventory report. No archaeological pedestrian survey was conducted within the APE (reader is referred to Sections 1 and 6 of this report for a more detailed explanation).

This report documents the methods used to identify cultural resources within the APE that are eligible, or potentially eligible, for listing in the National Register of Historic Places (NRHP). This report provides an illustration and description of the APE; regulatory, environmental, geomorphologic, prehistoric, ethnographic, and historic contexts; investigation methods; the results of consultation with Native American tribes; conclusions of the investigation; and recommendations for the unanticipated discovery of cultural resources within the APE.

PROJECT LOCATION AND DESCRIPTION

Project Location

The project area is located in the City of San Rafael in Marin County, California at 300 Smith Ranch Road. The APE is northwest of San Pedro Point, south of Hamilton Field, east of Highway 101, and west of San Pablo Bay. Within a quarter-mile of the APE are the tracks of Northwestern Pacific Railroad to the west, and the South Fork of Gallinas Creek to the south. Miller Creek, marsh lands, and a levee system, constructed along San Pablo Bay during the 1930s by the Army Corps of Engineers, lie to the north and east. A former Nike Battery Launcher site (now used by the Marin Municipal Water District for reclamation water tank storage), is located directly southwest of the APE.

Project Description

The LGVSD Improvement Project has been identified as Phase II of the Wastewater Treatment Plant Capital Improvement Program, dated November 18, 2008, and includes the rehabilitation of the intermediate clarifiers:

- **Rehabilitation of the Primary Clarifiers #2 and #3 and Upgrade of the Existing Sludge Pump Pit** –In order to rehabilitate these clarifiers it will be necessary to install a larger pipe between the headworks and the splitter box between the two clarifiers. The splitter box will need to be enlarged and will be equipped with modulating butterfly valves. The larger influent pipe will pass directly under the existing sludge pumping pit between the two clarifiers and the existing pumps and piping will be removed and replaced.

- **Replacement of Mechanisms and Baffles in Primary Clarifiers #2 and #3** – In order to rehabilitate these clarifiers the existing clarifier mechanisms will need to be replaced with new equipment. New wall baffles and tangential inlets will be installed to allow chemicals to be added as necessary to optimize the clarifier performance during high flow events.

It is important to note that portions of the original site of the LGVSD Wastewater Treatment Plant were likely dynamited in order to facilitate the construction of the plant in 1955. An approximate depth of 20-30 feet of rock was removed from the facility grounds and includes the present day APE (Appendix C). Based on review of the original treatment plant blueprint prepared by Harry N. Jenks Consulting (1955), the topography of the APE was steep and hilly and has since been leveled out to accommodate the existing facility (i.e. immediate clarifiers) (see Appendix C).

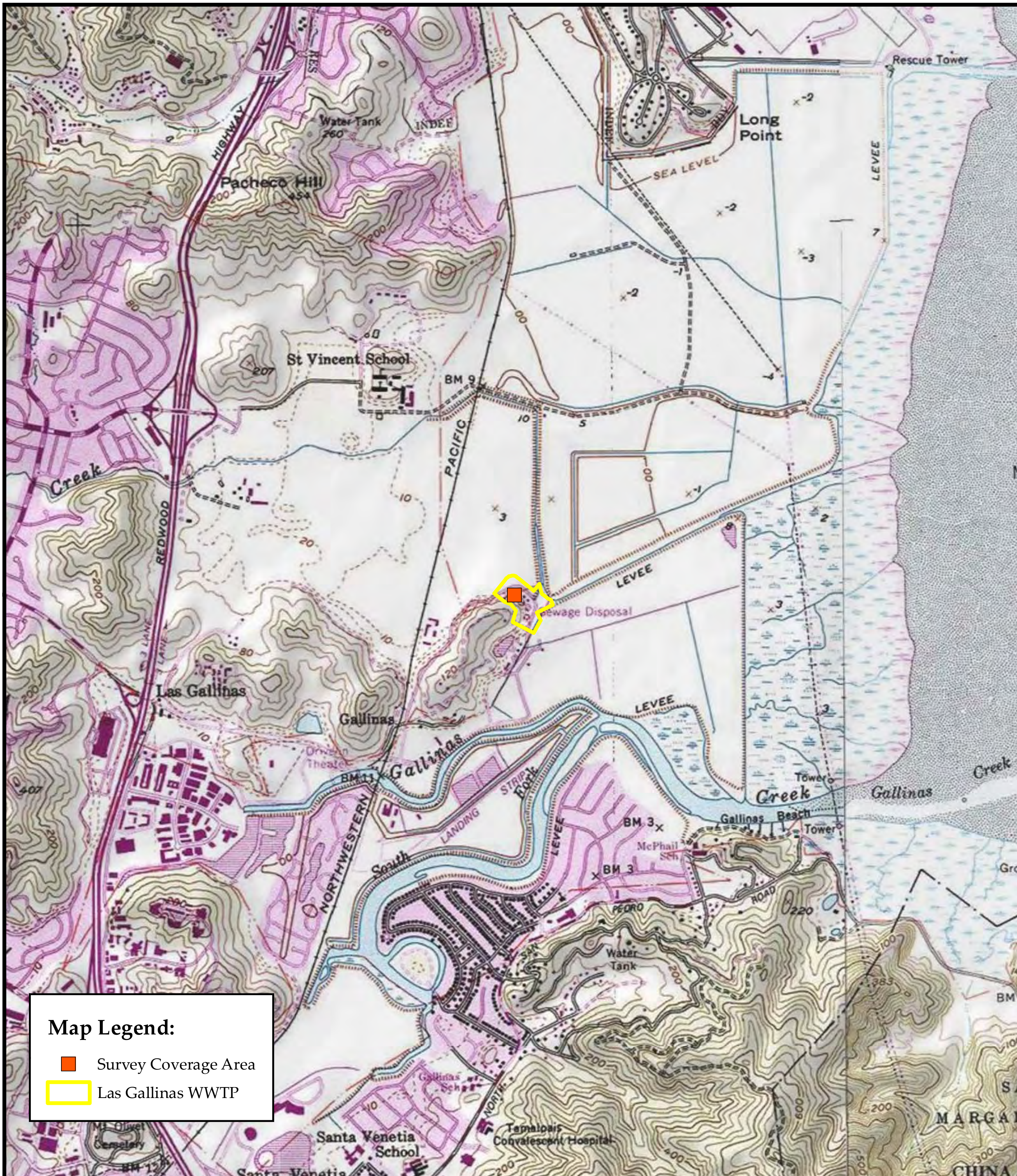
DESCRIPTION OF THE AREA OF POTENTIAL EFFECTS

The presently defined APE is the area where actual ground-disturbing activities will occur during project construction. The archaeological APE for the proposed project includes the footprint of the project, including the horizontal and vertical perimeters of construction, and impacts. The archaeological APE consists of two existing intermediate clarifiers (see Figure 3). The historic architectural APE includes the area within the archaeological APE, as well as the entire parcel for the LGVSD Wastewater Treatment Plant (and not including the adjacent reclamation area).

The vertical APE includes all disturbed ground within the footprint of the horizontal APE for the rehabilitation of the intermediate clarifiers, where excavation will extend below the existing ground surface. While these modifications will require upgrades and enlargements to the existing clarifiers, the footprint of related disturbance will not extend below previously disturbed soil.

Figure 1.
Las Gallinas Valley WWTP Improvements Project Vicinity Map

Marin County, California



Map Scale = 1:24,000 (One Inch = 2,000 ft)

0 500 1,000 2,000 3,000 4,000 5,000 ft

0 125 250 500 750 1,000 1,250 1,500 m

USGS 24K Quad: NOVATO (1980)
Legal Description: SAN PEDRO SANTA MARGARITA Y LAS GALLINAS

N

Figure 2.
Project Location and Survey Coverage Map

Marin County, California

Figure 3.
Las Gallinas Valley
WWTP Improvements
Area of Potential Effects

Marin County, California

3.0 REGULATORY CONTEXT

The regulatory framework that mandates consideration of cultural resources in project planning includes federal, state, and local governments. Cultural resources include prehistoric and historic archaeological sites, districts, and objects; standing historic structures, buildings, districts, and objects; and locations of important historic events or sites of traditional and/or cultural importance to various groups. Cultural resources may be determined significant or potentially significant in terms of national, state, or local criteria, either individually or in combination. Resource evaluation criteria are determined by the compliance requirements of a specific project.

FEDERAL REGULATIONS

Section 106 of the National Historic Preservation Act (NHPA)

Section 106 of the NHPA requires federal agencies and those they fund or have approval authority over to consider the effects of their actions on properties that may be eligible for listing or are listed in the NRHP. To determine whether an undertaking could affect NRHP eligible properties, cultural resources (including archaeological, historical, and architectural properties) must be inventoried and evaluated for listing in the NRHP. Although compliance with Section 106 is the responsibility of the lead federal agency, in this case the State Water Resources Control Board, others can undertake the work necessary to comply with Section 106. The Section 106 process entails six primary steps, listed below.

1. Initiate consultation and public involvement.
2. Identify and evaluate historic properties within the APE.
3. Assess effects of the project on historic properties.
4. If there are historic properties that will be affected, then consult with the State Historic Preservation Officer (SHPO) regarding adverse effects on historic properties, resulting in a memorandum of agreement (MOA), if appropriate.
5. Submit the MOA (by the agency official, in this case, USDA FS) to the Advisory Council on Historic Preservation (ACHP).
6. Proceed in accordance with the MOA, if appropriate.

National Register of Historic Places (NRHP) Criteria for Evaluation

An archaeological site's significance is determined using the NRHP's Criteria for Evaluation at 36 CFR 60.4, which state that a historic property is any district, site, building, structure, or object:

a) that is associated with events that made a significant contribution to the broad patterns of our history (Criterion A);

b) that is associated with the lives of persons significant to our past (Criterion B);

c) that embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C); and/or

d) that has yielded, or may be likely to yield, information important in prehistory or history (Criterion D).

Archaeologists generally evaluate archaeological resources using Criterion D in order to determine their potential to yield information. Criterion D emphasizes the importance of the information encompassed in an archaeological site rather than its inherent value as a surviving example of a particular architectural type or its historical association with an important person or event. If the SHPO determines that a cultural resource is eligible for inclusion to the NRHP, then it is automatically eligible for the CRHR. If a resource does not have the level of integrity necessitated by the NRHP, it may still be eligible for the CRHR, which allows for a lower level of integrity (see below).

STATE REGULATIONS

California Environment Quality Act (CEQA)

The CEQA Statute and Guidelines include procedures for identifying, analyzing, and disclosing potential adverse impacts to historical resources, which include all resources listed in or formally determined eligible for the NRHP, the CRHR, or local registers. CEQA further defines a "historical resource" as a resource that meets any of the following criteria:

- A resource listed in, or determined to be eligible for listing in, the National Register of Historic Places or California Register of Historical Resources.

- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code, unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

- A resource identified as significant (e.g., rated 1-5) in a historical resource survey meeting the requirements of Public Resource Code Section 5024.1(g) (Department of Parks and Recreation Form 523), unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

- 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 determination is supported by substantial evidence in light of the whole record. Generally, a resource is considered "historically significant" if it meets the criteria for listing on the California Register of Historical Resources (CEQA Guidelines Section 15064.5).

California Register of Historical Resources (CRHR) Criteria of Evaluation

The CRHR is a listing of State of California resources that are significant within the context of California's history, and includes all resources listed in or formally determined eligible for the NRHP. The CRHR is a state-wide program of similar scope to the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR. A historic resource must be significant at the local, state, or national level under one or more of the following criteria that are defined in the California Code of Regulations Title 14, Chapter 11.5, Section 4850:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or

2. It is associated with the lives of persons important to local, California, or national history; or

3. 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. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The CRHR criteria are similar to NRHP criteria, and are tied to CEQA, as any resource that meets the above criteria is considered an historical resource under CEQA.

Regulations Concerning Discovery of Human Remains

California Public Resources Code §5097.98 (Notification of Native American human remains, descendants; disposition of human remains and associated grave goods) mandates that the lead agency adhere to the following regulations when a project results in the identification or disturbance of Native American human remains:

a) Whenever the Native American Heritage Commission receives notification of a discovery of Native American human remains from a county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code, it shall immediately notify those persons it believes to be most likely descended from the deceased Native American. The descendents may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American remains and may recommend to the owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and any associated grave goods. The descendents shall complete their inspection and make their recommendation within 24 hours of their notification by the commission. The recommendation may include the scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

b) Whenever the Native American Heritage Commission is unable to identify a descendent, or the descendent identified fails to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the descendent and the mediation provided for in subdivision (k) of Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance.

c) Notwithstanding the provisions of Section 5097.9, the provisions of this section, including those actions taken by the landowner or his or her authorized representative to implement this section and any action taken to implement an agreement developed pursuant to subdivision (l) of Section 5097.94, shall be exempt from the requirements of the California Environmental Quality Act [Division 13 (commencing with Section 21000)].

d) Notwithstanding the provisions of Section 30244, the provisions of this section, including those actions taken by the landowner or his or her authorized representative to implement this section, and any action taken to implement an agreement developed pursuant to subdivision (1) of Section 5097.94 shall be exempt from the requirements of the California Coastal Act of 1976 [Division 20 (commencing with Section 30000)].

4.0 BACKGROUND

EXISTING ENVIRONMENT

Marin County is located in northern California, west of the San Francisco Bay. Geographically, Marin County encompasses a large south-facing peninsula, with the Pacific Ocean to the west, San Pablo Bay and San Francisco Bay to the east, the City of San Francisco to the south, and Sonoma County to the north. Marin County is within the Mediterranean-like climate zone of central California, which is characterized by warm, dry summers and cool, wet winters. Annual rainfall in the project area averages 20 to 30 inches and temperatures range from 85 °F in July to 41 °F in December and January.

The soil type for the project area is classified as the part of the Reyes series and consists of very deep and poorly drained soils. Typically, the Reyes soils are formed in alluvium deposited along the margin of bays with slopes of 0 to 2 percent (USDA 1985). The APE for the project area is roughly 500 feet west of Miller Creek and Richardson Bay, where buried archaeological resources are not likely, due to the presence of Bay Mud deposits, a potentially non-cultural layer (Holmon 2007). In addition, a historic blueprint of the LGVSD facility depicts the topography of the APE prior to the construction of the facility as steep and hilly in 1955 (see Appendix C). According to Mark Wilson from Nute engineering, approximately 20-30 feet of rock was removed from the present day APE in order to accommodate the construction of the treatment plant in 1955.

PREHISTORIC CONTEXT

Archaeological investigations seek to explain continuity and change in past human cultures. Archaeological interpretation of material remains can address many aspects of human behavior, including when people occupied an area and at what time of year; the technological and natural resources available; social organization; settlement patterns; relationships with neighboring groups in terms of trade, competition, and conflict, ceremonial systems; and external environmental issues faced by Native peoples. Current archaeological research seeks to explain a wide array of questions regarding prehistoric human culture and their adaptive responses.

Archaeologists now recognize three general patterns of cultural adaptation throughout the San Francisco Bay region based on artifact assemblages, mortuary practices, and patterns of cultural adaptation during the period between 5000 and 200 B.P. (Before Present). The three primary time periods are the Early Period (5000–2500 BP), the Middle Period (2500-1300 BP), and the Late Period (1300–200 BP or contact). The cultural framework presented below is a refined version of the Central California Taxonomic System (CCTS) (Beardsley 1954).

Early Period/Windmiller Pattern (5000 B.P.–2500 B.P.)

The Early Period is divided into the Early, Middle, and Late Windmiller, named for the Windmiller Pattern, the oldest archaeological complex, first identified in the Sacramento–San Joaquin Delta (Lillard et al. 1939). The Windmiller Pattern is thought to be composed of a mixed economy of game procurement and wild plant foods. The archaeological assemblages of this period contain numerous projectile points, including large obsidian concave base and stemmed points, rectangular *Olivella* beads, and a wide range of faunal remains (Erlandson and Jones eds. 2002).

Middle Period/Berkeley Pattern (2500 B.P.–1300 B.P.)

The Windmiller Pattern shifted to a more specialized adaptation called the Berkeley Pattern, which spanned the next 1200 years. Berkeley Pattern assemblages generally show a decrease in the presence of milling slabs and manos, and a shift to the mortar-and-pestle technology, indicating an increased dependence on acorns throughout the San Francisco Bay region. Although gathered resources gained importance during this period, the continued presence of projectile points and atlatls (spear-throwers) in the archaeological record indicates that hunting was still an important activity (Fredrickson 1973).

Late Period/Augustine Pattern (1300 B.P.–Contact)

The Augustine Pattern followed the Berkeley Pattern, beginning around 1300 years B.P.. This period is also divided into the Middle/Late Transition (1300–800 B.P.) and Late Period (800 B.P.–Contact). This pattern exhibits elaborate ceremonial and social organization, and the development of social stratification. Exchange became well developed, with increased intensive emphasis placed on the use of acorns, as evidenced by the presence in the archaeological record of shaped mortars and pestles, and numerous hopper mortars.

ETHNOGRAPHIC CONTEXT

Coast Miwok

The project area is within the Coast Miwok ethnographic territory. Coast Miwok once inhabited the region and they inhabited the coastal and inland areas of northern San Francisco, Richardson, San Pablo, Tomales and Bodega bays (Goerke 2007). Their territory extended as far inland as the Napa River. Coast Miwok villages are mostly near watercourses and not necessarily near the coast. Near San Anselmo, Miller and Gallinas creeks, several villages existed, including Shotomoko-cha, Ewa, and Awani-wi. The village of Awani-wi is at the site of the present-day Mission San Rafael (Milliken 1995).

Coast Miwok political organization revolved around village life. In larger villages, the chief held a non-hereditary position. The chief was responsible for taking care of villagers, advising them, and overseeing activities in the mixed dance house. The reigning chief and four elderly women tutored upcoming chiefs (Kelly 1978). Other leaders of the Coast Miwok included the woman chief or maien. The woman chief functioned primarily as a ceremonial leader, deeply involved in the Bird Cult that presided over the Acorn Dance and Sunwele Dance (Kelly 1978).

The social fabric of the Coast Miwok was characterized, in a large part, by dancing. Dances occurred frequently either for enjoyment, to restore the sick to health, or for special ceremonial events such as the Acorn and Sunwele dances. The Acorn Dance was associated with the first fruits of the season, and the Sunwele Dance was a religious ceremony.

Coast Miwok villages were composed of various structures including residential dwellings, sweathouses, and secret society dance houses. Residential dwellings were conical structures framed with willow or driftwood and thatched with bunches of grass, tule reeds, or rushes. Each house held from six to ten individuals and had a central stone hearth and a smoke hole in the roof. Sweathouses were round, semi-subterranean structures recessed into the earth 4-5 feet (Kelly 1978).

Subsistence was reliant on both plant and animal resources exploited along the coast and inland. Fishing and hunting were common as was gathering plants and marine resources. The Coast Miwok relied on a diet of animals such as salmon, eels, crab, mussels, clams, mudhens, geese, bears, elk, deer, rabbits, squirrels, woodrats, and gophers. Plant resources gathered by the Coast Miwok included buckeye, pepperwood, seeds, greens, acorns, tobacco, and kelp. Acorns, an important staple in their diet, were pulverized into mush and meal for bread.

HISTORIC CONTEXT

Contact Period (A.D. 1542 - 1769)

In 1542, Juan Sebastian Cabrillo was the first of the exploring Europeans to sail along the California coast. The goal of this expedition was to explore the new territory and to find worthy locations for establishing Franciscan missions; along the way, they rediscovered the Bay of Monterey, as described by sailors a hundred years earlier. Several accounts of this expedition exist, including those of Fray Juan Crespi (Bolton 1927), Miguel Costansó (Browning 1992), and Pedro Fages (Priestley 1937). Francis Drake set out from England in 1579 and landed along the northern California coast. The Coast Miwok Indians, who resided in the area from about 700 A.D., first encountered Europeans during this voyage, in addittion to subsequent expeditions by Spanish and Russian explorers (Stewart 1982; Marin History Museum website accessed on July 16, 2009).

Mission Period (A.D. 1769 – 1822)

The arrival of the Spanish, and the subsequent establishment of the missions, was the beginning of the end of tribal life. The destruction of native culture was caused by the alteration of the landscape due to the introduction of European plants and animals, the destruction of social systems by new mission lifeways, and the introduction of European diseases. The missions of the San Francisco Bay Area were established as follows: Mission Dolores in 1776, and Mission Santa Clara and Mission San Jose in 1777 and 1797, respectively. However, in Marin County, the Mission Period coincided with the founding of a Russian colony at Bodega Bay in 1809. In 1817, the Spanish founded Mission San Rafael Archangel as a retort to the Russian outpost. Mexican settlements and livestock soon dotted the landscape in what would become Marin County (Marin History Museum website accessed on July 16, 2009).

Rancho Period (A.D. 1822 – 1850)

In 1821, Mexico declared independence from Spain. In 1822, California became a Mexican Territory. Following the secularization of the missions in 1834, representatives of the Mexican government distributed 21 very large land grants, roughly 4,400 acres in Marin County (Marschner 2000). On February 14, 1844, Timothy Murphy was awarded three adjoining parcels, San Pedro, Las Gallinas, and Santa Margarita, as one land grant comprising 21,678 acres. This grant included the lands surrounding the pueblo of San Rafael, west to Red Hill, north to Terra Linda, Marinwood and Lucas Valley, and the land east to Point San Pedro (Spitz 2006). The 1848 gold discovery and subsequent Gold Rush launched a period of landscape change on Marin County. With California's entry into the United States in 1850, legislators created Marin County. The old cattle ranchos gave way to smaller ranches and farms; however, agriculture remained important to the county's economy and culture.

American Period (A.D. 1850 to present)

Surveyors laid out the San Rafael town site in 1850, which became the Marin County seat. The local economy focused on the cattle trade, which flourished in response to the Gold Rush (Levy 1976).

Growth patterns were further accelerated by the completion of the San Rafael and San Quentin Railroad in 1870. This railroad, the first in the county, increased access to and from San Francisco, and popularized Marin County as a retreat for San Francisco families.

The 1937 opening of the Golden Gate Bridge turned southern Marin County into an alternative bedroom community for San Francisco. Later, World War II brought an increased military presence to southern Marin County. Shipyard work and establishment of the United States Army Hamilton Field north of San Rafael was another economic boom to the area (Levy 1976).

Brief Overview of Wastewater Treatment History in the United States

Most cities in the United States have experienced similar trends in the history of sewage treatment; settlement and growth are followed by a continuous need for more efficient and sanitary methods of waste disposal. From the late 1800s, sewage disposal advanced from individuals dumping their own wastes, to a sewer system discharging directly to local waterways, to construction of primary and secondary treatment plants (Rossi 1995). In the late 1880s, many large cities in the United States constructed simple sewage systems that channeled untreated wastewater from residential and industrial sites directly into local rivers, creeks, and other large bodies of water. As the economy and standard of living improved for Americans in the twentieth century, many acquired indoor plumbing, thereby generating more wastewater from showers, baths and toilets. In addition, technological advances increased the number of home appliances that used large quantities of water, such as washing machines, and dishwashers. As wastewater from residents increased in volume and complexity, it became inconvenient for urban residents to rely on decentralized septic tanks for sewage disposal. The nation's waters suffered as a result of all of these combined intensified water uses.

In 1946, Congress passed the Water Pollution Control Act in response to the increasing volume of industrial and residential wastewater contaminating the nation's waters (Burian et al 2000). The law aimed to "restore and maintain the chemical, physical, and biological integrity of the Nation's water" (U.S. Environmental Protection Agency [online]). In 1949, California state legislators enacted the Dickey Water Pollution Act to curtail water pollution that created nuisance from odors or unsightliness. The Dickey Act also created of the State Water Quality Control Board.

In 1954, the Las Gallinas Valley Sanitary District was formed by San Rafael residents who were faced with serious health problems, from failing septic tanks and pollution in Gallinas Creek. The original LGVSD Wastewater Treatment Plant, a secondary treatment facility,[1] was constructed in 1955, and a number of plant enlargements and upgrades have occurred since that time. The LGVSD Wastewater Treatment facility now serves approximately 30,000 residential, and some commercial and light industry customers in northern Marin County. The treatment facility has a design capacity of 2.92 million gallons per day (Woodward Clyde Consultants 1993).

[1] Primary sewage treatment involves the separation, purification, and discharge of liquid waste and the incineration of solid waste (sludge). The key difference between primary and secondary treatment is primary treatment uses mechanical methods to remove pollutants from wastewater. Bar screens, grit chambers, and settling tanks separate large solids and particles prior to disinfection of the remaining liquid. Secondary treatment utilizes bacteria to consume pollutants such as organic solids. Primary treatment methods precede secondary processes (Rossi 1995).

5.0 METHODS AND RESULTS

The methods used to conduct the records search, historic research, and field survey, and the results of those efforts, are described in detail below.

RECORDS SEARCH AND HISTORICAL RESEARCH

GANDA archaeologist Cassidy DeBaker, B.A., conducted a records search at the NWIC of the California Historical Resources Information System at Sonoma State University on July 10, 2009, to compile data regarding previously conducted surveys and recorded cultural resources within a 0.25-mile radius of the APE. The following sources were consulted during the records search:

- NWIC base maps: United States Geological Survey (USGS) 7.5-minute series topographic quadrangles for Novato, California (1980).

- Pertinent survey reports and archaeological site records examined to identify recorded archaeological sites and historic-period built-environment resources (such as buildings, structures, and objects) within or immediately adjacent to the APE;

- The California Department of Parks and Recreation's *California Inventory of Historic Resources* (1976) and the Office of Historic Preservation's *Historic Properties Directory* (OHP) (2007), which combines cultural resources listed on the California Historical Landmarks, California Points of Historic Interest, and those that are listed in or determined eligible for listing in the NRHP and CRHR.

Records Search Results

The results of the records search indicate that approximately 7 cultural resources investigations have been completed within a 0.25-mile radius of the APE. The records search did not identify any previously recorded cultural resources within, or adjacent to, the APE.

Native American Consultation

As part of the consultation process with Native American organizations and individuals, GANDA archaeologist Cassidy DeBaker contacted the NAHC on July 29, 2009 with a request for information about sacred lands that may be within the APE and a list of interested Native American groups and individuals near the project area (Appendix A). A search of the Sacred Lands file housed at the NAHC did not result in the identification of any sacred lands within the APE. On August 4, 2009, the NAHC provided a list of local groups and individuals to contact for further information regarding local knowledge of sacred lands. Ms. DeBaker sent letters and associated maps to the individuals from these local groups on August 6, 2009 (Appendix A). Included in the correspondence were the project description and project maps, with a request that they notify the project consultant if they can provide any information about the APE or if they have concerns about the project.

On September 4, 2009, Nick Tipon, chairman of the Sacred Sites Protection Committee for the Federated Indians of the Graton Rancheria (FIGR), contacted Ms. DeBaker with knowledge of cultural resources, burial areas, and sacred sites in the vicinity of the proposed project area. The FIGR has also requested information regarding project plans and activities prior to any excavation (Appendix A).

FIELD METHODS

On August 7, 2009, architectural historian, Jennifer Lang, M.S., under the supervision of Barbra Siskin, Principal Investigator, conducted an intensive level historic architectural survey within the entire LGVSD Wastewater Treatment Plant facility. All resource components of the wastewater treatment plant were recorded with detailed notes, photographed using a digital camera with color digital imagery, and recorded on a photo log (Appendix B).

FIELD SURVEY RESULTS

The LGVSD Wastewater Treatment Plant, at 300 Smith Ranch Road in San Rafael, California, was constructed in 1955, and designed by J. Warren Nute, Engineer. The plant is a full, secondary treatment plant with a design capacity of 2.9 million gallons per day of dry weather flow, and includes approximately 115 acres of the main plant complex, and approximately 270 acres of irrigated pasture, 40 acres of storage ponds, a 20-acre freshwater wetland, a 10-acre salt marsh, and landscape irrigation. The LGVSD Wastewater Treatment Plant features an administration building, a shop building, a lab/visitor center building, and equipment buildings, along with various wastewater treatment facility equipment, including clarifiers, digesters, biofilters, reactors, and ponds. Together, these features make up a utilitarian group of facilities typical of secondary wastewater treatment plants. The district service area covering approximately 20 square miles, serves a community of approximately 32,000 people in northern San Rafael, predominantly residential, including discharges from some commercial and light industry sources (EOA, Inc. and LGVSD Staff 2009). A number of plant enlargements and upgrades have occurred at the plant since its original construction.

When it was completed 1955, the LGVSD Wastewater Treatment Plant included an access road, a parking area, and sewage treatment works including a sludge digester, a recirculation pump pit, and a biofilter. In 1958, the following features/works were added to the plant facility: a primary and secondary clarifier, an administration building, a chlorination building, and a pump station. In 1964, an additional secondary clarifier, biofilter, and sludge digester were added as was a sludge equipment building (located between the digesters), a grit washer, and a sludge disposal area. In 1975, the sludge gravity thickener, and chlorine contact chamber were constructed. In 1982, the effluent disposal project incorporated the addition of a number of features to the adjacent reclamation area, including: two storage ponds, a fresh water marsh, a salt water marsh, five pastures for irrigation, and supplemental pastures with irrigation pivots (all of these features are outside the boundaries of the project area). The 1982 treatment plant improvements added a larger primary clarifier, a grit chamber, filters (structure), a fixed film reactor, filtered water storage, an equipment building and a shop building (adjacent to the administration building). The former grit separator was rehabilitated, a garage structure was added, and the administrative building received additions including a new exterior stucco coating. In 2005, the grit chamber headwork was modified, the electrical building control room was constructed, and the lab/visitor center was completed. In addition, Pond 1 and Pond 2 were converted to equalization ponds for the Marin Municipal Water District's filter backwash.

Figure 4. The Clarifier # 2 with Primary and Secondary Biofilters behind at the LGVSD Wastewater Treatment Plant.

The LGVSD Wastewater Treatment Plant represents a utilitarian secondary wastewater treatment facility comprised of various industrial and technological features typical of wastewater treatment plants from the 1950s-2009, such as sludge digesters, clarifyers, biofilters, and pump stations. Key components of the system have been updated and enlarged over time.

RESOURCE EVALUATIONS

The LGVSD Wastewater Treatment Plant, constructed in 1955, and substantially updated, altered, and modernized in 1958, 1964, 1975, 1982, and 2005 represents a local resource that provides wastewater treatment for a portion of the City of San Rafael. The LGVSD Wastewater Treatment Plant does not appear to be eligible for listing in the NRHP under Criterion A (events) or the CRHR under Criterion 1 (events). The plant is a utilitarian plant that performs a standard sanitary function, and as such, it is not associated with any unique or special engineering features related to industrial design.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under NRHP Criterion B, or the CRHR under Criterion 2; which address a property's significance for its association with the lives of persons in the past. The LGVSD Wastewater Treatment Plant is not associated with the lives of persons in the past.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under NRHP Criterion C, or the CRHR under Criterion 3; which address architecture, engineering, and workmanship. The treatment plant is a utilitarian facility that does not exhibit any special architecture, design or engineering; the utilitarian nature of the wastewater treatment plant limits any expression of aesthetics. Furthermore, the wastewater treatment plant was not designed or built by a master architect or engineer. The plant is highly utilitarian in nature, the overall arrangement of the system complex is not distinctive and the facilities are not housed in any unusual buildings. Its design and construction are not outstanding or unique, nor do they represent innovations in wastewater treatment technology, such as the Field's Point Sewage Treatment Plant in Providence, Rhode Island, which is listed on the NRHP[2]., and it does not employ any significant engineering features. The wastewater treatment plant design and engineering are not outstanding or unique, and as such, the wastewater treatment plant is not significant under Criterion C or 3.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under the NRHP Criterion D. The wastewater treatment plant has been well documented, and it does not appear to be a source of additional important information.

In summary, the LGVSD Wastewater Treatment Plant does not appear to be eligible for listing in the NRHP under Criteria A ,B, C, or D, or in the CRHR under Criteria 1, 2, 3, or 4, at the local, state or national level.

Furthermore, for a property to be eligible for listing on the NRHP and the CRHR, it must retain sufficient integrity. The seven elements of integrity include location, design, setting, materials, workmanship, feeling and association. However, a resource must meet one or more of the NRHP and CRHR criteria before a determination can be made about its integrity. As such, the LGVSD Wastewater Treatment Plant is not associated with important events or persons in California history, nor does it possess distinctive engineering or technology. The LGVSD Wastewater Treatment Plant is not eligible for inclusion in the NRHP or the CRHR.

[2] The Field's Point Sewage Treatment Plant in Providence Rhode Island (1895-1901), a chemical precipitation plant, is one of the earliest sewage treatment plants of its kind in the U.S., and is the largest of its type ever constructed in the U.S. (Sewage History Website).

6.0 CONCLUSIONS AND RECOMMENDATIONS

No archaeological resources have been identified within the APE for the proposed project. The historic architectural resource with the APE, the LGVSD Wastewater Treatment Plant, is not eligible for inclusion in the NRHP or the CRHR. Due to the nature of the project-related construction, it is not anticipated that ground-disturbing activities will extend into native soils or previously undisturbed areas. Based on background research, review of geomorphologic and historic maps, and the proposed depth of excavation into previously disturbed soil, the APE does not have the potential to contain surface or buried prehistoric living surfaces, and therefore, no archaeological pedestrian survey was conducted. In addition, information provided by Nute Engineering (the engineer/designer of the LGVSD Wastewater Treatment Plant) reveals that the site of the original LGVSD Wastewater Treatment Plant, including the APE, was dynamited in order to remove rock from the site and facilitate the construction of the plant on level ground in 1955. Furthermore, a historic blueprint for the treatment plant depicts the topography of the APE prior to the construction of the facility as steep and hilly (see Appendix C).

UNANTICIPATED ARCHAEOLOGICAL SITES

If there is an unanticipated discovery of archaeological deposits or remains during project implementation, construction crews shall stop all work within 100 feet of the discovery until a qualified archaeologist can assess the discovery and provide recommendations. Resources could include buried historic features, such as artifact-filled privies, wells, and refuse pits, and artifact deposits, concentrations of adobe, stone, or concrete walls or foundations, and concentrations of ceramic, glass, or metal materials. Native American archaeological materials could include obsidian and chert flaked stone tools (such as projectile points and knives), midden (darken soil created culturally from use and containing heat-affected rock, artifacts, animal bones, or shellfish remains), and/or groundstone implements (such as mortars and pestles).

Encountering Human Remains

While the possibility is low, there remains a chance of encountering human remains either in association with prehistoric occupation sites or separately. Section 7050.5 of the California Health and Safety Code states that it is a misdemeanor to knowingly disturb a human burial and Section 5097.99 of the Public Resources Code defines the obtaining or possession of Native American remains or grave goods to be a felony. If human remains are encountered as a result of construction activities, any work in the vicinity shall stop and the County Coroner shall be contacted immediately. In addition, a qualified archaeologist shall be contacted immediately to evaluate the discovery, if a monitor is not already present. If the human remains are Native American in origin, then the Coroner must notify the Native American Heritage Commission within 24 hours of this identification.

7.0 REFERENCES

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APPENDIX A

NATIVE AMERICAN CORRESPONDENCE

GARCIA AND ASSOCIATES   1 SAUNDERS AVENUE   PHONE 415.458.5803
SAN ANSELMO, CA 94960   FAX 415.458.5829

[1] Enclosure(s) [ ] Per your request [x] For your review [x] For your information/use

[ ] Other Total Pages Faxed: 2

To:	Debbie Pilas-Treadway	Date:	July 29, 2009
	Native American Heritage Commission	Client:	Las Gallinas Valley Sanitary District/Nute Engineering
	915 Capitol Mall, #364	Project:	Wastewater Treatment Plant Improvement Project
	Sacramento, CA 95814	Project #:	J552
	(916) 657-5390		

Subject: **Native American Contacts and Inventory Check for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project, San Rafael, Marin County, California.**

Garcia and Associates (GANDA) is providing cultural resource consulting for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project.

This project area lies within Marin County on the **Novato CA 7.5 minute USGS Quadrangle (1993)** (see attachment). There is no Township, Range, or Section data available for this project area; however the project location falls within San Pedro Santa Margarita Y Las Gallinas land grant.

We are requesting a list of representatives from the Native American community to contact regarding cultural resources on this project. In addition, we request that you check your inventory of sacred lands for properties that may be affected by the project in the ¼ mile radius. We have included a map showing the approximate project located.

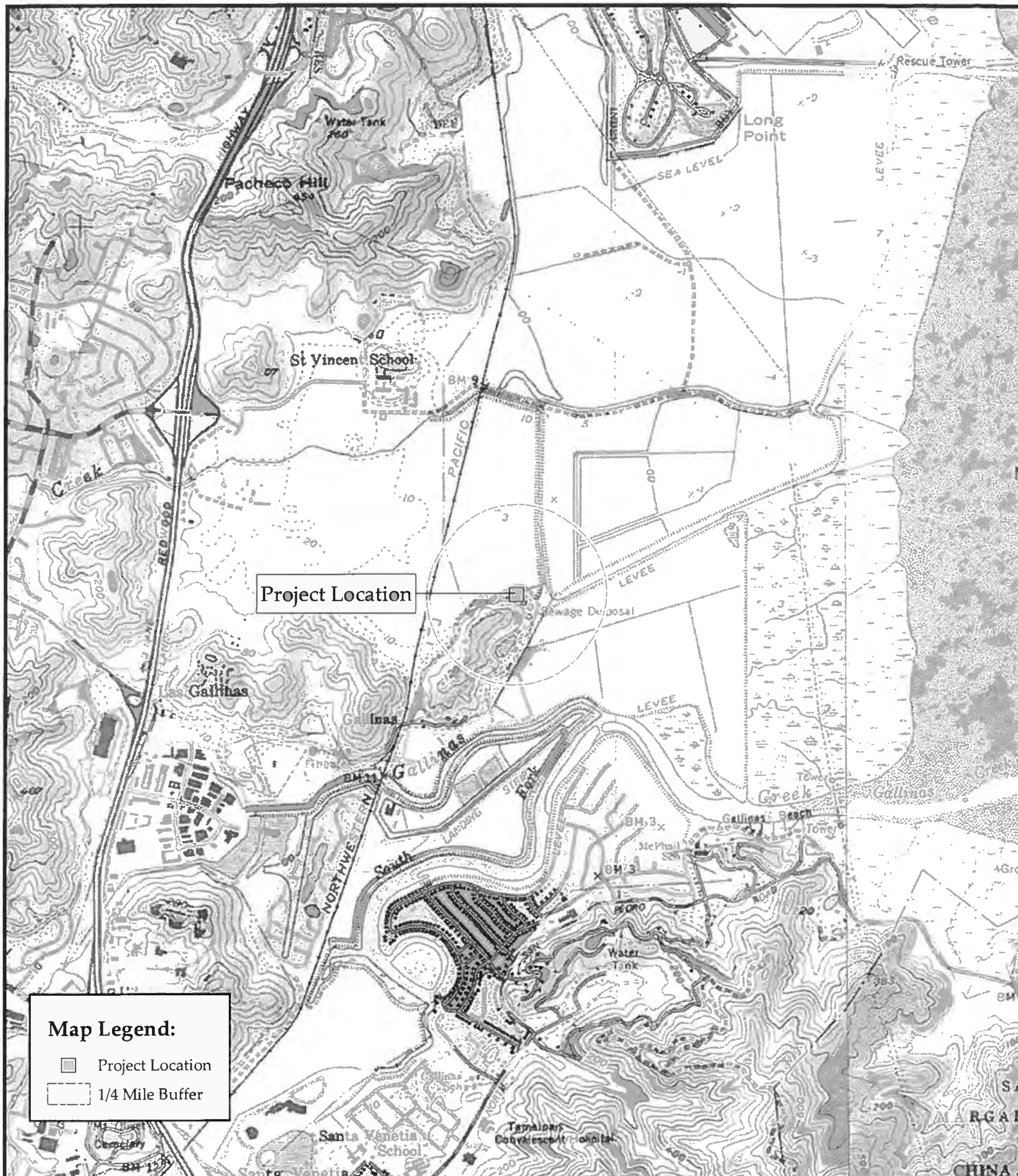
Please contact me at the number below if you have any questions regarding this project or require any additional information. **(415) 458-5803 ext.31**.

Kindly,

Cassidy DeBaker

Cassidy DeBaker, Archaeologist

GANDA



GANDA

Map Scale = 1:24,000 (One Inch = 2,000 ft)

0 500 1,000 2,000 3,000 4,000 5,000 ft

0 125 250 500 750 1,000 1,250 1,500 m

USGS 24K Quad: NOVATO (1980)

Legal Description: SAN PEDRO SANTA MARGARITA Y LAS GALLINAS

N

Records Search Map
Las Gallinas Valley
WWTP Improvements

Marin County, California

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390

August 4, 2009

Cassidy DeBaker
Garcia and Associates

Sent by Fax: 415-458-5829
Number of Pages: 2

Re Proposed: Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project, Marin County.

Dear Ms. DeBaker:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4040.

Sincerely,
Katy Sanchez

Katy Sanchez
Program Analyst

Native American Contact
Marin County
August 4, 2009

The Federated Indians of Graton Rancheria	
Gene Buvelot	
6400 Redwood Drive, Ste 300	Coast Miwok
Rohnert Park , CA 94928	Southern Pomo
coastmiwok@aol.com	
(415) 883-9215 Home	
(415) 259-7819 Cell	

Ya-Ka-Ama	
7465 Steve Olson Lane	Pomo
Forestville , CA 95436	Coast Miwok
info@yakaama.org	Wappo
(707) 887-1541	

The Federated Indians of Graton Rancheria	
Greg Sarris, Chairperson	
6400 Redwood Drive, Ste 300	Coast Miwok
Rohnert Park , CA 94928	Southern Pomo
coastmiwok@aol.com	
707-566-2288	
707-566-2291 - fax	

The Federated Indians of Graton Rancheria	
Frank Ross	
440 Apt. N Alameda del Prado	Coast Miwok
Novato , CA 94949	Southern Pomo
miwokone@yahoo.com	
(415) 269-6075	

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Las Gallinas Valley Sanitary District Wastewater TReatment Plant Improvement Project, San Rafael; Marin County.

GARCIA AND ASSOCIATES 1 SAUNDERS AVENUE PHONE 415.458.5803
SAN ANSELMO, CA 94960 FAX 415.458.5829

August 6, 2009

Ya-Ka-Ama
7465 Steve Olson Lane
Forestville, CA 95436

RE: **Cultural resources Inventory Check for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project, San Rafael, Marin County, California.**

Dear Ya-Ka-Ama:

Garcia and Associates (GANDA) is providing cultural resource consulting for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project. The project proposes to make improvements to the existing facilities (i.e. intermediate clarifiers) in order to rehabilitate the Wastewater Treatment Plant. This project area lies within Marin County on the **Novato CA 7.5 minute USGS Quadrangle (1993)** (see attachment). There is no Township, Range, or Section data available for this project area; however the project location falls within San Pedro Santa Margarita Y Las Gallinas land grant.

GANDA has checked the records of the California Native American Heritage Commission (NAHC). The NAHC reports that a search of the sacred lands file failed to indicate the presence of Native American cultural resources in the vicinity of the project area. However, they recommended that we contact you to provide an opportunity for you to contribute information about cultural resources in this project area. An important element of our investigation is to identify sites, resources, or locations of cultural importance to the local Native American community. We would appreciate receiving any information you have concerning these resources in the project area. If you cannot supply information but know of others who can, we would appreciate it if you would contact us with the names of these individuals.

We encourage you to participate in this process. Feel free to contact me with any information, questions or concerns you may have.

Sincerely, Cassidy DeBaker

Cassidy DeBaker
Archaeologist
(415) 458-5803 ext.31.

GARCIA AND ASSOCIATES
1 SAUNDERS AVENUE
SAN ANSELMO, CA 94960
PHONE 415.458.5803
FAX 415.458.5829

August 6, 2009

The Federated Indians of Graton Rancheria
Greg Sarris
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: **Cultural resources Inventory Check for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project, San Rafael, Marin County, California.**

Dear Mr. Sarris:

Garcia and Associates (GANDA) is providing cultural resource consulting for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project. The project proposes to make improvements to the existing facilities (i.e. intermediate clarifiers) in order to rehabilitate the Wastewater Treatment Plant. This project area lies within Marin County on the **Novato CA 7.5 minute USGS Quadrangle (1993)** (see attachment). There is no Township, Range, or Section data available for this project area; however the project location falls within San Pedro Santa Margarita Y Las Gallinas land grant.

GANDA has checked the records of the California Native American Heritage Commission (NAHC). The NAHC reports that a search of the sacred lands file failed to indicate the presence of Native American cultural resources in the vicinity of the project area. However, they recommended that we contact you to provide an opportunity for you to contribute information about cultural resources in this project area. An important element of our investigation is to identify sites, resources, or locations of cultural importance to the local Native American community. We would appreciate receiving any information you have concerning these resources in the project area. If you cannot supply information but know of others who can, we would appreciate it if you would contact us with the names of these individuals.

We encourage you to participate in this process. Feel free to contact me with any information, questions or concerns you may have.

Sincerely,

Cassidy DeBaker

Cassidy DeBaker
Archaeologist
(415) 458-5803 ext.31.

GARCIA AND ASSOCIATES
1 SAUNDERS AVENUE
SAN ANSELMO, CA 94960
PHONE 415.458.5803
FAX 415.458.5829

August 6, 2009

The Federated Indians of Graton Rancheria
Frank Ross
440 Apt. N Alameda del Prado
Novato, CA, 94949

RE: **Cultural resources Inventory Check for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project, San Rafael, Marin County, California**

Dear Mr. Ross:

Garcia and Associates (GANDA) is providing cultural resource consulting for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project. The project proposes to make improvements to the existing facilities (i.e. intermediate clarifiers) in order to rehabilitate the Wastewater Treatment Plant. This project area lies within Marin County on the **Novato CA 7.5 minute USGS Quadrangle (1993)** (see attachment). There is no Township, Range, or Section data available for this project area; however the project location falls within San Pedro Santa Margarita Y Las Gallinas land grant.

GANDA has checked the records of the California Native American Heritage Commission (NAHC). The NAHC reports that a search of the sacred lands file failed to indicate the presence of Native American cultural resources in the vicinity of the project area. However, they recommended that we contact you to provide an opportunity for you to contribute information about cultural resources in this project area. An important element of our investigation is to identify sites, resources, or locations of cultural importance to the local Native American community. We would appreciate receiving any information you have concerning these resources in the project area. If you cannot supply information but know of others who can, we would appreciate it if you would contact us with the names of these individuals.

We encourage you to participate in this process. Feel free to contact me with any information, questions or concerns you may have.

Sincerely,

Cassidy DeBaker

Cassidy DeBaker
Archaeologist
(415) 458-5803 ext.31.

GARCIA AND ASSOCIATES 1 SAUNDERS AVENUE PHONE 415.458.5803
SAN ANSELMO, CA 94960 FAX 415.458.5829

August 6, 2009

The Federated Indians of Graton Rancheria
Gene Buvelot
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: **Cultural resources Inventory Check for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project, San Rafael, Marin County, California.**

Dear Mr. Buvelot:

Garcia and Associates (GANDA) is providing cultural resource consulting for the Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Project. The project proposes to make improvements to the existing facilities (i.e. intermediate clarifiers) in order to rehabilitate the Wastewater Treatment Plant. This project area lies within Marin County on the **Novato CA 7.5 minute USGS Quadrangle (1993)** (see attachment). There is no Township, Range, or Section data available for this project area; however the project location falls within San Pedro Santa Margarita Y Las Gallinas land grant.

GANDA has checked the records of the California Native American Heritage Commission (NAHC). The NAHC reports that a search of the sacred lands file failed to indicate the presence of Native American cultural resources in the vicinity of the project area. However, they recommended that we contact you to provide an opportunity for you to contribute information about cultural resources in this project area. An important element of our investigation is to identify sites, resources, or locations of cultural importance to the local Native American community. We would appreciate receiving any information you have concerning these resources in the project area. If you cannot supply information but know of others who can, we would appreciate it if you would contact us with the names of these individuals.

We encourage you to participate in this process. Feel free to contact me with any information, questions or concerns you may have.

Sincerely,

Cassidy DeBaker

Cassidy DeBaker
Archaeologist
(415) 458-5803 ext.31.

FEDERATED INDIANS OF GRATON RANCHERIA

Federated Indians of Graton Rancheria
Sacred Sites Protection Committee
6400 Redwood Drive Suite 300
Rohnert Park, CA 94928

Sept. 4, 2009

Cassidy DeBaker
Garcia and Associates
1 Saunders Avenue
San Anselmo, CA 94960

RE: Las Gallinas Valle Sanitary District

Dear Ms. DeBaker:

The Federated Indians of Graton Rancheria (FIGR), a federally recognized Tribe, received your correspondence regarding the Las Gallinas Valle Sanitary District Project in Marin County, CA.

The Tribe has knowledge of many cultural resources, burial areas and sacred sites in the vicinity of this project. This entire watershed was used by our ancestors, including the very old pre historic and buried sites at the margins of the Bay.

The Tribe requests the agency contact us regarding further studies of this site and avoidance or mitigation measures prior to the submission of information to the permitting agencies. We also request information about the scope of the project, especially plans for soil excavation and disturbance at the site. A future evaluation of culturally important plants for the project may also be necessary.

After reviewing the above information, the Tribe will have comments and recommendations regarding this project.

Respectfully,

Nick Tipon
Chairman: Sacred Sites Protection Committee
ntipon@comcast.net
(707) 478-1737

APPENDIX B

DPR 523 FORMS (SITE RECORDS)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-21-002672
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** Las Gallinas Sanitary District Wastewater Treatment Plant

P1. Other Identifier:
***P2. Location:** ☒ **Not for Publication** ☐ **Unrestricted** ***a. County:** Marin County
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Novato **Date:** 1980 **T** ;**R** ; **¼ of** **¼ of Sec** **;** M.D. **B.M.**
c. Address: 300 Smith Ranch Road City: San Rafael, CA Zip: 94903
d. UTM: Zone: 10 ; 542416 mE/ 4208760 mN (G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The LGVSD Wastewater Treatment Plant, located at 300 Smith Ranch Road in San Rafael, California, was constructed in 1955, and designed by J. Warren Nute, Engineer. The plant is a full, secondary treatment plant with a design capacity of 2.9 million gallons per day of dry weather flow, and includes approximately 115 acres of the main plant complex, and approximately 270 acres of irrigated pasture, 40 acres of storage ponds, a 20 acre freshwater wetland, a 10 acre salt marsh, and landscape irrigation. The LGVSD Wastewater Treatment Plant features an administration building, a shop building, a lab/visitor center building, and equipment buildings, along with various wastewater treatment facility equipment including clarifiers, digesters, biofilters, reactors, and ponds. Together these features make up a utilitarian group of facilities typical of secondary wastewater treatment plants. The district service area covering approximately 20 square miles, serves a community of approximately 32,000 people in northern San Rafael, predominantly residential, including discharges from some commercial and light industry sources (EOA, Inc. and LGVSD Staff 2009). A number of plant enlargements and upgrades have occurred at the plant since its original construction in 1954. Continued on page 4.

***P3b. Resource Attributes:** (List attributes and codes) HP 9 (Public Utility Building), HP8 (Industrial Building), PP11 (Engineering Structure).
***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)
P5a. Photo or Drawing (Photo required for buildings, structures, and objects.

P5b. Description of Photo: (View, date, accession #) View of Clarifier # 1 and #2 with Sludge Scum Pit between, and Biofilers in the background, August 7, 2009.
***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
Las Gallinas Valley Sanitary District
300 Smith Ranch Road
San Rafael, CA 94903

***P8. Recorded by:** (Name, affiliation, and address)
Jennifer Lang, MS
Garcia and Associates (GANDA)
1 Saunders Avenue
San Anselmo, CA 94960
***P9. Date Recorded:** August 7, 2009
***P10. Survey Type:** (Describe) Intensive
***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") *Cultural Resources Inventory and Evaluation of the Las Gallinas Valley Samitary District Wastewater Treatment Plant, San Rafael, Marin County, California*. Prepared for the Las Gallinas Valley Sanitary District. Prepared by Garcia and Associates (GANDA), September 2009.
***Attachments:** ☐NONE ☒Location Map ☒☐Sketch 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):

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code**

***Resource Name or #** (Assigned by recorder) Las Gallinas Sanitary District Wastewater Treatment Plant

B1.Historic Name: Las Gallinas Sanitary District Wastewater Treatment Plant
B2. Common Name:
B3. Original Use: Wastewater Treatment Facility B4. Present Use: Wastewater Treatment Facility
***B5. Architectural Style:**
***B6. Construction History:** (Construction date, alterations, and date of alterations)
Constructed in 1955 with a number of plant enlargements and upgrades in 1958, 1964, 1975, 1982, and 2005.
***B7. Moved?** ☒**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: Warren J. Nute, Engineer b. Builder:
***B10. Significance: Theme:** N/A **Area:**
Period of Significance: N/A **Property Type:** N/A **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The LGVSD Wastewater Treatment Plant, constructed in 1955, and substantially updated, altered, and modernized in 1958, 1964, 1975, 1982, and 2005, represents a locale resource that provides wastewater treatment for a portion of the City of San Rafael. The LGVSD Wastewater Treatment Plant does not appear to be eligible for listing in the NRHP under Criterion A (events) or the CRHR under Criterion 1 (events). The plant is a utilitarian plant that performs a standard sanitary function, and as such, it is not associated with any unique or special engineering features related to industrial design.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under NRHP Criterion B, or the CRHR under Criterion 2. Criteria B and 2 address a property's significance for its association with the lives of persons in the past. The LGVSD Wastewater Treatment Plant is not associated with the lives of persons in the past.

The LGVSD Wastewater Treatment Plant does not appear to be eligible under NRHP Criterion C (architecture/engineering/workmanship), or the CRHR under Criterion 3 (architecture/engineering/workmanship). The treatment plant is a utilitarian facility that does not exhibit any special architecture, design or engineering; the utilitarian nature of the wastewater treatment plant limits any expression of aesthetics. Furthermore, the wastewater treatment plant was not designed or built by a master architect or engineer. The plant is highly utilitarian in nature, the overall arrangement of the system complex is not distinctive and the facilities are not housed in any unusual buildings. Its design and construction do not represent innovations in wastewater treatment technology, and it does not employ any significant engineering features. The wastewater treatment plant design and engineering are not outstanding or unique, and as such, the wastewater treatment plant is not significant under Criterion C or 3.

B11. Additional Resource Attributes: (List attributes and codes) HP9 (Public Utility Building), HP8 (Industrial Building), HP11 (Engineering Structure).

***B12. References:** See Continuation Sheet, page 10.

B13. Remarks:

***B14. Evaluator:** Jennifer Lang, M.S.
Garcia and Associates (GANDA)
1 Saunders Avenue
San Anselmo, CA 94960

***Date of Evaluation:** August 7, 2009

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

The LGVSD Wastewater Treatment Plant does not appear to be eligible under the NRHP Criterion D. The wastewater treatment plant has been well documented, and it does not appear to be a source of additional important information.

In summary, the LGVSD Wastewater Treatment Plant does not appear to be eligible for listing in the NRHP under Criteria A ,B, C, or D, or in the CRHR under Criteria 1, 2, 3, or 4, at the local, state or national level.

For a property to be eligible for listing on the NRHP and the CRHR, it must retain sufficient integrity. The seven elements of integrity include location, design, setting, materials, workmanship, feeling and association. However, a resource must meet one or more of the NRHP and CRHR criteria before a determination can be made about its integrity. As such, the LGVSD Wastewater Treatment Plant is not associated with important events or persons in California history, nor does it possess distinctive engineering or technology. The LGVSD Wastewater Treatment Plant is not eligible for inclusion in the NRHP or the CRHR.

Filter structure.

***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant
***Recorded by:** Jennifer Lang ***Date:** September 2009 ☒ Continuation ☐ Update

Continued from page 1.

The LGVSD Wastewater features an administration building, a shop building, a garage structure, a lab/visitor center building, and equipment buildings, along with various wastewater treatment facility equipment, including clarifiers, digesters, biofilters, reactors, and ponds. Together these structures make up a utilitarian group of facilities typical of secondary wastewater treatment plants.

When it was completed in 1955, the LGVSD Wastewater Treatment Plant included an access road, a parking area, and sewage treatment works, including a sludge dispenser, a recirculation pump pit, and a biofiler. A number of plant enlargements and upgrades have occurred at the plant since its original construction in 1954. In 1958, the following features/works were added to the plant facility: a primary and secondary clarifier, an administration building, a chlorination building, and a pump station. In 1964, the following additional features/works were added to the facility: an additional secondary clarifier, a biofilter, an additional sludge digester, a sludge equipment building (located between the digesters), a grit washer, and a sludge digester area. In 1975, the sledge gravity thickener and the chlorine contact chamber were constructed. In 1982, the effluent disposal project included the addition of a number of features for the adjacent reclamation area, including two storage ponds, a fresh water marsh, a salt water marsh, five pastures for irrigation, and supplemental pastures with irrigation pivots (all of these features are located outside the boundaries of the project area). In 1975, a chlorine contact basin was added to the facility. The 1982, treatment plant improvements included the following: the addition of a larger primary clarifier, a grit chambers and equipment building, filters (structure), a fixed film reactor, filtered water storage, shop building (adjacent to the administration building), the former grit separator was rehabilitated, the garage structures were added, and the administrative building received additions including a new exterior stucco coating. In 2005, the grit chambers head works was modified, the electrical building control room was constructed, and the lab/visitor center was completed. In addition, Pond 1 and Pond 2 were converted to equalization ponds for the Marin Municipal Water District's filter backwash.

The LGVSD Wastewater Treatment Plant represents a utilitarian secondary wastewater treatment facility comprised of various industrial and technological features typical of wastewater treatment plants from the 1950s-2009, such as sludge digesters, clarifyers, biofilters, and pump stations. Key components of the system have been updated and enlarged over time.

Most cities in the United States have experienced similar trends in the history of sewage treatment; settlement and growth are followed by a continuous need for more efficient and sanitary methods of waste disposal. From the late 1800s, sewage disposal advanced from individuals dumping their own wastes, to a sewer system discharging directly to local waterways, to construction of primary and secondary treatment plants (Rossi 1995). In the late 1880s, many large cities in the United States constructed simple sewage systems that channeled untreated wastewater from residential and industrial sites directly into local rivers, creeks, and other large bodies of water. As the economy and standard of living improved for Americans in the twentieth century, many acquired indoor plumbing, thereby generating more wastewater from showers, baths and toilets. In addition, technological advances increased the number of home appliances that used large quantities of water, such as washing machines and dishwashers. As wastewater from residents increased in volume and complexity, it became inconvenient for urban residents to rely on decentralized septic tanks for sewage disposal. The nation's waters suffered as a result of all of these combined intensified water uses.

In 1946, Congress passed the Water Pollution Control Act in response to the increasing volume of industrial and residential wastewater contaminating the nation's waters (Burian et al 2000). The law aimed to "restore and maintain the chemical, physical, and biological integrity of the Nation's water" (U.S. Environmental Protection Agency [online]). In 1949, California state legislators enacted the Dickey Water Pollution Act to curtail water pollution that created nuisance from odors or unsightliness. The Dickey Act also created the State Water Quality Control Board.

In 1954, the Las Gallinas Valley Sanitary District was formed by San Rafael residents who were faced with serious health problems from failing septic tanks and pollution in Gallinas Creek. The original LGVSD Wastewater Treatment Plant, a secondary treatment facility, was constructed in 1955, and a number of plant enlargements and upgrades have occurred since that time. The LGVSD Wastewater Treatment facility now serves approximately 30,000 residential, and some commercial and light industry customers in northern Marin County. The treatment facility has a design capacity of 2.9 million gallons per day (Woodward Clyde Consultants 1993).

Grit washer.

CONTINUATION SHEET

 ***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Recorded by:** Jennifer Lang, M.S. ***Date:** September 2009 ☒ Continuation ☐ Update

View of shop building and the administrative offices of the Las Gallinas Valley Sanitary District.

View of the administrative building at the Las Gallinas Valley Sanitary District.

Page 7 **of** 11 ***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Recorded by:** Jennifer Lang, M.S. ***Date:** September 2009 ☒ Continuation ☐ Update

Primary Digester.

Secondary Digester.

Clarifier #1 and #2 with Sludge Scum Pit in the center, and Primary and Secondary Biofilters in the background.

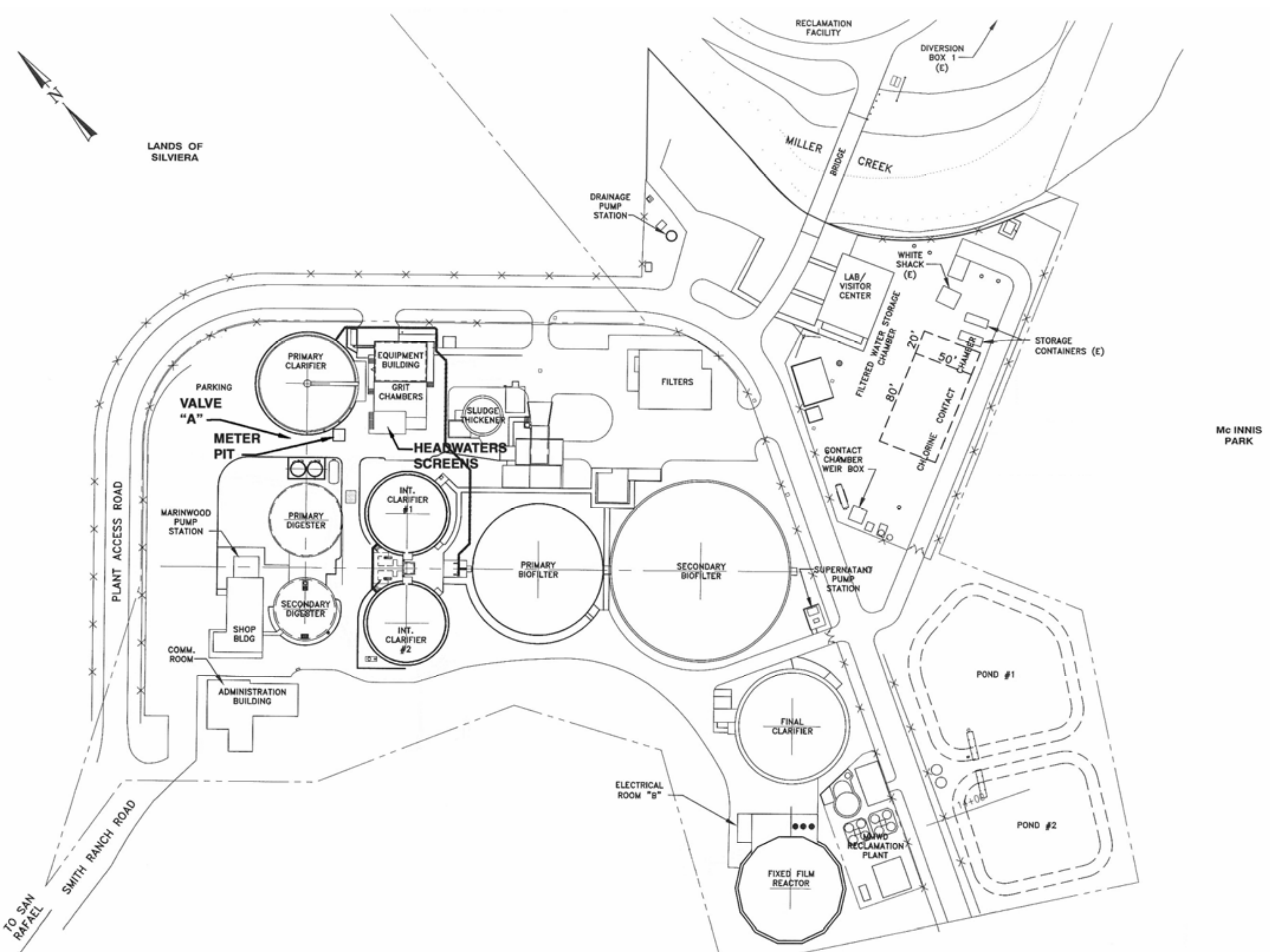
Sludge Scum Pit.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI#
Trinomial

 ***Resource Name or #** (Assigned by recorder) Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Drawn By:** Rad Smith, Garcia and Associates *Date: September 2009



SITE PLAN
SCALE: 1" = 40'

NOTE: Include bar scale and north arrow.

B12. References:

Burian, Stephen J., Stephan J. Nix, Robert E. Pitt, and S. Rocky Durrans.

2000 "Urban Wastewater Management in the United States: Past, Present, and Future," Journal *of Urban Technology*, 2000, *vol*. 7, no. 3.

EOA, Inc, and Las Gallinas Valley Sanitary District Staff
2009 Las Gallinas Valley Sanitary District Sewer System Management Plan. San Rafael, CA.

Rossi, Mary C.

1995 "The History of Sewage Treatment in the City of Buffalo, New York", in *Middle States Geographer*, 1995, 28:9-19.

United States Environmental Protection Agency (USEPA)

Accessed August 11, 2009. http://www.epa.gov/history/index.htm

United States Geological Survey (USGS)

1980 Novato, California, Quadrangle Map. U.S. Geological Survey, Washington, D.C.

Woodward Clyde-Consultants

1993 *Wetlands as a Part of Reuse and Disposal: Las Gallinas Valley Sanitary District.* U.S. Environmental Protection Agency (Requisition No. A22190).

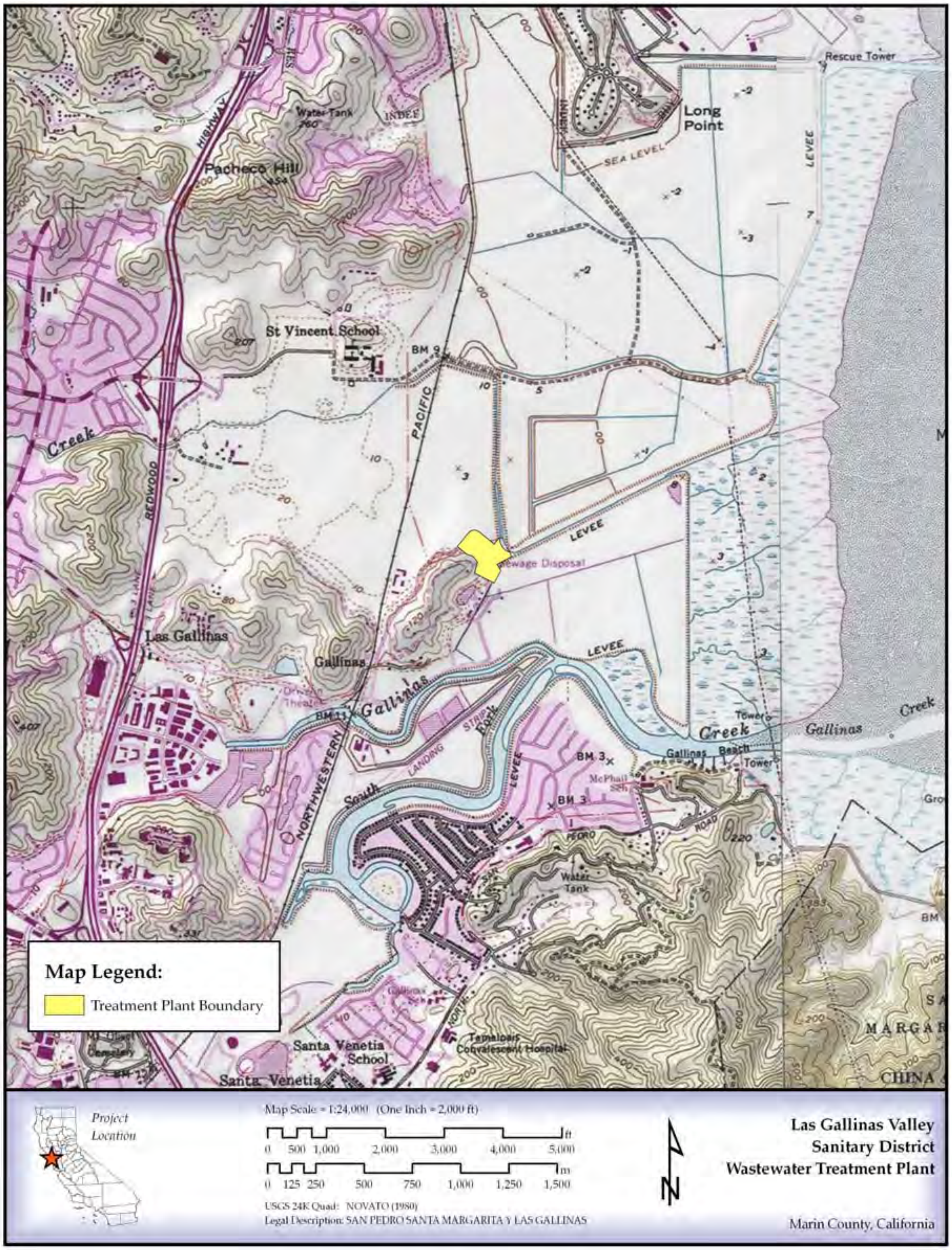
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
Primary #
HRI #

LOCATION MAP

Trinomial

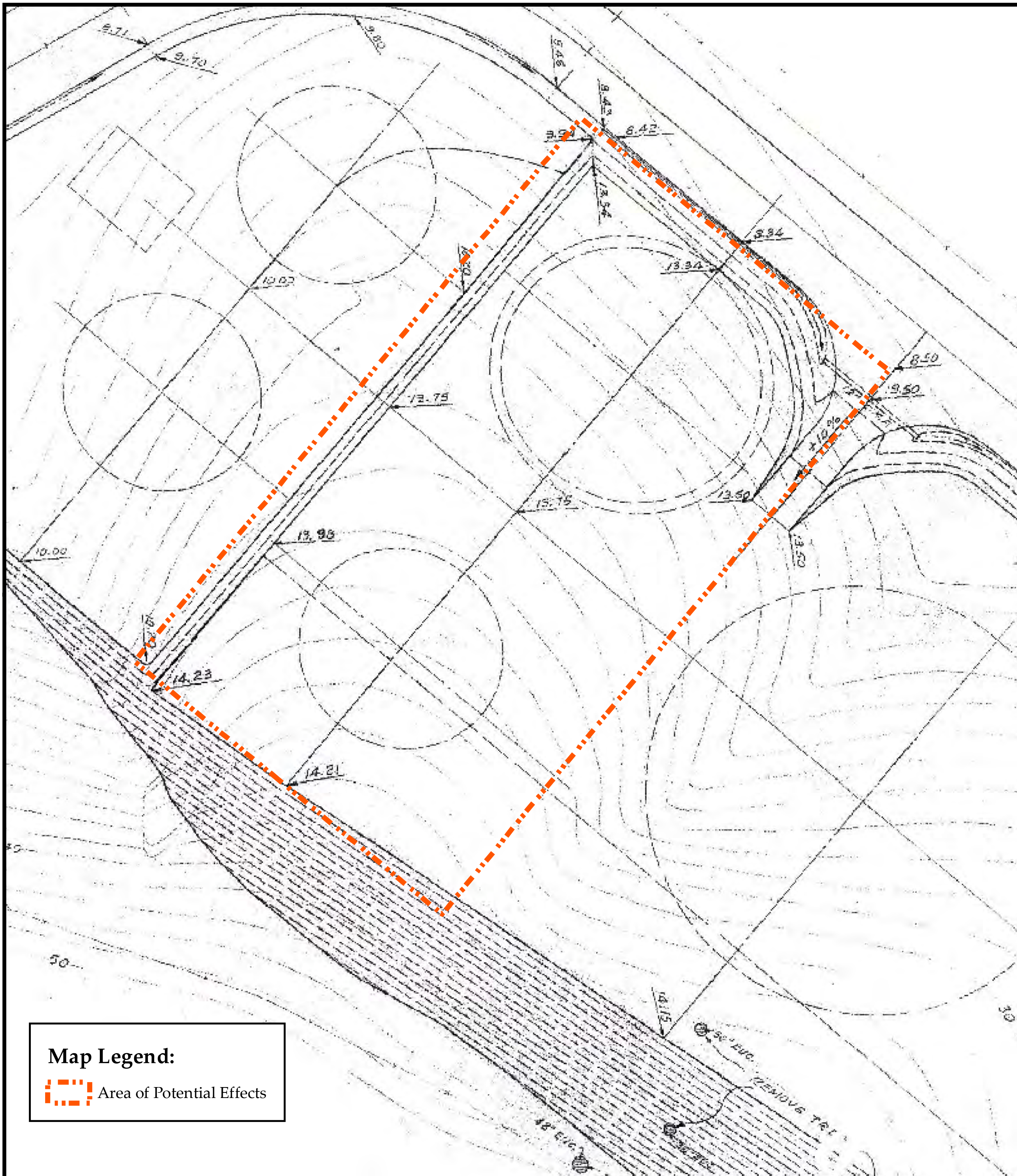
 ***Resource Name or #:** Las Gallinas Valley Sanitary District Wastewater Treatment Plant

***Map Name** USGS 7.5' Quad Novato, CA ***Scale** 1:24000 *Date of Map: 1980



APPENDIX C

MAPS: 1955 BLUEPRINT AND AREA OF POTENTIAL EFFECTS; 2008 AREA OF POTENTIAL EFFECTS



Map Scale = 1:300 (One Inch = 25 ft)

0 10 20 40 60 80 ft

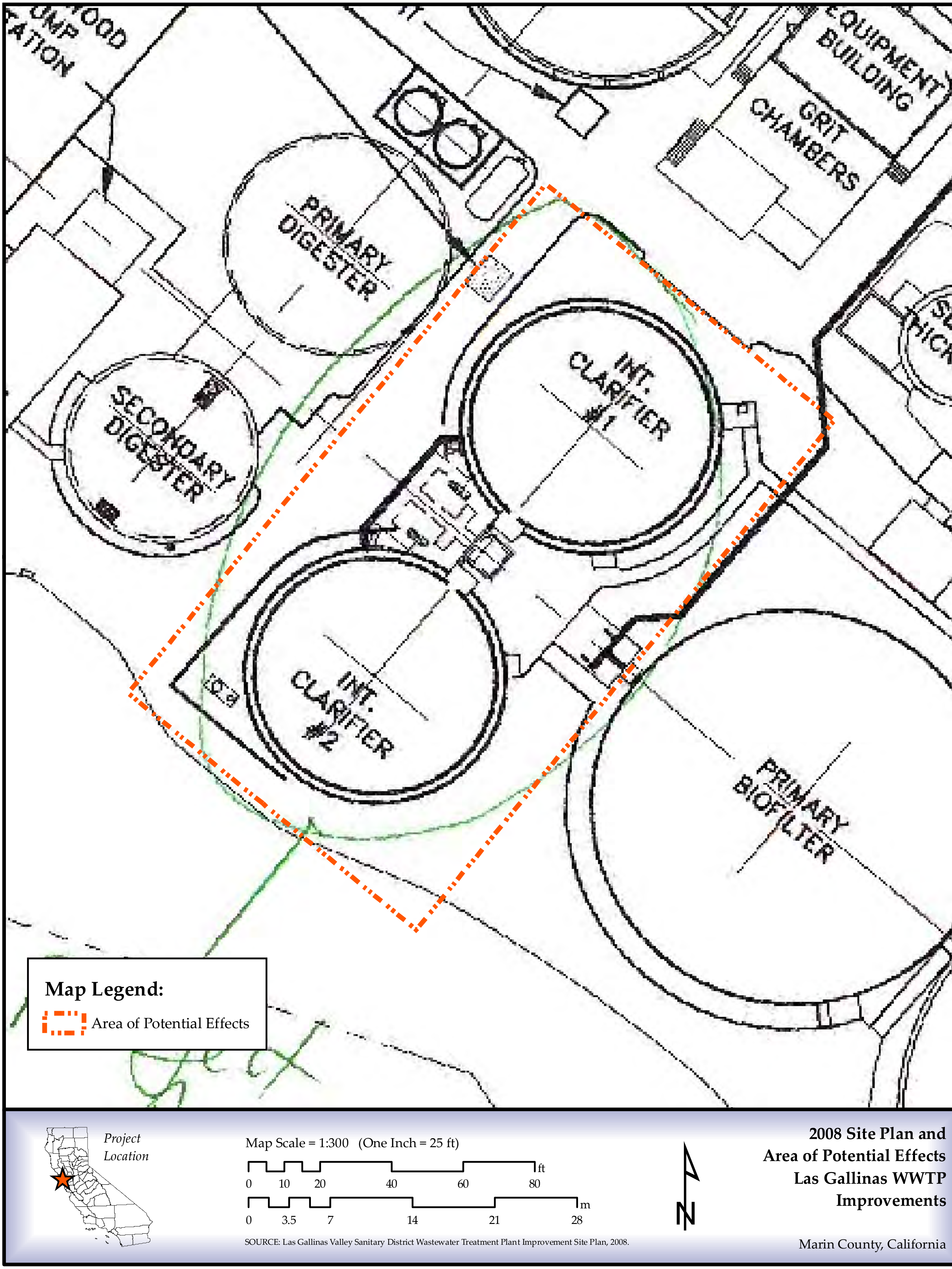
0 3.5 7 14 21 28 m

SOURCE: Las Gallinas Valley Sanitary District Wastewater Treatment Plant Site Grading Plan, 1955.

N

1955 Blueprint and Area of Potential Effects Las Gallinas WWTP Improvements

Marin County, California



SOURCE: Las Gallinas Valley Sanitary District Wastewater Treatment Plant Improvement Site Plan, 2008.

2008 Site Plan and Area of Potential Effects Las Gallinas WWTP Improvements

Marin County, California

APPENDIX C

NAHC and Tribal Correspondence

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 20, 2016

Katy Sanchez
Associate Government Program Analyst
Native American Heritage Commission

Subject: ***NAHC Sacred Lands Records Search Request for the Las Gallinas Valley Sanitary District in San Rafael, Marin County, California***

Dear Ms. Sanchez,

Dudek is conducting a cultural resources survey project for the Las Gallinas Valley Sanitary District. The approximately 7.4-acre project site is located in San Rafael, California at 300 Smith Ranch Road (Figure 1). The project site is located approximately one mile east of U.S. Highway 101 and one mile west of the west shore of San Pablo Bay. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5' quadrangle.

Dudek is requesting a NAHC search for any sacred sites, traditional cultural properties, or other Native American cultural resources that may fall within a one-mile buffer of the proposed project location (Figure 1). Please provide contact information for all Native American tribal representatives that should be consulted regarding these project activities. This information can be faxed to 760-632-0164.

If you have any questions about this investigation, please contact me directly by email or phone.

Regards,

Scott Wolf
Archaeologist
DUDEK
Phone: (760) 479-3814
Cell: (858) 775-9028
Email: swolf@dudek.com

Attachments:
Figure1. Project location map.

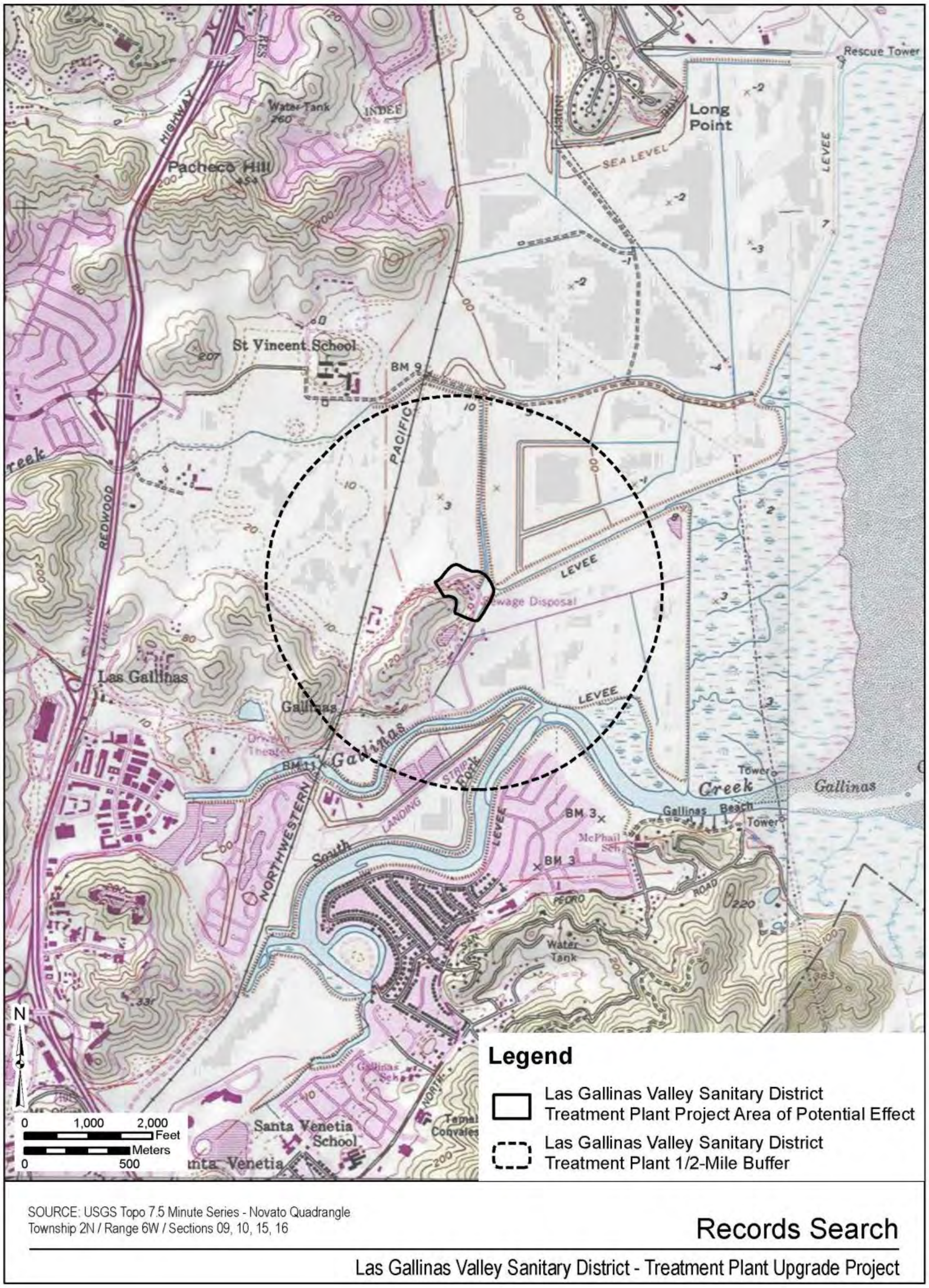


Figure 1. Project location map

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

February 18, 2016

Scott Wolf
Dudek
605 Third Street
Encinitas, CA 92024

Email to: swolf@dudek.com

Re: Las Gallinas Valley Sanitary District

Dear Mr. Wolf,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at Joshua.standinghorse@nahc.ca.gov.

Sincerely,

Joshua Standing Horse
Associate Governmental Program Analyst

Native American Contact List
Marin County
February 18, 2016

The Federated Indians of Graton Rancheria Greg Sarris, Chairperson 6400 Redwood Drive, Ste Rohnert Park, CA 94928 coastmiwok@aol.com (707) 566-2288 Office (707) 566-2291 Fax	Coast Miwok Southern Pomo
The Federated Indians of Graton Rancheria Gene Buvelot 6400 Redwood Drive, Ste 300 Rohnert Park, CA 94928 coastmiwok@aol.com (415) 279-4844 Cell (707) 566-2288 ext 103	Coast Miwok Southern Pomo

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Las Gallinas Valley Sanitary District, Marin County.

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.885.8372

March 1, 2016

Mr. Gene Buvelot,
The Federated Indians of Graton Rancheria
6400 Redwood Dr. #300
Rohnert Park, CA 94928

Subject: Information Request for the Las Gallinas Sanitary District Project, Marin County, California

Dear Mr. Buvelot,

Las Gallinas Sanitary District is proposing improvements to their existing facilities in San Rafeal, California (Figure 1). The area is bounded by Smith Ranch Rd to the north and McInnis Park Golf Club to the south. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5' quadrangle.

The Native American Heritage Commission conducted a Sacred Lands file search. No Native American cultural resources were identified within a one-half mile distance of the proposed project area. Intensive pedestrian survey and a NWIC records search also did not identify any Native American archaeological within the project boundaries or the surrounding records search area. I am writing to inquire if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project.

If you have any information or concerns pertaining to such information, please contact me by phone or email.

Respectfully,

Adam Giacinto, M.A., RPA
Archaeologist
DUDEK
Phone: (760) 479-4252
Cell: (760) 846-5755
Email: agiacinto@dudek.com

Attachments: *Figure 1. Project location map*

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.885.8372

March 1, 2016

Mr. Greg Sarris, Chairperson
The Federated Indians of Graton Rancheria
6400 Redwood Dr. #300
Rohnert Park, CA 94928

Subject: Information Request for the Las Gallinas Sanitary District Project, Marin County, California

Dear Mr. Sarris,

Las Gallinas Sanitary District is proposing improvements to their existing facilities in San Rafeal, California (Figure 1). The area is bounded by Smith Ranch Rd to the north and McInnis Park Golf Club to the south. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5' quadrangle.

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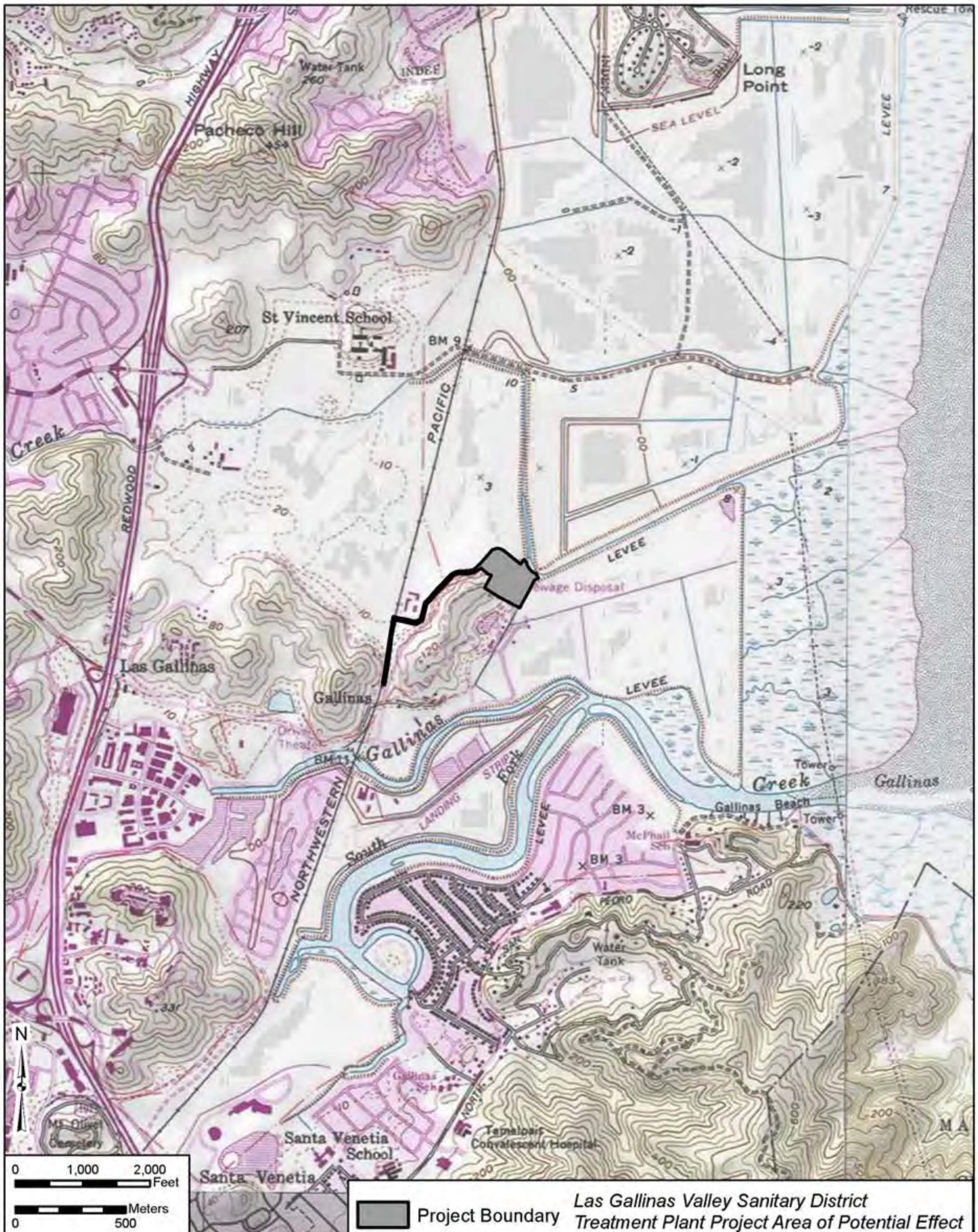
Respectfully,

Adam Giacinto, M.A., RPA
Archaeologist
DUDEK
Phone: (760) 479-4252
Cell: (760) 846-5755
Email: agiacinto@dudek.com

Attachments: *Figure 1. Project location map*



Project Boundary

Las Gallinas Valley Sanitary District
Treatment Plant Project Area of Potential Effect

SOURCE: USGS Topo 7.5 Minute Series - Novato Quadrangle
Township 2N / Range 6W / Sections 09, 10, 15, 16

Information Request Map

Las Gallinas Valley Sanitary District - Treatment Plant Upgrade Project

Adam Giacinto

From: Buffy McQuillen <BMcQuillen@gratonrancheria.com>
Sent: Monday, August 01, 2016 3:28 PM
To: Adam Giacinto
Subject: RE: Las Gallinas Valley Sanitary District Secondary Treatment Upgrades- Cultural Outreaach

Hello Adam,
Thank you for providing this information to me. I see that a letter came in the mail to the Chairman in March 2016. We apologize for not sending you a response. The area has potential to have buried cultural deposits. Would you please send me project details, as well as the results from the Northwest Information Center?

Respectfully,
Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291
bmcquillen@gratonrancheria.com

From: Adam Giacinto [mailto:agiacinto@dudek.com]
Sent: Monday, August 01, 2016 1:20 PM
To: Buffy McQuillen <BMcQuillen@gratonrancheria.com>
Subject: Las Gallinas Valley Sanitary District Secondary Treatment Upgrades- Cultural Outreaach

Hi Buffy,

I am following up on a call I just made relating to tribal information outreach for the Las Gallinas Valley Sanitary District (District) Secondary Treatment Upgrades. As recommended by a response letter provided by the NAHC to our requested search of the Sacred Lands File, we sent the attached letters in March of this year to Federated Indians of Graton Rancheria tribal representatives. Las Gallinas Sanitary District is proposing improvements to their existing facilities in San Rafael, California. The area is bounded by Smith Ranch Rd to the north and McInnis Park Golf Club to the south. The project is located in Section 10, Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) Novato 7.5’ quadrangle (see attached map). Nearly all portions of this project area have been previously developed, and the project appears to be of low potential to encounter yet-identified cultural resources.

No Native American cultural resources were identified within, or a surrounding one-half mile distance, of the proposed project area as part of the Sacred Lands file search. Intensive pedestrian survey and a NWIC records search also did not identify any Native American archaeological within the project boundaries or the surrounding records search area. I am writing to inquire if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project.

Please feel free to contact me directly should you have any comments or concerns relating to the proposed project.

Regards,

Adam Giacinto, M.A., RPA
Archaeologist

DUDEK
853 Lincoln Way, Suite 208
Auburn, CA 95603
Office: 760.479.4252
Cell: 760.846.5755
www.Dudek.com

Adam Giacinto

From: Adam Giacinto
Sent: Thursday, August 04, 2016 11:40 AM
To: 'Buffy McQuillen'
Subject: RE: Las Gallinas Valley Sanitary District Secondary Treatment Upgrades- Cultural Outreaach

Hi Buffy,

I received approval to provide the draft cultural report and the records search results. Please use the link below to download this information.

Link Removed for Confidentiality

I'll add any comments you may have to the record of communication in an updated report.

Thanks, and let me know if you have any trouble with the link,

Adam

Adam Giacinto, M.A., RPA
Archaeologist

DUDEK
853 Lincoln Way, Suite 208
Auburn, CA 95603
Office: 760.479.4252
Cell: 760.846.5755
www.Dudek.com

From: Adam Giacinto
Sent: Monday, August 01, 2016 3:32 PM
To: 'Buffy McQuillen'
Subject: RE: Las Gallinas Valley Sanitary District Secondary Treatment Upgrades- Cultural Outreaach

Great, thanks for responding and for your comments. I'll reach out to the agency for approval to provide the requested information.

Regards,

Adam

Adam Giacinto, M.A., RPA
Archaeologist

DUDEK
853 Lincoln Way, Suite 208
Auburn, CA 95603
Office: 760.479.4252
Cell: 760.846.5755
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From: Buffy McQuillen [mailto:BMcQuillen@gratonrancheria.com]
Sent: Monday, August 01, 2016 3:28 PM
To: Adam Giacinto
Subject: RE: Las Gallinas Valley Sanitary District Secondary Treatment Upgrades- Cultural Outreaach

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Respectfully,
Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
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6400 Redwood Drive, Suite 300
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FAX: 707.566.2291
bmcquillen@gratonrancheria.com

From: Adam Giacinto [mailto:agiacinto@dudek.com]
Sent: Monday, August 01, 2016 1:20 PM
To: Buffy McQuillen <BMcQuillen@gratonrancheria.com>
Subject: Las Gallinas Valley Sanitary District Secondary Treatment Upgrades- Cultural Outreaach

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Please feel free to contact me directly should you have any comments or concerns relating to the proposed project.

Regards,

Adam Giacinto, M.A., RPA
Archaeologist

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853 Lincoln Way, Suite 208
Auburn, CA 95603
Office: 760.479.4252
Cell: 760.846.5755
www.Dudek.com

APPENDIX D

Resumes of Key Personnel

William Burns, RPA

Project Archaeologist

William Burns is an archaeologist with over 10 years' experience in cultural resource management. He is highly knowledgeable about the California Environmental Quality Act, the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, and the National Historic Preservation Act, particularly the Section 106 process. Mr. Burns evaluates buildings and districts for archaeological sensitivity and possible inclusion on the National Register of Historic Places. He assesses project and building plans for archaeological sensitivity and reviews archaeological reports on the state government regulatory end of the process.

Mr. Burns possesses expertise about Pre-contact archaeological sites, paleocoastline reconstruction, and artifact identification and analysis. He applies this expertise to archaeological report writing and editing for Section 106 projects. He also serves on field crews and as a supervisor on archaeological projects, overseeing surveys, site examinations, data recoveries, and artifact database creation and maintenance. For precise site mapping, Mr. Burns uses GPS devices, primarily Trimble GEO XH, ArcGIS, and Maptitude.

EDUCATION

MSc, Coastal and Marine Archaeology, 2010, University of York, Department of Archaeology, York, United Kingdom

BA, Anthropology, Minor in Mathematics, 2004, University of Massachusetts at Amherst, Massachusetts

CERTIFICATIONS

Register of Professional Archaeologists (RPA)

Advanced Diver (National Association of Underwater Instructors)

OSHA HAZWOPER (40-hour)

Basic First Aid/BBP (American Heart Association)

Adult CPR/AED (American Heart Association)

Project Experience

California High-Speed Rail Project, Construction Package 2-3, Fresno to Bakersfield, Dragados / Flatiron Joint Venture, Fresno, Kings, Counties of Tulare and Kern, California. Conducted field survey, organize and manage cultural, tribal, and paleontological monitors, prepared cultural resources survey reports and monthly summaries.

University Village Housing Project, City of Merced, Merced, CA. Conducted field survey, prepared cultural resources report for housing development.

Little Bear Solar Project, First Solar, Inc., Mendota, CA. Conducted field survey, prepared cultural resources report for solar energy development.

Yokohl Ranch Housing Development Project, The Yokohl Ranch Company LLC, Tulare County, CA. Conducted field survey, performed site evaluation for large housing development.

Aera Energy Cultural Resources Inventory, Aera Energy LLC, Kern County, CA. Conducted field survey, performed site evaluation, prepared cultural resources report for inventory existing cultural resources present for planning purposes.

Aera Energy Waterline Installation Project, Aera Energy LLC, Kern County, CA. Conducted field survey, performed site evaluation, prepared cultural resources report for proposed waterline installation.

Granite Construction Clovis Site Development, Granite Development LLC, Clovis, CA. Conducted field survey, prepared cultural resources report for business development.

Little Lake Line B Town Drain System Construction Project, Riverside County Flood Control and Water Conservation District, Riverside County, California. Served as cultural and paleontological monitor.

Parking Structure Project, Academy of Our Lady of Peace, San Diego, California. Provided artifact analysis and report preparation.

Yorba Avenue Warehouse Project, Pacific Industrial Inc., Long Beach, California. Prepared a cultural resources letter report based on a records search and field survey for construction of a warehouse and office facility with parking lots and retention basins.

Proctor Valley Village 14 and Preserve Project, County of San Diego, California. Conducted field survey and site evaluation, prepared cultural resources report, and provided artifact analysis for a component of the Otay Ranch master-planned community.

Vista Canyon Ranch Sewer Line Project, Vista Canyon Ranch LLC, City of Santa Clarita, California. Provided field survey, site evaluation, and artifact analysis for a mixed-use residential and commercial development.

Rancho Cucamonga Northeastern Sphere Annexation Area, Sargeant Town Planning, Rancho Cucamonga, California. Conducted field survey and site evaluation of a potential annexation area.

Southern California Edison Bishop Service Center, Elements Architecture, Inc, City of Bishop, California. Conducted field survey and site evaluation, analyzed artifacts, and prepared report for construction of an electrical line service center facility.

Palm Avenue Distribution Center, IDS Real Estate Group, San Bernardino, California. Conducted field survey and site evaluation, and assisted with preparation of a cultural and paleontological resources monitoring report for warehouse/distribution center construction.

Newhall Homestead South Project, Newhall Land and Farming Company, Los Angeles County, California. Participated in intensive-level field survey of a 2,535 project site for a residential and commercial development.

Five Lagunas, Merlone Geier Management LLC, Laguna Hills, California. Completed a records survey for redevelopment of a mall property.

8777 Washington Boulevard Project, Guild GC (VCN LP), Culver City, California. Conducted a field survey and building evaluation for a commercial building remodel of a two-story, mixed-use building.

San Onofre to Pulgas Double Track, PGH Wong Engineering, San Diego County, California. Analyzed artifacts and prepared report for a railroad construction project.

Relevant Previous Experience

Archaeologist, Duke Cultural Resource Management, Rancho Santa Margarita, California. Participated in archaeological monitoring in Riverside County.

Co-owner and Principal Invesitgator, Archaeological Response Consultants. Prepared and wrote reports for archaeological projects.

Field Director/Crew Chief, Tetratech Inc., Pittsburgh, Pennsylvania. Supervised archaeological field crews (up to 25 people); managed archaeological projects for pipeline/energy projects; coordinated/contacted monitors, landowners, and land agents; and wrote site summaries. Supervised archaeological field crew of 20 on a multi-state gas pipeline survey (Pennsylvania Pipeline Project, Sunoco).

Field Supervisor, Public Archaeology Laboratory, Pawtucket, Rhode Island. Supervised archaeological field crews of up to 20 people. Assessed archaeological sensitivity and prepared archaeological technical reports.

Archaeologist, Public Archaeology Laboratory, Pawtucket, Rhode Island. Performed archaeological field work.

Rhode Island Marine Archaeology Project, Newport Rhode Island. Created an artifact analysis/tracking database.

Archaeological Field Supervisor, University of Massachusetts, Archaeological Services, Amherst, Massachusetts. Performed archaeological field work, mapped and laid in units, and supervised six-member crew. Projects included:

- Turner Falls Airport, Massachusetts—Field worker and lithic analyst for Paleo-Indian camp.
- Cohasset Roundhouse, Massachusetts—Monitored machine excavated nineteenth century railroad roundhouse.
- Tappan Zee Bridge Replacement, Hudson River, New York—Surveyed and mapped nineteenth century coal barge.

Technical Services Division Assistant, Massachusetts Historical Commission, Boston, Massachusetts. Reviewed projects for historic assessment and archaeological sensitivity. Processed archaeological reports and managed report collection. Processed archaeological site forms for State Inventory. Communicated with public and various agencies about Commission policies. General clerical work.

Lab Assistant, Rhode Island Marine Archaeology Project, Newport, Rhode Island. Analyzed and conserved artifacts.

Artifact Curations Assistant/Analyst, Massachusetts Historical Commission, Boston, Massachusetts. Identified and analyzed pre-contact and historic artifacts for the Southwest Corridor and Central Artery Massachusetts Department of Transportation projects in and around Boston. Installed museum exhibits at the Massachusetts Historical Commission Museum.

Vice President and Board Member, The James Cook Foundation, Newport, Rhode Island. Oversee annual meeting. Attend fundraising workshops given by Rhode Island Foundation Seminar. The foundation is dedicated to the preservation of James Cook's shipwrecks in Rhode Island.

Pre-contact Analyst, Historic Artifact Analyst, University of Massachusetts Archaeological Services, Amherst, Massachusetts. Analyzed primarily lithics, aboriginal ceramics, historic bottles and ceramics.

Volunteer, Hadley Historical Society, Hadley, Massachusetts. Identified and recorded Pre-contact artifacts.

Student, University of Massachusetts Archaeological Services, Amherst, Massachusetts. Cleaned historic and Pre-contact artifacts, data entry, photo labeling.

Student, University of Massachusetts Field School & Lab, Amherst, Massachusetts. Participated in Phase II excavation of W.E.B. DuBois boyhood homesite. Cleaned and identified historic artifacts, data entry, photo labeling, site map creation w/ AutoCad, ceramics research.

Volunteer, Rhode Island Marine Archaeology Project, Newport, Rhode Island. Summer/Fall 2003 – Present. As field worker, assisted with mapping and excavation of eighteenth century Revolutionary War British shipwrecks. Contributed to artifact identification and conservation in the lab.

Rhode Island Marine Archaeology Project. As instructor, taught techniques for mapping underwater archaeological sites.

Publications and Conference Presentations

Burns, William and Brad Comeau. 2015. *Negative Cultural Resources Report for the Yorba Avenue Commerce Center, Chino, California.* Dudek and Associates #9105, Encinitas, California.

Comeau, Brad, William Burns, an Micah Hale. 2015. *Cultural Resources Monitoring Report for the SCE Bishop Service Center Project, Inyo County, California*. Dudek and Associates #8392, Encinitas, California.

Comeau, Brad, William Burns, an Micah Hale. 2015. *Cultural Resources Monitoring Report for the Palm Avenue Commerce Center, San Bernardino, California*. Dudek and Associates #8830, Encinitas, California.

Comeau, Brad, William Burns, an Micah Hale. 2015. *Cultural Resources Monitoring Report for the LOSSAN San Onofre to Pulgas Double Track Project, San Diego County, California*. Dudek and Associates #6518, Encinitas, California.

Comeau, Brad, Scott Wolf, Adriane Dorrler, and William Burns. 2015. *Cultural Monitoring and Site Evaluation for the Academy of Our Lady of Peace Parking Lot, San Diego, California*. Dudek and Associates #8407, Encinitas, California.

Wolf, Scott, Brad Comeau, William Burns, and Micha Hale. 2015. *Cultural Resources Report for the Proctor Valley Village 14 & Preserve Project, San Diego County, California.* Dudek and Associates #8447, Encinitas, California.

Burns, W. and H. Hebster. 2014. *Intensive (Locational) Survey of Long Pond Wastewater Treatment Plant, Falmouth, Massachusetts*. Public Archaeology Laboratory Report, Pawtucket, Rhode Island.

Burns, W. and A. Leveillee. 2014. *Site Examination of New London Quartzite Quarry, Warwick, Rhode Island*. Public Archaeology Laboratory Report. Pawtucket, Rhode Island.

Burns, W. and A. Leveillee. 2014. *Intensive (Locational) Survey of Narragansett Longhouse Trail Improvements*. Charlestown, Rhode Island. Public Archaeology Laboratory Report, Pawtucket, Rhode Island.

Burns, W. 2010. "Getting Their Bearings: A Comparative Study of the First Seafarers in Australasia and the Aegean Sea." Master's thesis; University of York, United Kingdom.

Burns, W. 2010. "Quartz Clues: What Lithics Can Reveal About Migration Routes in Scandinavia." Paper presented at the Eighth Annual Mesolithic in Europe Conference, Santander, Spain.

Burns, W., A.E. Lewis, E.L. Bell, and T. Hollis, eds. 2009. "Bibliography of Archaeological Survey and Mitigation Reports: Massachusetts. 2009." 2006-2007 Annual Supplement. Massachusetts Historical Commission, Boston, Massachusetts.

Burns, W., R. Paynter, K. Lynch, B. Comeau, T. Ostrowski, R. Morales, M. Garber, E. Norris, and Q. Lewis. 2005. "The Burghardts of Great Barrington: The View from the W.E.B. DuBois Boyhood Homesite." Paper presented to the Society for Post-Medieval Archaeology and Society for Historical Archaeology Joint Meeting, York, United Kingdom.

Burns, W. 2004. "Newport's Infamous Slaver Wreck." Paper presented at the 44th Annual Northeastern Anthropological Association Conference, Dartmouth College, Hanover, New Hampshire.

Burns, W. 2004. "Investigations of Reputed Slave Ship, The Gem." Bachelor's thesis; University of Massachusetts, Amherst, United States.

Adam Giacinto, MA, RPA

Archaeologist

Adam Giacinto is an archaeologist with more than 9 years' experience preparing cultural resource reports, site records, and managing archaeological survey, evaluation, and data recovery-level investigations. His research interests include prehistoric hunter-gatherer cultures and contemporary conceptions of heritage. His current research focuses on the social, historical, archaeological, and political mechanisms surrounding heritage values. He has gained practical experience in archaeological and ethnographic field methods while conducting research in the Southwest, Mexico, and Eastern Europe.

EDUCATION

San Diego State University
MA, Anthropology, 2011

Santa Rosa Junior College
AA, Anthropology, 2004

Sonoma State University
BA, Anthropology/Linguistics, 2006

PROFESSIONAL AFFILIATIONS

Register of Professional Archaeologists

Society for California Archaeology American Anthropological Association Institute of Archaeomythology

American Anthropological Association

Mr. Giacinto brings specialized experience in cultural resources information processing gained while working at the South Coastal Information Center. He has worked as part of a nonprofit collaboration in designing and managing a large-scale, preservation-oriented, standardized database and conducting site and impact predictive Geographic Information Systems (GIS) analysis of the cultural resources landscape surrounding ancient Lake Cahuilla. He provides experience in ethnographic and applied anthropological methods gained in urban and rural settings, both in the United States and internationally.

Northern California Region

San Pablo Broadband Project, City of San Pablo, California. As Principal cultural investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) sacred lands file search, tribal outreach, and preparation of a constraints study and IS/MND under CEQA regulatory context for the entire City of San Pablo area. A mitigation strategy was prepared to meet City needs within in this area containing numerous sensitive NRHP/CRHR-listed archaeological and built environment resources.

California High Speed Rail, Fresno, California. As Co-Principal Investigator, Mr. Giacinto supervised, implemented, and reported upon cultural inventory and compliance efforts under Section 106 of the NHPA, Federal Rail Authority, CEQA, and local Guidelines for Fresno to Bakersfield section. General responsibilities included day-to day scheduling oversight of Native American monitors, built environment specialists and archaeologists, management of cultural monitoring implementation and site treatment, client reporting, meetings and report preperation. Mr. Giacinto was the lead in multiple trainings.

Royal Gorge Trails Project, Donner Summit, Donner Land Trust, Placer County, California. As Principal archaeological investigator, Mr. Giacinto coordinated and completed a Northwest Central Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American correspondence, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy meeting federal, state, and local standards was developed and provided to the County of Marin for this negative cultural inventory.

Emergency Helipad Project, Tahoe-Truckee Airport District, South Lake Tahoe, Placer County, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Central Center

(NCIC) records search, Native American Heritage Commission (NAHC) and Native American correspondence, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy meeting federal, state, and local standards was developed and provided to the County of Marin for this negative cultural inventory.

MCWRA Interlake Spillway Project, Monterey and San Luis Obispo Counties, California. As Co-Principal archaeological investigator, Mr. Giacinto provided oversight and management of Inventory and Evalutation. Project involved survey of Lake San Antonio and outflow at Lake Nacimiento, as well as evaluation of the Lake San Antonio historic-era dam.

Private Pier Project, City of Tiburon, Marin County, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American correspondence, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy was developed and provided to the County of Marin for this negative cultural inventory.

Water Tank Project, City of Rohnert Park, Sonoma County, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American correspondence, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy was developed and provided to the City of Ronert Park for this negative cultural inventory.

Auburn Recreation District Operations and Development Project, City of Auburn, California. As Principal archaeological investigator, Mr. Giacinto coordinated a North Central Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy was developed meeting Bureau of Reclamation, CEQA, and local requirements for this cultural inventory.

Oakmont Senior Living Facility, City of Novato, Marin County, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American correspondence, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy was developed and provided to the County of Marin for this negative cultural inventory.

Donner Trail Elementary School Project, Truckee, Placer and Nevada County, California. As archaeologist, Mr. Giacinto coordinated a Northwest Central Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American correspondence, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy meeting state and local standards was developed and provided to the County of Marin for this negative cultural inventory.

Tahoe Lake Elementary School Project, South Lake Tahoe, California. As archaeological investigator, Mr. Giacinto assisted with report preperation and project coordination, as well as prepared geoarchaeological assessment for ACOE or project area.

Roberts' Ranch Project, Vacaville, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological and historic architectural survey, and preparation of a technical report under CEQA regulatory context. An appropriate mitigation strategy was developed for this cultural inventory.

Collins Drive Project, City of Auburn, California. As Principal archaeological investigator, Mr. Giacinto coordinated a North Central Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological survey, and preparation of a technical memo . An appropriate mitigation strategy was developed meeting CEQA and local reuirements for this cultural inventory.

Kitchell Santa Rosa Project, Granite Construction, City of Santa Rosa, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwestern Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, and preparation of a technical memo. An appropriate mitigation strategy was developed meeting CEQA and local reuirements for this cultural inventory.

Dorsey Marketplace Project, City of Grass Valley, California. As Principal archaeological investigator, Mr. Giacinto coordinated a North Central Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy was developed meeting CEQA and local reuirements for this cultural inventory, including recommendations relating to historicl mining features.

Penn Valley Project, SimonCre, County of Nevada, California. As Principal archaeological investigator, Mr. Giacinto coordinated a North Central Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological survey, and preparation of a technical memo. An appropriate mitigation strategy was developed meeting Army Corps of Engineers, CEQA and local reuirements for this cultural inventory update.

Byron Airport Development Program, Contra Costa, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological survey, and preparation of a technical report. An appropriate mitigation strategy was developed for this cultural inventory.

Napa Roundabouts Project, City of Napa, California. As Principal archaeological investigator, Mr. Giacinto completed Native American coordination, preperation of an ASR and HRER, review of historical and geoarchaeological documentation, and successfully developed, implemented, and reported upon an XPI Investigation, including preperation of a XPI Proposal and technical report. Mr. Giacinto managed fieldwork, which included survey, the use of mechanical geoprobes and hand excavation with the intent of identifying the potential for both prehistoric and historical-era resouces within the NRHP-eligible West Napa Historic District. A successful mitigation strategy was developed for the City of Napa and Caltrans, within federal, state and local regulatory contexts.

El Dorado Irrigation District Emergency Tree Harvest, El Dorado, California. As Principal archaeological investigator, Mr. Giacinto coordinated a North Central Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological survey, and preparation of a technical report for CalFire and EID under CEQA regulatory context. An appropriate mitigation strategy was developed for this cultural inventory, including updates to the El Dorado Canal.

Combie Road Corridor Improvement Project, Auburn, California. As Principal archaeological investigator, Mr. Giacinto coordinated a North Central Information Center (NCIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological and historic architectural survey, DPR 523 building forms, and preparation of a technical report under CEQA regulatory context. An appropriate mitigation strategy was developed for this cultural inventory.

Dodge Flats Power Project, Pyramid Lake, Nevada. As archaeologist, Mr. Giacinto coordinated a the Nevada Cultural Resource Information System (NCRIS) records search and prepared a study of prehistoric and historical-era constraints for a proposed power project.

Lassen Substation Project, Mt Shasta., California. As Principal archaeological investigator, Mr. Giacinto coordinated and conducted a review of the archaeological and built-enviornment technical study and related sections of the Proponent's Environmental Assessment on behalf of the CPUC.

Meadowrock Vinyard Project, Napa, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American information outreach, archaeological and historic architectural survey, and preparation of a technical report under CEQA regulatory context. An appropriate mitigation strategy was developed for this cultural inventory

Highway 101 Overcrossing Project Offsite Staging Area Project, City of Palo Alto, California. As principal investigator, Mr. Giacinto reviewed existing Historic Property Survey Repoorts and Archaeological Survey Reports; then prepared an addendum study to meet CEQA and Caltrans regulations and styles. He coordinated a records search, NAHC and Native American consultation, archaeological survey, and preparation of the technical report.

Park Boulevard Environmental Impact Report (EIR), City of Palo Alto, California. As Principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, Native American Heritage Commission (NAHC) and Native American consultation, archaeological survey, and preparation of a technical report and EIR section. An appropriate mitigation strategy was developed and provided to the City of Palo Alto for this negative cultural inventory.

Vacaville Center Campus Project, Solano Community College District, City of Vacaville, California. As principal archaeological investigator, Mr. Giacinto coordinated a Northwest Information Center (NWIC) records search, NAHC and Native American communication, archaeological survey, and preparation of a technical report. Recommendations were framed in compliance with CEQA regulations and submitted to the lead agency.

Makani Power Wind Turbine Pilot Program, Google Inc., Alameda, California. As principal investigator, Mr. Giacinto coordinated a NWIC records search, NAHC and Native American consultation, archaeological survey, and preparation of a negative technical memo a for this potential wind farm. The mitigation strategy did not require additional archaeological monitoring or other work based on the lack of archaeological sites, and the low potential for encountering unrecorded subsurface cultural resources. Recommendations were submitted as a categorical exemption to the reviewing agency.

Maidu Bike Path and Park Projects, City of Auburn, California. As principal investigator, Mr. Giacinto managed the survey, archival searches, tribal correspondence, and reported mangement recommendations for a cultural resources inventory. Considerations included compliance under CEQA and Section 106 of the NHPA.

Steephollow Creek and Bear River Restoration, Nevada County, California. As Principal investigator, Mr. Giacinto assisted with management of field efforts and preperation of a technical report for a cultural inventory. Resources were evaluated for significance under CEQA, and Section 106 of the NHPA.

Yokohl Ranch Development Project, The Yokohl Ranch Company, LLC, Tulare County, California. As co-principal investigator and field director, Mr. Giacinto managed 15 archaeologists in conducting significance evaluation of 118 historical and prehistoric cultural resources throughout the 12,000 acre Yokohl Valley area. Operated as tribal interface, and facilitated the respectul handling and reburial of sensitive cultural material with the tribes, applicant, and NAHC.

Yokohl Ranch Cultural Resources, The Yokohl Ranch Company, LLC, Tulare, California. As Principal investigator and field director, Mr. Giacinto managed 15 archaeologists in conducting 1,900 acres of survey throughout the Yokohl Valley.

Hamilton Hospital Project, City of Novato, California. As principal investigator, Mr. Giacinto managed tribal and archaeological fieldwork and methodological reporting relating to the extended Phase I inventory geoprobe drilling and shovel test pit excavation. Considerations included compliance under CEQA and local regulations.

Southern California Region

Development

1836 Columbia Street Project, Parikh Properties, City of San Diego, California. As Co-Principal investigator, Mr. Giacinto coordinated a SCIC records search, NAHC, archaeological survey, and preparation of a negative technical report for this small residential development. The mitigation strategy did not require additional archaeological monitoring or other work based on the lack of archaeological sites, and the low potential for encountering unrecorded subsurface cultural resources. Recommendations were submitted to the City of San Diego.

Canergy - Rutherford Road Development Project, Ericsson-Grant, Inc., El Centro, California. As Principal investigator, Mr. Giacinto coordinated records searches, Native American contact, map preparation and fieldwork.

Oro Verde Development Project, Wohlford Land Co., LLC, Valley Center, California. As Principal investigator, Mr. Giacinto coordinated a SCIC records search, NAHC and Native American consultation, archaeological survey, and preparation of a negative technical letter report for this small residential development. The mitigation strategy did not require additional archaeological monitoring or other work based on the lack of archaeological sites, and the low potential for encountering unrecorded subsurface cultural resources. Recommendations were submitted to the County of San Diego.

Fifth Avenue Development Cultural Inventory, E2 ManageTech, Inc., Chula Vista, California. As Principal investigator, Mr. Giacinto coordinated the preparation of a paleontological, archaeological, and historic resource inventory for a proposed residential project. Responsibilities included a SCIC records search, San Diego Natural History Museum (SDNHM) records search, archival research, agency and client communication, GIS, and compiling the technical report and appendices. Results were submitted as a technical report s to the City of Chula Vista.

Normal Street Evaluations, Darco Engineering, Inc., San Diego, California. As Principal investigator, Mr. Giacinto managed the preparation of a historic resource evaluation for a number of buildings located in the community of University Heights. Responsibilities included an SCIC records search, agency and client communication, archival research, GIS, and compiling the technical report and appendices. Results were submitted as a technical report and associated appendices to the City of San Diego.

Mapleton Park Centre Site Analysis, Kaiser Foundation Health Plan, Inc., Murrieta, California. As Principal archaeological consultant, Mr. Giacinto prepared a project constraints study for Kaiser Permanente, within the County of Riverside.

New Kaiser Permanente Medical Center EIR, Kaiser Foundation Health Plan, Inc., San Diego, California. As field director, Mr. Giacinto conducted a survey of the proposed medical center and reported negative findings to the City of San Diego.

St. John Garabed Church Environmental Services, St. John Garabed Armenian Apostolic Church Trust, San Diego, California. As field director and co-principal investigator, Mr. Giacinto conducted a survey of the proposed church facilities and reported findings to the City of San Diego. Additional responsibilities included preparation of the cultural and paleontological sections for the project EIR.

PMC Quarry Creek Project Phase II Cultural Evaluation, McMillin Land Development, Carlsbad, California. As field director, Mr. Giacinto managed and conducted archaeological testing, data analysis, report writing and mapping of existing cultural resources within the 60-acre Quarry Creek Project study area.

University Office and Medical Park Project Cultural Resource Study Survey, U.S. Army Corps of Engineers, San Marcos, California. As field director, Mr. Giacinto managed a team of archaeologists in conducting survey of the 49.5-acre study area in a general inventory of potentially impacted cultural resources and prepared maps and a report for the presentation of this information.

Education

Mission Beach Elementary School EIR, McKellar McGowan, San Diego, California. As principal archaeological investigator, Mr. Giacinto coordinated a Southern California Information Center (SCIC) records search, NAHC and Native American consultation, archaeological survey, and preparation of a technical report. The mitigation strategy did not require archaeological monitoring or other work based on the lack of archaeological sites, and the low potential for encountering unrecorded subsurface cultural resources. Recommendations were submitted to the City of San Diego.

San Diego State University (SDSU) West Campus Housing EIR/Tech Studies, Gatzke, Dillon and Balance, San Diego, California. As principal archaeological investigator, Mr. Giacinto coordinated a SCIC records search, NAHC and Native American consultation, archaeological survey, and preparation of a technical report and EIR section. An appropriate mitigation strategy was developed and provided to SDSU for this negative cultural inventory.

Orange Coast College Initial Study (IS), Coast Community College District, Orange, California. As principal archaeological investigator, Mr. Giacinto coordinated records search, NAHC and Native American consultation, archaeological survey, preparation of a technical report, and provided management and compliance recommendations relating to cultural resources on three Orange County College campuses.

Energy

McCoy Solar Energy Project, Blythe, California. As Principal Investigator, Mr. Giacinto supervised, implemented, and reported upon compliance efforts under Section 106 of the NHPA, BLM Guidelines, CEQA, and County of Riverside Guidelines. General responsibilities included day-to day scheduling oversight of Native American monitors and archaeologists, tribal interface, management of cultural monitoring implementation, and agency reporting. Worked with the Dudek Compliance team to provide cultural summaries for 14 variance requests. Reporting included preperation and submittal of daily cultural resource summaries to interested tribal parties and the BLM, monthly summaries of cultural compliance status and treatment of unanticipated finds, bi-weekly BLM-McCoy Solar, meetings and a montitoring summary report. Mr. Giacinto was the lead in two formal trainings with monitors and counsel members from the Colorado River Indian Tribes regarding federal and state regulations relating to human remains, County and BLM guiding documents, identification of cultural material, and the multiple understandings of "cultural resources".

Blythe Solar Power Project, Blythe, California. As Principal Investigator, Mr. Giacinto supervised, implemented, and reported upon cultural compliace and construction monitoring efforts under Section 106 of the NHPA, BLM Guidelines, California Energy Commission Guidelines, CEQA, and County of Riverside Guidelines. General responsibilities included day-to day scheduling oversight of Native American monitors and archaeologists, tribal interface, management of cultural monitoring implementation, and agency reporting to both the BLM and Energy Commission. Reporting included preperation and submittal of daily cultural resource summaries to interested tribal parties, Energy Commission, and the BLM, monthly summaries of cultural compliance status and treatment of unanticipated finds, bi-weekly BLM-McCoy Solar, meetings and a montitoring summary report. Mr. Giacinto was the lead in multiple trainings.

BayWa Granger Solar Site Survey, RBF Consulting, Valley Center, California. As Principal Investigator, Mr. Giacinto managed the inventory and prepared management recommendations for a proposed solar farm in Valley Center, California. A relationship of open dialogue between Mr. Giacinto and the client allowed for the project design to avoid significant direct and indirect impacts to cultural resources the proper the development of compliant mitigation and informed project design. Results were submitted to the County of San Diego Department of Planning and Landuse.

Valley Center Solar Site Survey, RBF Consulting, Valley Center, California. As Principal Investigator, Mr. Giacinto managed the inventory and prepared management recommendations for a proposed solar farm in Valley Center, California. A relationship of open dialogue between Mr. Giacinto and the client allowed for the project design to avoid significant direct and indirect impacts to cultural resources the proper the development of compliant mitigation and informed project design. Results were submitted to the County of San Diego Department of Planning and Landuse.

Data Collection for the Tierra Del Sol Solar Farm Project, Tierra Del Sol Solar Farm LLC, Tierra Del Sol, California. As field director, Mr. Giacinto managed a crew of 8 archaeologists in conducting the survey, surface mapping, surface collection, and excavation of 13 prehistoric and historical period sites throughout the McCain Valley. Mr Giacinto prepared a invenetory and evaluation report for this project, completed to County of San Diego Standards.

Rugged Solar Farm Project, Rugged Solar LLC, Boulevard, California. As principal investigator and field director, Mr. Giacinto managed a crew of 12 archaeologists in conducting the survey, surface mapping, surface collection and excavation of 42 prehistoric and historical period sites throughout the McCain Valley. Mr Giacinto prepared an inventory and evaluation report and EIR section for this project, completed to County of San Diego Standards

Wind Energy Project, Confidential Client, Riverside, California. As principal cultural investigator, Mr. Giacinto prepared the cultural scope and schedule, coordinated the records search, NAHC and Native American consultation, archaeological survey, and preparation of a technical report for the County of Riverside that provided management and compliance recommendations relating to identified cultural resources. Additional responsibilities included coordination of paleontological and Native American monitor subconsultants.

Gas Line for Poway Pump Station, City of Poway, San Diego County California. As principal investigator, Mr. Giacinto conducted an inventory, coordinated survey, and provided amangement recommendations in technical report.

Sol Orchard Solar Farm, RBF Consulting, Ramona, California. As Principal Investigator, Mr. Giacinto coordinated archaeological and Native American monitoring and prepared management recommendations for a proposed solar farm in Ramona, California. All impacts to significant cultural resources in the vicinity were avoided. Results were submitted to the County of San Diego.

Solar Farm Cultural Resources Services, Confidential Client, San Diego, California. As project director, Mr. Giacinto managed a crew of 8 archaeologists in conducting the survey, surface mapping, surface collection, and excavation of 13 prehistoric and historical period sites throughout the McCain Valley.

As-Needed Environmental Analysis for Solar Project Road Access, Confidential Client, San Diego, California. As field director, Mr. Giacinto managed a crew of 12 archaeologists in conducting the survey, surface mapping, surface collection and excavation of 42 prehistoric and historical period sites throughout the McCain Valley.

East County Substation EIR/Environmental Impact Statement (EIS), California Public Utilities Commission (CPUC), San Diego County, California. As field archaeologist, Mr. Giacinto worked as part of a team to survey the possible impacts to exiting and newly recorded cultural resources.

Class III Cultural Resources Inventory for Meteorological Masts 1 and 4 and Access Roads, Iberdrola Renewables, Kern County, California. As field director, Mr. Giacinto managed a team of archaeologists in conducting surveys of the study area in a general inventory of potentially impacted cultural resources.

Wood to Steel Pole Conversion Survey, San Diego Gas and Electric (SDG&E), San Diego County, California. As crew chief, Mr. Giacinto managed a team of archaeologists in conducting a survey of Circuit 75 in a general inventory of potentially impacted cultural resources.

Sunrise Powerlink Project Monitoring, SDG&E, Imperial and San Diego Counties, California. As a field director, Mr. Giacinto assisted in managing an archaeological field crew, aided in data collection, and conducted monitoring by facilitating planned mitigation strategies of construction and pre-construction activities associated with a 500-kilovolt (kV) transmission line, access roads, and work areas.

Cal Valley Solar Ranch-Switchyard Site No. 3 Archaeological Testing, Ecology & Environment Inc., San Luis Obispo County, California. As part of a team of archaeologists, conducted excavations and general testing of a middle prehistoric site.

Wood to Steel Pole Conversion, SDG&E, Cleveland National Forest (CNF), San Diego County, California. As crew chief, Mr. Giacinto managed a team of archaeologists in conducting a survey of Circuit 440 in a general inventory of potentially impacted cultural resources.

Devers to Palo Verde 2 (DPV2) Colorado River Substation Project Monitoring, Southern California Edison (SCE), Blythe, California. As project archaeologist, Mr. Giacinto monitored the geotechnical testing of soils along access road leading into Colorado River Substation from the west.

Sunrise Powerlink Pole Fielding and Environmental Monitoring, SDG&E, Imperial and San Diego Counties, California. As the archaeological representative, Mr. Giacinto worked with SDG&E-contracted engineers, surveyors, and biologists to assess proposed work areas, access roads, and structure locations for possible impacts upon existing cultural resources.

Wood to Steel Pole Conversion Pole Fielding, SDG&E and CNF, San Diego County, California. As the archaeological representative, Mr. Giacinto worked with SDGE-contracted engineers, surveyors, and biologists to assess proposed pole transmission pole locations for possible impacts upon existing cultural resources.

Wood to Steel Pole Conversion, SDG&E and CNF, San Diego County, California. As field archaeologist, Mr. Giacinto worked as part of a team to survey segments of Circuit 449, Circuit 78, TL 625, and TL 629 for possible impacts to existing cultural resources.

Guy Pole and Stub Pole Removal Monitoring, SDG&E, Carlsbad, California. As archaeological representative, Mr. Giacinto monitored activities associated with the removal of existing unused energy transmission infrastructure in an area near recorded cultural resources of noted significance.

DPV2 500 kV Transmission Line Survey, SCE, Riverside County, California. As field archaeologist, Mr. Giacinto worked as part of a team to survey more than 45 miles of linear proposed project area. Conducted an intensive inventory of prehistoric and historical period cultural resources from Desert Center to Thousand Palms.

DPV2 Colorado Switchyard Survey, SCE, Riverside County, California. As project archaeologist, Mr. Giacinto prepared the site records gathered through a pre-field records search and created project area maps in GIS illustrating the location and type of preexisting cultural resources prior field survey for a fiber-optic ground wire project for DPV2 Colorado switchyard in Blythe.

Pole Replacement Projects Surveying, SCE, Orange and Riverside Counties, California. As project archaeologist, Mr. Giacinto prepared the site records gathered through a pre-field records search and created project area maps in GIS illustrating the location and type of preexisting cultural resources prior to fieldwork for the deteriorated pole project within the CNF, and deteriorated pole and pole replacement on private property.

Sunrise Powerlink Environmentally Superior Southern Alternative Survey, SDG&E, San Diego and Imperial Counties, California. As project archaeologist, Mr. Giacinto assisted in preparing the site records gathered through a pre-field records search and digitized the boundaries if archaeological sites in GIS illustrating the location and type of preexisting cultural resources, and a records search of existing site data for alternative route.

Military

Cultural Resources Inventory, March Joint Powers Authority, Riverside County, California. As Principal investigator, Mr. Giacinto managed the field efforts, reporting, and facilitated tribal consultation for cultural inventory. The report included prepration of a cultural context for WW-I and WW-II era history o fthe air fields and camp in the vicinity. Resource considerations were compliant with CEQA and Section 106 of the NHPA.

Utility Corridor Survey at Edwards Air Force Base, U.S. Air Force, California. As Archaeologist, Mr. Giacinto guided the design and preperatio of digital field forms to assisst in the recordation of archaeological resources at archaeological sites throughout the EAFB, including the Pancho Barnes site.

Infill Survey Project at Edwards Air Force Base, U.S. Air Force, California. As Field Director, Mr. Giacinto managed a team of five archaeologists in conducting a general pedestrian inventory of cultural resources within a 7,650-acre study area

Desert Warfare Training Facility Cultural Resources Inventory Project, U.S. Navy Southwest, Imperial County, California. As field archaeologist, Mr. Giacinto worked as part of a team to conduct an intensive inventory of prehistoric and historical period cultural resources in selected areas within the Chocolate Mountains Gunnery Range in Niland.

Morgan/Bircham 55 to 12 kV Project Survey, U.S. Navy-Naval Air Weapons Station (NAWS)-China Lake, Inyo County, California. As project archaeologist, Mr. Giacinto prepared the site records gathered through a pre-field records search and created project area maps in GIS illustrating the location and type of preexisting cultural resources prior to field survey at NAWS China Lake.

Resource Management

Pure Water Project Constraints Study and PEIR, City of San Diego, California. As Principal investigator and field director, Mr. Giacinto managed preperation of a constraints study for the Pure Water Project. Work involved a records search of over 100 mile linear miles of San Diego. Site record information from more than 1,236 cultural resources was processed, coded, and integrated within a geospatial sensitivity model to identy archaeological and built environment constraints throughout the proposed alignment. This information was integrated within a PEIR and is currently being used to assist with management planning through the project alignment. Maps were then generated using generalized grid units (1000 x 1000 meters in size) to provide a visual model of relative archaeological resource sensitivity while maintaining the appropriate level of confidentiality for public dissemination to assist in planning.

Lake Morena Dam Project, Lake Morena, City of San Diego, California. As Principal investigator, Mr. Giacinto managed a SCIC records search, NAHC and Native American correspondence, archaeological survey, agency correspondence, and preparation of a archaeological and built environment technical report work related to dam improvements.

Hanson El Monte Pond Restoration, Lakeside's River Park Conservancy, San Diego, California. As Principal investigator, Mr. Giacinto managed the field efforts, reporting, and agency interface for a cultural inventory. Resources were evaluated for significance under county guidelines, CEQA, and Section 106 of the NHPA. Worked with the Army Corps for submittal of documents to SHPO.

Peter's Canyon Regional Park CEQA Study, Orange County Fire Authority, Orange, California. As principal investigator, Mr. Giacinto conducted a cultural resources inventory of all cultural resources within Peters Canyon planned fuel reduction areas. Mr. Giacinto coordinated a SCIC records search, NAHC and Native American consultation, archaeological survey, and preparation of a technical report. Recommendations were provided to agency personnel to assist in mitigating any possible adverse effects to cultural resources in the project vicinity.

Lake Cahuilla Cultural Resources Management Plan, ASM PARC, Riverside County, California. As project archaeologist and lead analyst, Mr. Giacinto developed a standardized database associated with ancient Lake Cahuilla and the surrounding archaeological and ecological landscape. Performed GIS data integration and predictive analysis, data entry of site record information, and completed multi-day, multi-person record search covering 17 USGS quadrangle in Riverside County. The project was finalized with the prepreation of a management document submitted to the the Friends of the San Jacinto Mountains with the intent of identifying known and potential areas for preservation.

Third Party Review and Monitoring

Ocotillo Wind Energy Facility Third Party Compliance Monitoring, Bureau of Land Management (BLM), Imperial County, California. As third party observer, Mr. Giacinto collaborated with the BLM in maintaining cultural compliance with federal environmental policies. In addition, processed archaeological and Native American comments for BLM attention.

Rio Mesa Solar Electric Generating Facility CEQA Studies, BrightSource Energy, Inc., Riverside, California. As third party reviewer, Mr. Giacinto collaborated with the BLM, the California Energy Commission, and Brightsource to review URS Corporation's cultural report content, quality, and environmental compliance.

Tribal

South Palm Canyon West Fork Flood Emergency Work, Agua Caliente Band of Cahuilla Indians, Palm Springs, California. As principal investigator, Mr. Giacinto worked with the Agua Caliente Band of Cahuilla Indians Tribal Historic Preservation Office to conduct archaeological monitoring on tribal lands of emergency repairs within Andreas Canyon National Register of Historic Places listed district. A monitoring report with a summary of findings and implemented mitigation activities, daily monitoring logs and photos, and confidential figures was provided to the tribe.

South Palm Canyon Improvements, Agua Caliente Band of Cahuilla Indians, Palm Springs, California. As principal investigator, Mr. Giacinto worked with the Agua Caliente Band of Cahuilla Indians Tribal Historic Preservation Office to conduct archaeological monitoring on tribal lands of facility improvements within Andreas Canyon National Register of Historic Places listed district. A monitoring report with a summary of findings and implemented mitigation activities, daily monitoring logs and photos, and confidential figures was provided to the tribe.

Shu'luuk Wind Project Cultural Resource Study Survey, Campo Environmental Protection Agency and Invenergy LLC, Campo Indian Reservation, California. As field director, Mr. Giacinto managed two teams of archaeologists, consisting of seven total practitioners, in conducting a survey of the 2,400-acre study area in a general inventory of potentially impacted cultural resources. Worked with Campo Environmental Protection Agency, of the Campo Kumeyaay Nation, in forming management objectives and integrating six Native American Monitors into daily survey activities.

Water/Wastewater

Auburn Recycled Wastewater Treatment Plant Secondary Process Upgrade Improvement Project, City of Auburn, California. As principal investigator, Mr. Giacinto managed the survey, archival searches, tribal correspondence, and reported mangement recommendations for a cultural resources inventory. Considerations included compliance under CEQA and Section 106 of the NHPA.

Recycled Water Pipeline Project, City of Woodland, California. As principal investigator, Mr. Giacinto managed the survey, archival searches, tribal correspondence, and reported mangement recommendations for a cultural resources inventory. Considerations included compliance under CEQA and Section 106 of the NHPA.

Carlsbad Desalination Third Addendum to EIR Biological Survey and Monitoring, Poseidon Water LLC, Carlsbad, California. As archaeological consultant, Mr. Giacinto conducted archaeological monitoring and consultation on an as-needed basis.

Old Mission Dam, City of San Diego, California. As principal investigator, Mr. Giacinto conducted an inventory, coordinated survey, and prepared recommendations for the maintenance of the National Register of Historic Places listed resource, Old Mission Dam.

Otay River Wetland Mitigation, Poseidon Water LLC, San Diego, California. As field director, Mr. Giacinto conducted a cultural resources survey of a mitigation property, managed by the U.S. Fish and Wildlife Service (USFWS), to be used for estuary restoration.

Vallecitos Water District Rock Springs Sewer, Infrastructure Engineering Corporation, San Diego, California. As principal investigator, Mr. Giacinto coordinated a SCIC records search, NAHC and Native American consultation, archaeological survey, and preparation of a negative technical letter report for this small residential development. The mitigation strategy did require additional archaeological monitoring based on the potential to encounter subsurface cultural resources. Recommendations were submitted to the Vallecitos Water District.

Relevant Previous Experience

Guest Lecturer in Cultural Resources for Upper Division CEQA Course, University of San Diego, California. As Cultural Resources Lecturer, Mr. Giacinto was invited to present on Cultural Resources history and management under CEQA for an upper devision USD course in April, 2015.. A presentation was created with the intention of poviding a contextual and technical understanding of how culturl aresources are interpreded and evaluatued under CEQA. The implications relating to the Friends of

Mamoth (1972) decision and other cases were outlined in detail. AB-52 considerations and timing were summarized, and implications of Tribal Cultural Resources as a class of resource discussed.

Investigation of Emergent Trends of San Diego Cultural Resource Management, San Diego County, California. As ethnographic researcher, conducted verbal, semi-structured interviews with 17 archaeologists, policy makers, and Native American monitors and curators regarding the history and current practice of Cultural Resource Management. Information was contextualized through extensive background research using legal, academic, specialized, and archival sources. Analysis employed a synthesis of cultural anthropological and archaeological theory and practice. Results were published as *M.A. thesis in Anthropology* at San Diego State University (2012).

Needs Assessment/Diagnostic for the Community of La Sierra de San Francisco, Baja California Sur, Mexico. As ethnographic researcher, worked for San Diego State University through a grant provided by the International Community Foundation to conduct a general needs assessment in a UNESCO protected community within a UNESCO defined region of World Heritage, la Sierra de San Francisco. Resolved to help with improving the infrastructure of potable water, assisting in the construction of a system of telecommunications for education, and conducting workshops aimed at the preservation of local prehistoric and historical cultural and archaeological resources (2009-2011).

Ethnographic Field School, Zimatlan, Oaxaca, Mexico. As ethnographic student/researcher for San Diego State University, lived with local family and conducted interviews with local population regarding microcredit, sustainable/traditional agriculture and husbandry. Additionally, compiled audio/visual digital stories with local youth and conducted training in research and appropriate documentation. Emphasis was placed on dietary and generational cultural changes (2008).

Research Assistant, San Diego State University Collections Management. As graduate student at SDSU, worked in Collections Management under the instruction of Dr. Lynn Gamble (2007). Responsibilities included laboratory analyses, data entry, record processing, and collections curation management.

Research Assistant, South Coastal Information Center, San Diego State University. As graduate student at SDSU, worked at SCIC under the instruction of Dr. Seth mallios (2008). Responsibilities included site record and report processing and resource mapping.

Archaeological Field School, San Diego State University. As graduate student at SDSU, attended an archaeological fieldschool at Cuyamaca Complex Type Site under the instruction of Dr. Lynn Gamble (2007).

Archaeological Researcher, Institute of Archaeomythology. As as researcher and photographer, attended lectures and assissted with symposiums in Bulgaria, Serbia and Romania (2004,2008)

Archaeological Field School, Sonoma State University. As undergraduate student at SSU, attended an archaeological fieldschool under the instruction of Dr. Adrian Praetzellis (2005).

Publications

Emergent Trends of Cultural Resource Management: Alternative Conceptions of Past, Present and Place. M.A. thesis in Anthropology, San Diego State University. 2012.

A Qualitative History of "Cultural Resource" Management. anthropologiesproject.org. May 15, 2011.

Lake Cahuilla Cultural Resources Management Plan. ASM PARC. April, 2011.

A Qualitative Investigation of "Cultural Resource" Management In San Diego. The Society for the Anthropology of North America. April 2010.

A Qualitative History of "Cultural Resource" Management. ethnographix.org. May 15, 2010.

Conway, F., R. Espinoza, and A. Giacinto. 2010 Results of Needs Assessment Conducted with Communities of La Sierra de San Francisco, 2009-2010. Submitted to the International Community Foundation.

Selected Technical Reports

Giacinto, A. and A. Pham 2015. *Phase I Archaeological Inventory Report for the El Toro Recycled Water Project, Orange County, California.* Prepared for the El Toro Water District and submitted to the City of Laguna Niguel.

Giacinto, A. 2015. *Negative Cultural Resources Inventory for the Vacaville Center Campus Project, City of Vacaville, California.* Prepared for and submitted to the Solano Community College District

Giacinto, A. 2015. *Archaeological, Built-Environment, and Paleontological Resources Inventory for the 8777 Washington Blvd. Culver City Project, Los Angeles County, California.* Submitted to the City of Culver.

Giacinto, A. 2015. *Phase I Archaeological Inventory Report for the Santa Margarita Recycled Water Project, Orange County, California.* Prepared for the Santa Margarita Water District and submitted to the City of Laguna Niguel.

Wolf S. and A. Gicinto 2015. *Cultural Resources Survey for the Otay Village IV Project, San Diego County, California.* Submitted to the County of San Diego.

Wolf S. and A. Gicinto 2015. *Cultural Resources Survey for the BayWa Granger Solar Project, San Diego County, California.* Submitted to the County of San Diego.

Wolf S. and A. Gicinto 2015. *Cultural Resources Survey for the Covert Canyon Project, San Diego County, California.* Prepared for Michael Baker International. Submitted to the NPS - Cleveland National Forrest.

Giacinto, A. 2015. *Phase I Archaeological Inventory Report for the San Juan Creek Outfall Project, Dana Point, California.* Prepared for and submitted to the South Oarnge County Water Authority.

Giacinto, A. and N. Hanten 2015. *Wastewater Treatment Plant Secondary Process Upgrade Improvement Project, City of Auburn, Placer County, California.* Prepared for and submitted to the City of Auburn.

Giacinto, A. 2014. *Data Recovery for CA-RIV-3419 (Locus-14), A Multi-Component Site located within the McCoy Solar Energy Project Right of Way.* Submitted to the Bureau of Land Management.

Giacinto, A. 2014. *Work Plan to Complete Mitigation Requirement for CA-RIV-3419, A Multi-Component Site located within the McCoy Solar Energy Project (MSEP) Right of Way.* Submitted to the Bureau of Land Management.

Giacinto, A. 2014. *Summary of Data Recovery for CA-RIV-10225, A World War II site located within the McCoy Solar Energy Project (MSEP) Right-of-Way.* Submitted to the Bureau of Land Management.

Giacinto, A. 2014. *Phase I Archaeological Inventory Report for the Mission Beach Residences Project, San Diego County, California. Prepared for McKellar-Ashbrook LLC.* Submitted to the City of San Diego Development Services Department.

Giacinto, A. 2014. *Negative Cultural Resources Inventory for the Coast Hwy 101 Pump Station Project, City of Encinitas, California*. Prepared for and submitted to the City of Encinitas.

Giacinto, A. 2014. *Phase I Archaeological Inventory Report for the Santa Barbara Place Residences Project, San Diego County, California. Prepared for McKellar-Ashbrook LLC.* Submitted to the City of San Diego Development Services Department.

Giacinto, A. 2014. *Negative Cultural Resources Phase I Survey Report for the Oro Verde Project, San Diego County, California*. Submitted to County of San Diego Department of Planning and Landuse.

Giacinto, A. 2014. *Cultural Resources Technical Report for the West Campus Student Housing Complex Project, San Diego County, California.* Submitted to County of San Diego Department of Planning and Landuse.

Hale, M. and A. Giacinto 2014. *Negative Cultural Resources Phase I Inventory for the Canergy Project, Brawley, Imperial County, California.* Prepared for Ericsson-Grant Inc. Submitted to Imperial County Planning and Development.

Castells, J. and A. Giacinto 2014. Historic Resources Inventory for the Normal Street Project, City of San Diego, California. Submitted to City of San Diego..

Giacinto, A. 2013. *Phase I Cultural Resources Assessment Report for the Smoke Tree Wind Project, Riverside County, California*. Prepared for Ogin, Inc. Submitted to County of Riverside Planning Department.

Castells, J. and A. Giacinto 2013. *Archaeological, Historical, and Paleontological Resources Inventory for the 5th Avenue Chula Vista Development Project, City of Chula Vista, California.* Prepared for E2 ManageTech, Inc. Submitted to City of Chula Vista.

Giacinto, A. 2013. *Archaeological Monitoring Summary Memo for the South Palm Canyon Improvements Project, Agua Caliente Band of Mission Indians Reservation, California.*

Giacinto, A. 2013. Cultural Resources *Phase I Survey Report for the NorthLight Power Valley Center Solar Power Project, San Diego County, California.* Prepared for RBF Environmental. Submitted to County of San Diego Department of Planning and Landuse.

Giacinto, A. and M. Hale 2013. *Phase I Cultural Resources Assessment Report for the WCSS0011R1 and WCS00012R1 Project, Riverside County, California*. Prepared for FloDesign Wind Turbine Corp. Submitted to County of Riverside Planning Department.

Giacinto, A., and M. Hale. 2013. *Cultural Resources and Paleontological Survey Report for the St. John Garabed Church Project, San Diego County, California.* Submitted to the City of San Diego, California.

Giacinto, A. 2013. *Cultural Resources Phase I Addendum Report for the Old Mission Dam Maintenance Project, San Diego County, California.* Prepared for the City of San Diego.

Giacinto, A. 2013. *Archaeological Reconnaissance for Categorical CEQA Exemption for the Makani/Google Airborne Wind Turbine Pilot Project, Alameda County, California.*

Giacinto, A. 2013. *Negative Findings Letter Report for a Phase I Cultural Resources Study Conducted for the VWD Rock Springs Project, San Diego County, CA.* Submitted on behalf of IEC Corporation to the Vallecitos Water District.

Hale, M., A. Giacinto, and N. Hanten, edt. 2013. *Cultural Resources Inventory and Evaluation for the Yokohl Ranch Project, Tulare County, California.* Contributions by S. Hector, A. Garcia-Herbst, L.. Akyüz, M. Becker, S. Ní Ghabhláin, and S. Stringer-Bowsher

Hale, M., and A. Giacinto 2013. *Yokohl Ranch Project EIR, Chapter 4.6, Yokohl Valley, Tulare County, California*

Giacinto, A., and M. Hale 2012. *Cultural Resources Survey Report for the St. John Garabed Church Project, San Diego County, California*

A. Giacinto and M. Hale, 2012. *Cultural Resources Inventory for the U.S. Fish and Wildlife Service Otay River Estuary Restoration Project, Otay Mesa, San Diego County, California*

Giacinto, A. 2012. Negative *Cultural Resources Survey Report for the Kaiser Permanente San Diego Central Medical Center, San Diego County, California*

Hale, M., and A. Giacinto 2012. *Cultural Resources Inventory for the Orange County Fire Authority Project, Peters Canyon, Orange County, California*

Hale, M., and A. Giacinto 2012. *North Embarcadero Port Master Plan Amendment (NE-PMPA) EIR, Chapter 4.9, Port of San Diego, San Diego, California.*

Hale, M., and A. Giacinto 2012. *Rio Mesa Solar EIS, Chapter 4.6, Brightsource, Riverside County, California.*

Giacinto, A., J. Daniels,, I. Scharlotta, ,M.J. Hale 2012. *Archaeological Evaluation for the Rugged Solar Project.* San Diego County, California.

Giacinto, A., J.T. Daniels, M.J. Hale, 2012. *Archaeological Evaluation for the Tierra Del Sol Project.* San Diego County, California.

Hale, M., S. Andrews, M. Dalope, A. Giacinto, and N. Hanten 2012. *Phase I Cultural Resources Inventory of 7,650 acres in Management Areas 1B, 3D, and 3E Edwards Air Force Base, Kern County, California*. Prepared for Richard Bark, JT3 LLC, Subcontract Number 1A10000101.

Hale, M., A. Giacinto, and J. Schaefer 2012. *Class III Cultural Resources Inventory for the Campo Invenergy Project, Campo Indian Reservation, San Diego California*.

Giacinto, A., and M. Becker 2012. *Padre Dam Eastern Service Area Secondary Connection-Alternative Site Location*. Letter Report. San Diego County, California.

Giacinto, A., and J. Cook 2011. *Cultural Resource Study for the UOMP Project*. Letter Report.San Diego County, California.

Ghabhláin, S., A. Giacinto, and T. Quach 2011. *Cultural Resources Evaluation for the Quarry Creek Project*. City of Carlsbad,California.

DeCarlo, M.M., A. Giacinto, and W.T. Eckhardt 2010. Cultural Resources Inventory for the *Proposed Colorado River Substation Expansion Project*. Riverside County, California.

Cook, J.R., A. Garcia-Herbst, A. Giacinto, and M. Dalope 2010. *Addendum to HDR|e²M Final Report: Prehistoric Artifact Scatters, Bedrock Milling Stations and Tin Can Dumps: Results of a Cultural Resources Study for the SDG&E East County Substation Project*. San Diego County, California.

Presentations

Shifting Concepts of "Cultural Reousource" in CRM. Presented by Adam Giacinto during Renewable Energy Symposium for Society for California Archaeology Conference. Ontario, CA. 2016.

Shifting Concepts of Non-Significant Cultural Resources. Presented by Giacinto, Comeau, and Hale for Zzyzx Conference. Zzyzx, CA. 2015.

Managing California's Cultural Resources on Public Lands: A Third Party Consultant Perspective. Presented Hale and Giacinto for Society for California Archaeology, San Diego, 2015.

Invited Guest Lecture on Cultural Resources in CEQA. University of San Diego, CA. 2015.

A GIS Analysis of Ancient Lake Cahuilla Archaeological Sites, Riverside County, CA, United States. For Society for California Archaeology, San Diego, 2012.

Emergent Trends of San Diego Cultural Resource Management. For Society for California Archaeology, San Diego, 2012.

A GIS Analysis of Ancient Lake Cahuilla Archaeological Sites, Riverside County, CA, United States. For Balancias y Perspectivas, National Institute of Archaeology and History (NIAH), Mexicali, MX, 2011.

Micah Hale, PhD, RPA

Senior Archaeologist

Micah Hale is Dudek's cultural resources practice manager and lead principal investigator with 18 years' technical expertise with in-ground penetrating radar, and as a lithic and groundstone analyst and invertebrate analyst. Dr. Hale has served as a principal investigator in the public and private sector for all levels of archaeological investigation, as a public outreach coordinator and as an assistant professor at the University of California, Davis. Dr. Hale functions as a principal investigator in project oversight including proposals, research designs, fieldwork, artifact analysis, and report authorship.

Dr. Hale's experience spans California, Arizona, Nevada, and Oregon, including work for: Naval Facilities Engineering Command (NAVFAC) Southwest; California Department of Transportation (Caltrans); Western Area Power Administration; Bureau of Land Management (BLM); U.S. Army Corps of Engineers (ACOE); U.S. Fish and Wildlife Service (USFWS); California State Parks; various city and county agencies; and direct work for Native American groups. Dr. Hale has supervised numerous large-scale surveys, test excavations, data recovery programs, and geoarchaeological investigations, and has served as a third party review consultant, and an expert witness in legal proceedings. He has authored research designs, management and treatment plans, proposals, preliminary and final reports, and technical analyses.

EDUCATION

University of California, Davis
PhD, Anthropology, 2009

California State University, Sacramento
MA, Anthropology, 2001

University of California, Davis
BS, Anthropology, 1996

CERTIFICATIONS

Register of Professional Archaeologists (RPA), 2001

PROFESSIONAL AFFILIATIONS

Society for American Archaeology

Society for California Archaeology

Antelope Valley Archaeological Society

San Diego Archaeological Society

Project Experience

Development

Phase II Archaeological Data Recovery for the Newland Homes Sierra Project, San Diego County, California, 2013-present. As project manager and principal investigator, supervising data recovery investigations at two significant prehistoric archaeological sites and historic archival research of a homestead in support of the Newland Sierra Environmental Impact Report (EIR).

Phase I Archaeological Inventory and Phase II Archaeological Evaluation for the Yokohl Ranch Project, Tulare County, California, 2012-2013. As project manager and principal investigator, supervised completion of 12,000 acre survey and archaeological evaluation of 85 prehistoric and historical archaeological sites in support of the Yokohl Ranch EIR.

Phase I Inventory and Phase II Cultural Resources Evaluation for the Star Ranch Project, RBF Consulting, San Diego County, California, 2011. As project manager and principal investigator, supervised CEQA inventory and evaluation for private development.

Phase II Archaeological Evaluation of Two Prehistoric Sites, Torrey Pines Glider Port, San Diego County, California, 2012. As project manager and principal investigator, supervised CEQA evaluation of two prehistoric archaeological sites for the Torrey Pines City Park General Development Plan.

Data Recovery of One Prehistoric Site for the Rhodes Property, Sea Breeze Properties, San Diego County, California. As project manager and principal investigator, supervised CEQA compliant data recovery of a large prehistoric site for a residential development.

Archaeological Survey of the Paramount Mine Exploratory Drilling Project, Essex Environmental, Mono County, Nevada, 2006. As principal investigator and field director, conducted archaeological survey for mining exploration and prepared the technical report.

Phase I Inventory of 1,544 Acres and Phase II Evaluation of Archaeological Sites along the Western and Northwestern Boundaries, Edwards Air Force Base, Kern County, California, 2005. As field director, supervised a Phase I inventory of 1,544 acres. Recorded 30 new archaeological sites, more than a dozen "sub-modern" refuse dumps, and a variety of isolate finds. Notable sites include several early Holocene lithic scatters (Lake Mojave-, Silver Lake-, and Pinto-age deposits), a rhyolite lithic quarry, and a complex of historic dumps associated with homesteading activities around Lone Butte.

Pankey Ranch Testing, Pardee Homes, Northern San Diego County, California, 2004. As field director, supervised excavation of shovel test pits to delineate the boundaries of site CA-SDI-682, the prehistoric village of Tom-Kav. Managed field personnel, conducted excavation, and wrote portions of technical report.

Oceanside Hilton EIR, Dudek Associates, Oceanside, San Diego County, California, 2004. As principal investigator and field director, conducted a survey of the proposed Hilton Hotel at the eastern end of Buena Vista Lagoon in Carlsbad and prepared portions of technical report for an EIR.

Archaeological Survey of the La Mesa Meadows Residential Development Project, Helix Environmental, San Diego County, California, 2005. As principal investigator, conducted a survey of a proposed residential development in San Diego County.

Data Recovery of Locus O, Star Canyon Development, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California, 2004. As field director, supervised field crews for data recovery mitigation of an archaeological deposit and human remains near Tahquitz Canyon. Coordinated with Native American representatives and prepared portions of the technical report.

Linda Vista Survey, City of San Marcos Planning Department, San Diego County, California, 2003. As field director, conducted a Phase I cultural resource inventory of the proposed road realignment in San Marcos. Prepared technical reports and made recommendations for additional work to be done within the project area.

Archaeological Monitoring for Williams Communications Fiber-Optic Line, Jones and Stokes Associates, San Luis Obispo and Bakersfield, Kern and San Luis Obispo Counties, California, 2001. As resource monitor/Native American coordinator, conducted archaeological monitoring for a fiber-optic cable installation project that spanned 180 miles from San Luis Obispo to Bakersfield. Identified and protected archaeological resources in the project area in compliance with state and federal regulations. Managed Native American monitors and coordinated daily work with construction and environmental staff to facilitate project completion.

AT&T Cable Removal Project, Jones and Stokes Associates, Taft to Los Angeles, Kern and Los Angeles Counties, California, 1998. As field archaeologist, conducted a survey to determine archaeological impact by the removal of a lead-lined subsurface cable.

Subsurface Survey of a Proposed Bicycle Path Along the Columbia River Slough in Northwest Portland, City of Portland, Multnomah County, Oregon, 2000. As field archaeologist, conducted auger testing in a variable north-to-south transect at 30-meter intervals, and unit mapping.

Phase II Test Excavations, AT&T, Portland, Multnomah County, Oregon, and Vancouver, Clark County, Washington, 1999. This project determined the presence and condition of any cultural resources in the project areas that were situated on the northern and southern sides of the Columbia River in Washington and Oregon.

Education

Data Recovery for the Palomar North and Meadowood Projects, Palomar College, San Diego County, California, 2012. As principal investigator, supervised Section 106 and CEQA-compliant data recovery of the ethnohistoric village of Tom-Kav. Expert witness for litigation of archaeological work for the client.

Data Recovery Excavations in Advance of Geotechnical Coring at W-12, University of California San Diego (UCSD), San Diego County, California, 2009. As project manager and principal investigator, supervised data recovery excavations in a midden dated as early as 9,600 years before present.

Archaeological Test Excavations at Selected Sites on Vandenberg Air Force Base, University of California, Davis, Lompoc, Santa Barbara County, California, 2008. As principal investigator and field director, supervised and instructed 21 students for the 2008 U.C. Davis Field School.

Archaeological Survey and Excavations in the Polar Arctic, University of California Davis, Northwest Greenland, 2006. As researcher, conducted a project for the National Science Foundation, National Geographic, and the Inglefieldland Polar Archaeology Expedition; U.C. Davis.

Energy

Cultural and Paleontological Resources Mitigation and Monitoring for the McCoy Solar Project, Riverside County, California, 2014-Ongoing. As principal investigator, oversaw and implemented significance evaluations, mitigation, and monitoring under Section 106 guidelines for BLM and other reviewing agencies.

Cultural and Paleontological Resources Oversight (third party) of Mitigation and Monitoring for the Stateline Solar Project, San Bernardino County, California, 2015-Ongoing. As principal investigator, acted as third party oversight to First Solar's archaeological contractor for the implementation of mitigation and monitoring.

Cultural Resources Inventory and Evaluation for the Jacumba Solar Project, San Diego County, California, 2014-Ongoing. As principal investigator, oversaw and implemented inventory and significance evaluations under Section 106, CEQA, and San Diego County guidelines.

Phase II Evaluation of 19 Archaeological Sites for Soitec's Tierra Del Sol Solar Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented significance evaluations, including fieldwork and documentation, under CEQA and San Diego County guidelines within the development footprint.

Phase II Evaluation of 42 Archaeological Sites for Soitec's Rugged Solar Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented significance evaluations, including fieldwork and documentation, under CEQA and San Diego County guidelines within the development footprint.

Class III Cultural Resources Inventory for the Level 3 Fiber Optic Installation Project, Fort Irwin Army Reserve and BLM, San Bernardino County, California, 2012-2013. As Project manager and co-principal investigator, oversaw and implemented cultural resource inventory of fiber optic corridor and recordation and evaluation of contributing elements to the NRHP-eligible LADWP transmission line corridor.

Class III Cultural Resources Inventory for Soitec's Fort Irwin Solar Project, San Bernardino County, California, 2013. As project manager and co-principal investigator, oversaw and implemented cultural resources inventory.

Third Party Compliance Monitoring for the Ocotillo Wind Energy Farm, Ocotillo, Imperial County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the Tule Wind Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the Bureau of Land Management to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the East County Substation Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM and California Public Utilities Commission (CPUC) to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the Rio Mesa Solar Project, Riverside County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM to ensure adherence to mitigation measures and proper treatment of cultural resources.

Phase II Archaeological Testing of One Historic Site for the Cool Valley Solar Project, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of a historic airfield near Campo.

Phase II Archaeological Testing of Four Prehistoric Sites for the Gildred Solar Project, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of four small prehistoric sites along the ancient Lake Cahuilla shoreline.

Phase II Archaeological Testing of One Prehistoric Site for the Borrego A and B Solar Projects, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of a large prehistoric habitation site in the Imperial Valley.

Phase I Cultural Resources Inventories for the Sol Orchard and Sol Focus Solar Projects, RBF Consulting, San Diego County, California. As project manager, supervised implementation of Phase I CEQA inventories for more than 22 solar projects.

Class II Survey of 4,700 Acres for the Silurian Wind Project, Iberdrola Renewables, San Bernardino County, California, 2011. As project manager and principal investigator, supervised Section 106 inventory of proposed renewable energy project.

Class III and Class II Cultural Resources Inventory for the Tule Wind Alternative Energy Project, HDR Engineering for Iberdrola Renewables, San Diego County, California, 2010. As project manager and principal investigator, supervised inventory of 6,000 acres and recordation of nearly 200 archaeological sites, and assisted the BLM in preparation of a programmatic agreement between Iberdrola and the California State Historic Preservation Office (SHPO).

Monitoring of the Installation of Meteorological (MET) Towers for the Tule Wind Project, HDR Engineering, San Diego County, California, 2010. As project manager and principal investigator, supervised archaeological and Native American monitors during MET tower installation in the Tule Wind project area.

Jamul Substation 6, San Diego Gas & Electric Company (SDG&E), Jamul, San Diego County, California, 2004. As field director, conducted an intensive pedestrian survey of 18 acres in Jamul for a proposed substation construction project. Identified and recorded two archaeological sites within the project area. Prepared the technical report. Coordinated with paleontology subcontractor and incorporated paleontology report into ASM's archaeology technical report.

Path 15 Transmission Line Corridor, Steigers Corporation, San Joaquin Valley, Fresno and Merced Counties, California, 2004. As field director, supervised survey of over 87 miles of 400-foot transmission line corridor and over 46 miles of access roads in Merced and Fresno Counties. Supervised field crew, documented sites, coordinated with Native American representatives, coordinated access to survey areas, and prepared portions of technical report.

Carmel Valley Substation Survey, SDG&E, Carmel Valley, San Diego County, California, 2003. As field director, conducted a Phase I cultural resource inventory of a proposed power substation.

Federal

Ground-Penetrating Radar Survey and Class III Inventory for the Friendship Circle Project, Department of Homeland Security, Gulf South Research Corporation, San Diego County, California. As project manager and principal investigator, supervised and implemented a ground-penetrating radar survey and surface survey for the Friendship Circle project at Border Fields State Park, San Diego.

Military

Phase II Evaluation of 31 High Complexity Sites on Edwards Air Force Base, CH2MHill/JT3, Kern and Los Angeles Counties, California, 2010. As project manager, oversaw Section 106 test excavations at 31 prehistoric archaeological sites.

Phase II Evaluation of 85 Archaeological Sites on Edwards Air Force Base, CH2MHill/JT3, Kern and Los Angeles Counties, California, 2010. As project manager and principal investigator, supervised Section 106 test excavations at 42 prehistoric and 43 historic archaeological sites.

Western Acquisition Survey, Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, San Bernardino County, California, 2010. As principal investigator, managed the survey of 10,000 acres on land administered by the BLM in Johnson Valley, west of the base. Duties included project management, coordination with BLM Barstow field office and MCAGCC 29 Palms personnel, coordinating and supervising field crews, as well as document preparation.

Management Plan for the Coso Rock Art National Historic Landmark (NHL), Naval Air Weapons Station (NAWS) China Lake, Inyo County, California, 2010. As project manager, supervised and co-authored a management plan for the Coso Rock Art NHL, including arranging and implementing stakeholder meetings and field testing the implementation plan.

Section 110 Intensive Archaeological Survey of the Cole Flat Training Area, NAWS China Lake, Inyo County, California, 2009. As project manager and principal investigator, supervised the survey of 5,400 acres near the Coso Rock Art NHL.

Phase I Survey of Selected Parcels in Five Training Areas, MCAGCC Twentynine Palms, San Bernardino County, California, 2009. As project manager and principal investigator, supervised survey of 4,500 acres in the Blacktop, Lava, Lavic Lake, Sunshine Peak, and Quackenbush training areas.

Phase I Survey of Aerial Maneuver Zones for the 53 AMZ Project, MCAGCC Twentynine Palms, California, 2009. As project manager and principal investigator, supervised survey of 72 Aerial Maneuver Zones. Client Reference: Leslie Glover, MCAGCC 29 Palms, 760.830.5369.

Cultural Resources Inventory and Evaluation for the Skaggs Island BRAC Disposal Archaeological Survey, Naval Communications Station, Sonoma County, California, 2011-2012. As principal investigator, supervised survey of installation and recordation and evaluation of historic civilian and military resources.

Phase I Survey of 8,100 Acres on Edwards Air Force Base, ACOE, Kern County, California, 2008–2009. As principal investigator, supervised survey of 8,100 acres on Edward Air Force Base.

Phase I and II Survey of 2,500 Acres and Evaluation of 50 Sites on Edwards Air Force Base, ACOE, Kern County, California, 2008. As principal investigator, supervised survey of 2,500 acres and evaluation of 50 sites on Edward Air Force Base.

Cultural Resources Inventory and Evaluation for the Concord Inland BRAC Disposal Archaeological Survey, Naval Weapons Station, Seal Beach, Detachment Concord, Contra Costa County, California. As principal investigator, supervised survey of 5,200 acres and recordation and evaluation of historic civilian and military resources, and prehistoric archaeological sites.

Archaeological Evaluation of Eight Prehistoric Sites in the Emerson and Quackenbush Training Areas, ACOE, MCAGCC Twentynine Palms, San Bernardino County, California, 2005. As field director, supervised excavation of eight prehistoric sites on the Marine Corps base in Twentynine Palms, California.

Archaeological Evaluation of 22 Sites on Edwards Air Force Base, ACOE, San Bernardino County, California, 2005. As field director, supervised the National Register evaluation of 22 sites at Edwards Air Force Base.

Naval Base Point Loma Site Recordation, NAVFAC Southwest (SW), Point Loma, San Diego County, California, 2004. As principal investigator and field director, supervised relocation of 33 sites located on Naval Base Point Loma. Reviewed site documentation and re-recorded sites that were improperly documented by past surveys.

Archaeological Testing of 23 Sites in the Las Pulgas Corridor, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2004. As field director, supervised field crews for Phase II testing and mechanical coring of 23 sites on Camp Pendleton. Coordinated with coring contractor and base personnel. Documented sites in the field. Supervised field crews and prepared portions of technical report.

Rose-Arizone, Clay, and Photo Drainage, and Road Improvement Surveys, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2004. As field director, supervised archaeological surveys and the placement of protective signing on 750 sites. Coordinated access to the island and supervised one crew member.

Remote Sensing, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2004. As Global Positioning System (GPS) specialist, conducted data collection and image rectification for a remote sensing project in the detection of archaeological sites on the base. Supervised one crew member.

MCB Camp Pendleton Burn Survey, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2002. As field director, supervised an archaeological survey of 1,500 acres in the De Luz and Case Springs areas of Camp Pendleton. Managed field crews, documented archaeological sites, prepared site forms and portions of technical report.

Survey of Yuma Stormwater Basin, NAVFAC SW, MCAS Yuma, Yuma County, Arizona, 2002. As field director, supervised survey of stormwater basin along the Marine Corps airfield at MCAS Yuma. Managed field crew and prepared technical report. Client

Archaeological Coring of SDI-811, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2002. As field director, supervised first phase of a geologic coring project for a shell midden site along the coast of MCB Camp Pendleton, San Diego County. Coordinated with coring contractor and base personnel. Managed field monitors and field crew.

Archaeological Testing and Survey of the Lemon Tank Area, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2002. Conducted excavations, survey, and site recording.

Evaluation of Four Prehistoric Sites, Jones and Stokes Associates, Camp Roberts National Guard, San Luis Obispo County, California, 1998. As field technician, conducted excavation in order to determine the boundaries of the site for further mitigation.

Evaluation of Nine Prehistoric Sites, Edwards Air Force Base, San Bernardino County, California, 1999. As field archaeologist, evaluated nine sites through excavation to determine overall sensitivity and value of the archaeological remains that characterize the region.

Archaeological Survey and Excavation, ACOE, MCAGCC Twentynine Palms, San Bernardino County, California, 1998. As field archaeologist, participated in nine field rotations averaging 10 days each. Conducted survey of portions of the Marine Corps base to determine the distribution of cultural materials, and subsequently excavate sites based on priority. This area is characterized as high desert with the typically associated flora and fauna and archaeological sites that range in age from Early to Late Holocene.

Resource Management

Archaeological Data Recovery Excavations at Border Fields State Park, California State Parks, Imperial Beach, San Diego County, California, 2005. As field director, supervised excavation of prehistoric sites located within the APE of a fence along the U.S.–Mexico Border in San Diego County. Prepared technical report.

Archaeological Salvage Excavations of Two Ollas in Hellhole Canyon, BLM, San Diego County, California, 2005. As principal investigator, relocated a cache of prehistoric ceramic artifacts uncovered during wildfires in San Diego County. Documented cache and collected artifacts for subsequent reconstruction in the ASM laboratory. Prepared technical report detailing project.

Archaeological Data Recovery Excavations at CA-SDI-16691, Jackson Pendo Development Company, Escondido, San Diego County, California, 2005. As principal investigator, supervised data recovery excavation at a Late Prehistoric site in Escondido, California.

El Cuervo Wetlands Mitigation, City of San Diego Land Development Review Department and Mitigation Monitoring Coordination, Carmel Valley, San Diego County, California, 2004. As co-principal investigator, supervised an archaeological monitoring project in central San Diego County, conducted test excavation of one site identified during monitoring. The site was evaluated as not significant. Prepared portions of technical report and supervised on-site monitor.

Milk Vetch Emergency, Imperial Irrigation District, Imperial County, California, 2002. As archaeological monitor, conducted emergency monitoring along transmission line corridor in Imperial County. Coordinated with IID and construction personnel. Prepared technical report.

Burial Salvage Excavations at the Carp Site, CA-MER-295, California Department of Parks and Recreation, Los Banos, Merced County, California, 1999. As field supervisor, directed excavations at CA-MER-295 in the central San Joaquin Valley in order to salvage cultural remains (including burials) from further destruction by the San Joaquin River.

Archaeological Survey of the Silver Lake Recreation Area, El Dorado Irrigation District, El Dorado County, California, 2006. As principal investigator and field director, supervised an archaeological survey of the Silver Lake Recreation area.

Transportation

Ortega Highway Monitoring, City of San Juan Capistrano, Orange County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of water conveyance facilities and road repairs.

Archaeological Testing and Ground Penetrating Radar Study of the Forester Creek Biological Mitigation Area, Caltrans District 11, Santee, San Diego County, California, 2005. As principal investigator and field director, supervised archaeological testing of a private parcel.

Bridge 230.6 Replacement, North County Transit District, Agua Hedionda, Carlsbad, San Diego County, California, 2004. As principal investigator and field director, managed an archaeological survey of an APE associated with the replacement of and historic railroad bridge. Recorded archaeological sites within APE and prepared portions of technical report.

Little Lake Phase II Testing, Caltrans District 5, Little Lake, Inyo County, California, 2004. As field director, supervised Phase II testing of four sites including the ethnohistoric village of *Pagunda* near the town of Little Lake. Supervised field crews, coordinated fieldwork with Caltrans and subcontractors, and prepared portions of technical report.

Extended Phase I Testing, Caltrans District 05, Little Lake, Inyo County, California, 2003. As field director, supervised fieldwork for extended Phase I testing of one prehistoric site along U.S. Highway 395 in Inyo County. Prepared portions of technical report.

Cartago and Olancha Four-Lane Project Test Excavations, Caltrans District 05, Inyo County, California, 2002. As field director, supervised test excavations of 15 sites for the proposed widening of U.S. Highway 395 near Cartago and Olancha. Supervised all fieldwork and managed a team of 12 field archaeologists. Coordinated selected specialized studies, conducted ground stone analysis, and prepared large portions of the resulting 800+-page report.

Survey of Amtrak Second Mainline Right-of-Way, North County Transit District, Oceanside, San Diego County, California, 2002. As co-field director, managed an archaeological survey of 6.2 miles of North County Transportation District railroad right-of-way near San Onofre, California.

State Route 905 Survey, Caltrans District 11, San Diego County, California, 2002. As co-field director, conducted survey and recording of sites along the State Route 905 right-of-way in southern San Diego County. Documented three prehistoric sites within the proposed right-of-way. Created site maps and prepared site forms.

Evaluation of 11 Sites along U.S. 395, Caltrans District 05, Blackrock, Inyo County, California, 2000. As crew chief, managed 6-18 personnel, prepared paperwork and report. Made decisions surrounding site excavations in Owens Valley. Project included Phase II test excavation of numerous sites ranging in age from early to late Holocene.

Phase I Survey, Caltrans District 10, Stockton, San Joaquin County, California, 1997. As field archaeologist, conducted various survey and excavation projects for Caltrans throughout central California. Conducted survey and excavation, operated as a graduate student assistant to the District 10 archaeologist dealing with compliance issues, prepared site mapping and technical reports including Archaeological Survey Reports (ASR), Historic Properties Survey Reports (HPSR), and Negative Declarations.

Phase I Survey/TEA, Caltrans, Inyo and Mono Counties, California, 1996–1997. As field archaeologist, conducted survey of most major highways in Mono and Inyo Counties, California. Documented the distribution of all cultural material within the Caltrans right-of-way in order to determine impacts by road widening.

Tribal

Section 106 Mitigation Development and Tribal Consultation Assistance, BLM, San Diego County, California, 2011–2012. As project manager, assisted the BLM in development of Historic Properties Treatment Plan, Tribal Participation Plan, and other mitigation measures for the Tule Wind project, McCain Valley California.

Mitigative Screening, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California, 2003. As field director, supervised archaeological mitigation of an impacted burial site on the Agua Caliente Reservation. Prepared mapping of the project, coordinated field efforts with Tribal representatives, oversaw monitoring of the project, and prepared portions of the technical report.

Water/Wastewater

San Clemente Water Recycling Monitoring, City of San Clemente, Orange County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of a new water conveyance pipeline. Duties include preparation of a discovery and treatment plan.

Poseidon Resources Desalination Plant and Pipeline Monitoring, City of Carlsbad, San Diego County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of the desalination plant and a new water conveyance pipeline. Duties include preparation of a discovery and treatment plan and evaluation of archaeological discoveries.

Poseidon Resources Desalination Plant and Pipeline Wetland Mitigation Archaeological Evaluation, City of San Diego, San Diego County, California, 2013. As project manager and principal investigator, developed methods and strategies to evaluate archaeological deposits most likely related to the 1782 ethnohistoric Kumeyaay village of La Punta located within the wetland mitigation area. Project included geotechnical coring and backhoe exploration to locate and evaluate buried archaeological deposits Duties included assistance provided to the USFWS for NAGPRA consultation and implementation.

Lee Lake Cultural Resources Inventory, Lee Lake Water District, Riverside County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate and implement cultural resources inventory for the construction of a new pipeline and water storage facility.

Cultural Resources Monitoring for the City of Napa Levee Improvement Project, ACOE, Sacramento District, Sacramento, California, 2010-2011. As principal investigator, supervised archaeological monitoring requiring HAZWOPER certified archaeologists to treat historical archaeological discoveries for a levee and stormwater improvement project.

Data Recovery Excavations at the Ridge Hill Facilities Site (SDI-18472), Padre Dam Municipal Water District (PDMWD), San Diego County, California, 2009. As principal investigator, supervised data recovery of a complex late prehistoric habitation site.

San Clemente Canyon Survey, City of San Diego Metropolitan Wastewater Department, City of San Diego, San Diego County, California, 2004. As principal investigator and field director, supervised and conducted an intensive pedestrian survey of proposed access road maintenance for the San Clemente Canyon sewer line. Two cultural resources were identified. Conducted site documentation, prepared sites forms and technical report. Managed survey crew member.

Lake Murray Survey, City of San Diego Metropolitan Wastewater Department, La Mesa, San Diego County, California, 2003. As field director, conducted survey of proposed trunk sewer replacement in La Mesa. Prepared portions of the technical report.

Imperial Irrigation District's Phase II Testing, Imperial Irrigation District, Imperial County, California, 2003. As field director, supervised Phase II testing of eight sites in the Colorado Desert. Managed field crews, conducted test excavations, and prepared site documentation and portions of the technical report.

Carmel Valley Archaeological Monitoring, City of San Diego Metropolitan Wastewater Department, Carmel Valley, San Diego County, California, 2002. As field monitor for pre-trenching for placement of sewer line, conducted monitoring and wrote portions of technical report.

EIR/EIS Preparation

Dr. Hale currently assists in the preparation of technical descriptions and analyses for environmental impact statements and reports at the state and federal levels for Dudek projects. Examples of completed environmental sections include those prepared for the Yokohl Ranch, Rio Mesa Solar, Soitec Rugged and Tierra Del Sol Solar, SDG&E's Wood to Steel project, and various others. More details are available upon request.

Other Relevant Experience

Training

- 2012 - Accounting and Finance for Non-Financial Managers, UCSD Rady School of Business Management
- 2010 - ESOP Planning and Management, UCSD Rady School of Business Management
- 2004 - Ground Penetrating Radar Field Methods and Interpretation Certificate
- 2002, 2010 - GPS Field Methods Training, ASC Scientific

Teaching

- 2008 - Assistant Professor, Archaeology, U.C. Davis
- 2008 - Instructor/ Principal Investigator, 2008 UC Davis Archaeology Field School, Vandenberg Air Force Base, California.
- 2005–2008 – Level III Teaching Assistant, U.C. Davis; taught discussion sections/ lectures for Human Evolution, Archaeology, and Human Ecology
- 1998–1999 – Acted as Public Education Coordinator for the Museum of Anthropology at UC Davis; included instructing a course teaching archaeology students how to inform the public about the value of anthropology through in-class presentations, exhibits, and the building of 'teaching trunks' for people in grades 1–12 of primary and secondary education
- 1997–1998 - Substitute teacher with an Emergency Credential in the Woodland and Davis Joint Unified School Districts for grades K–12, all subjects excluding foreign languages
- 1997–present – Regularly perform presentations about the value of archaeology in classrooms at the level of the grades 1–12
- 1996 – Teaching assistant at the U.C. Davis archaeological field school; job duties included student management and instruction in the methods of excavation and survey.

Publications

Selected Technical Reports

Hale, Micah J. 2010. "Limited Archaeological Excavations at SDI-4669 (SDM-W-12A)." In Advance of Geotechnical Coring, University House Rehabilitation Project, University of California at San Diego, La Jolla, California. Submitted to Ione Stiegler Architecture, La Jolla, California. Report on file at South Coastal Information Center, SDSU.

Hale, Micah J. 2010. Results of Archaeological Monitoring for Meteorological Masts in McCain Valley, San Diego County, California. Prepared for HDR Engineering Inc.

Hale, Micah J. 2007. Archaeological Survey of the Silver Lake Recreation Area, El Dorado Irrigation District, El Dorado County, California. Prepared for Trish Fernandez, El Dorado Irrigation District, El Dorado County, California.

Hale, Micah J. 2005. "Ground Stone Analysis." In From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California, by Micah J. Hale and Mark S. Becker. Report submitted to Southwest Division of Naval Facilities.

Hale, Micah J. 2005. Cultural Resources Inventory for the Proposed San Diego Model Schools Development Project. ASM Affiliates Inc., Carlsbad, California. Prepared for the City of San Diego, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Replacement of Bridge 230.6 over Agua Hedionda Lagoon, San Diego County, California. Submitted to North County Transit District, San Diego County, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Gawle Property, San Diego County, California. Submitted to Helix Environmental for the City of San Diego.

Hale, Micah J. 2004. Cultural Resources Inventory for the Hines Nursery, San Diego County, California. Submitted to Hines Nurseries, Rainbow Valley, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the San Clemente Canyon Trunk Sewer Maintenance and Access Routes, San Diego County, California. Submitted to Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Montezuma Trunk Sewer Replacement, San Diego County, California. Submitted to Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2004. Cultural Resources Inventory for the Oceanside Hotel EIR, San Diego County, California. Submitted to Dudek for the City of Oceanside, California.

Hale, Micah J. 2004. Historic Resources Mitigation Monitoring of the El Cuervo Norte Project, San Diego County, California. Submitted to the City of San Diego.

Hale, Micah J. 2004. Emergency Test Excavations of an Exposed Olla, Riverside County, California. Submitted to BLM, Riverside County, California.

Hale, Micah J. 2004. Cultural Resources Monitoring for Geotechnical Coring Related to the All-American Canal Lining Project, Imperial County, California. Submitted to Imperial Irrigation District, Imperial County, California.

Hale, Micah J. 2004. Cultural Resources Monitoring of Geotechnical Coring Related to the Coachella Canal Lining Project, Riverside County, California. Submitted to Imperial Irrigation District, Riverside County, California.

Hale, Micah J. 2004. "Ground and Battered Stone Analysis." In Data Recovery Investigations at the Eucalyptus Site, CA-SDI-6954, San Diego County, California. Prepared by Don Laylander, ASM Affiliates Inc., Carlsbad, California. Submitted to EDAW, Inc.

Hale, Micah J. 2003. Cultural Resources Inventory for the Linda Vista Drive Re-Alignment Alternatives, City of San Marcos, California. Submitted to Nolte for the City of San Marcos.

Hale, Micah J. 2003. Cultural Resources Inventory for the Lake Murray Trunk Sewer Replacement, San Diego County, California. Submitted to the Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2000. Cultural Resource Monitoring Report. Jones and Stokes Associates Inc. Prepared for AT&T Corp., Atlanta, Georgia, for the AT&T cable removal project from Lucin, Utah, to Red Bluff, California.

Hale, Micah J. 2000. "Ground and Battered Stone Analysis." In Report on Excavations at Four Locations in the Lead Mountain Vicinity of the 29-Palms Marine Base, edited by Mark Basgall. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Ground and Battered Stone Analysis." In Report on Excavations at CA-MER-295, edited by Mark Basgall and R. Bethard. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Invertebrate Analysis." In Report on Excavations at CA-MER-295, edited by Mark Basgall and Mark Giambastiani. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Site Reports for Sites SBR-9415 and SBR-9420." In Report on Excavations at Lead Mountain in Twentynine Palms Marine Corps Air Ground Combat Training Center, edited by Mark Basgall. Sacramento Archaeological Research Center.

Hale, Micah J. 1999. "Ground and Battered Stone Analysis." In Muddle in the Middle: Phase II Excavations of Five Sites in Kern County, California, edited by Mark Basgall. Prepared for V. Levulett, Environmental Management, Caltrans District 5, San Luis Obispo. Sacramento Archaeological Research Center.

Hale, Micah J., and Brad Comeau. 2009. Data Recovery Excavations at CA-SDI-18472 for the Proposed Padre Dam Municipal Water District Secondary Connection Project (Ridge Hill Facilities) Johnstown, San Diego County, California. Prepared for Mr. Albert Lau, Engineering Manager, Padre Dam Municipal Water District.

Hale, Micah, Brad Comeau, and Chad Willis. 2010. Class II and Class III Cultural Resources Inventory Report for the Tule Wind Project, McCain Valley, San Diego County, California. Prepared for HDR Engineering Inc. Report on file at the South Coastal Information Center, SDSU.

Hale, Micah J., and John R. Cook. 2005. Results of Ground Penetrating Radar Investigations at CA-SDI-10148 in the Forester Creek Biological Mitigation Site, San Diego County, California. With contributions by Jeffrey S. Patterson. Prepared for Chris White, Caltrans District 11.

Hale, Micah J., and Mark S. Becker. 2006. From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California. ASM Affiliates, Carlsbad, California. Submitted to Southwest Division of Naval Facilities.

Hale, Micah J., and Mark A. Giambastiani. 2010. A Cultural Resources Inventory for Sample Surveys in Selected Training Areas, Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, San Bernardino County, California. Prepared for Marine Air Ground Task Force Training Command, Natural Resources and Environmental Affairs, Twentynine Palms, California.

Hale, Micah, and Mark Giambastiani. 2010. Archaeological Resources Survey Report Aerial Maneuver Zone (AMZ) Project at the Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California, San Bernardino County, California. Prepared for Marine Air Ground Task Force Training Command, Natural Resources and Environmental Affairs, Twentynine Palms, California.

Hale, Micah, and Mark Giambastiani. 2010. An Archaeological Survey of 3,650 Acres at Cole Flat, Naval Air Weapons Station (NAWS), China Lake, California. Prepared for Mike Baskerville, Base Archaeologist, NAWS China Lake, California.

Hale, Micah J., Mark Giambastiani, Michael Richards, and David Iversen. 2009. Phase II Cultural Resource Evaluations at 51 Archaeological Sites in Management Regions 1A, 1B, 2B, 2C, and 3E, Bissell Hills and Paiute Ponds, Edwards Air Force Base, Kern and Los Angeles Counties, California. Prepared for U.S. Army Corps of Engineers under contract numbers W91238-07-F-0051 and W91238-07-F-0052.

Basgall, Mark, Lynn Johnson, and Micah Hale. 2002. An Evaluation of Four Archaeological Sites in the Lead Mountain Training Area, Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California. Prepared for United States Marine Corps Air Ground Combat Center, Twentynine Palms, California. Prepared by Archaeological Research Center, Institute of Archaeology and Cultural Studies, Department of Anthropology, California State University, Sacramento.

Becker, Mark S., and Micah J. Hale. 2004. "Flaked Stone and Ground Stone Artifact Analysis." In Phase II Archaeological Testing and Evaluation of CA-INY-3647, CA-INY-3650/H, CA-INY-3826, and P-14-7356, Little Lake Rehabilitation, U.S. 395, Inyo County, California, edited by Brian Byrd and Seetha Reddy, ASM Affiliates. Prepared for Caltrans District 6, Fresno.

Byrd, Brian F., and Micah J. Hale. 2005. Testing and Evaluation of CA-SDI-13,930 on Camp Pendleton Marine Corps Base, San Diego County, California: A Paleoenvironmental Approach. ASM Affiliates, Carlsbad, California. Prepared for Southwest Division Naval Facilities Engineering Command.

Byrd, Brian F., and Micah J. Hale. 2004. Final Report on the Rose-Arizone Site Survey and Documentation, San Clemente Island. Prepared for Dr. Andrew Yatsko, NAVFAC SW, South Bay Area Focus Team.

Byrd, Brian F., and Micah J. Hale. 2004. Final Report on the San Clemente Island Protective Signing and Maintenance Project. Prepared for Dr. Andrew Yatsko, NAVFAC SW, South Bay Area Focus Team.

Byrd, Brian F., and Micah J. Hale. 2004. Final Report on the San Clemente Island Road Improvement Survey. Prepared for Dr. Andrew Yatsko, NAVFAC SW, South Bay Area Focus Team.

Byrd, Brian F., Micah J. Hale, and Sinéad Ní Ghabhláin. 2004. "Archaeological Testing at INY-3647." In Phase II Archaeological Testing and Evaluation of CA-INY-3647, CA-INY-3650/H, CA-INY-3826, and P-14-7356, Little Lake Rehabilitation, U.S. 395, Inyo County, California, edited by Brian Byrd and Seetha Reddy, ASM Affiliates. Prepared for Caltrans District 6, Fresno.

Byrd, Brian F., Micah J. Hale, and Sinéad Ní Ghabhláin. 2004. "Archaeological Testing at INY-3650/H." In Phase II Archaeological Testing and Evaluation of CA-INY-3647, CA-INY-3650/H, CA-INY-3826, and P-14-7356, Little Lake Rehabilitation, U.S. 395, Inyo County, California, edited by Brian Byrd and Seetha Reddy, ASM Affiliates. Prepared for Caltrans District 6, Fresno.

Byrd, Brian F., Micah J. Hale, and Sinéad Ní Ghabhláin. 2004. Archaeological Testing at INY-3826. In Phase II Archaeological Testing and Evaluation of CA-INY-3647, CA-INY-3650/H, CA-INY-3826, and P-14-7356, Little Lake Rehabilitation, U.S. 395, Inyo County, California, edited by Brian Byrd and Seetha Reddy, ASM Affiliates. Prepared for Caltrans District 6, Fresno.

Byrd, Brian F., and Micah J. Hale. 2003. Final Report on Extended Phase I Excavation at CA-INY-2207/2758, Little Lake Rehab Project, Inyo County, California. ASM Affiliates, Encinitas. Prepared for Lynn Faraone, Chief, Central California Cultural Resource Branch, California Department of Transportation.

Byrd, Brian F., and Micah J. Hale. 2002. Phase II Investigations of 15 Prehistoric Sites for the Cartago-Olancha Four-Lane Project, U.S. 395, Owens Valley, California. ASM Affiliates Inc. Prepared for Caltrans District 6, Fresno.

Byrd, Brian F., and Micah J. Hale. 2001. Research Design for Phase II Investigations of 14 Prehistoric Sites for the Cartago-Olancha Four-Lane Project, U.S. 395, Owens Valley, California. ASM Affiliates Inc. Prepared for Caltrans District 6, Fresno.

Cook, John R., Collin O'Neill, and Micah J. Hale. 2001. Archaeological Survey for the Amtrak Second Main Line, San Onofre Segment, MP 210.1 to 214.7, San Diego County. ASM Affiliates Inc. Draft report prepared for North County Transit District.

Giambastiani, M., M. Hale, M. Richards, and S. Shelley. 2008. Draft Report Phase II Cultural Resource Evaluations at 47 Archaeological Sites on the East and Northeast Shores of Rogers Lake, Management Region 3, Edwards Air Force Base, Kern and Los Angeles Counties, California. Report submitted to Edward Air Force Base, Base Historic Preservation Officer.

Giambastiani, G., M. Hale, S. Ni Ghabhláin, and D. Iversen. 2006. Phase II Cultural Resource Evaluation of 21 Archaeological Sites along the Western and Northwestern Boundary Fence, Edwards AFB, Kern and Los Angeles Counties, California. Submitted to Earth Tech Inc., Colton, California.

Hector, Susan, Micah J. Hale, and Catherine Wright. 2003. Cultural Resource Inventory of the Path 15 Los Banos-Gates Transmission Line Construction Project, Merced and Fresno Counties, California. Contract No. 03-186-01-01-ASM. Prepared for Steigers Corporation, Littleton, Colorado.

Laylander, Don, and Micah J. Hale. 2004. Data Recovery Excavations at Locus O, CA-RIV-45. ASM Affiliates Inc., Carlsbad, California. Submitted to Agua Caliente Band of Cahuilla Indians.

Reddy, Seetha N., and Micah J. Hale. 2003. Archaeological Survey of Portions of the De Luz Housing Area, O'Neill Lake, and the Case Spring Highlands, Marine Corps Base Camp Pendleton, California. ASM Affiliates, Encinitas, California. Prepared for NAVFAC SW, San Diego, California.

Whitley, David, and Micah Hale. 2010. Management Plan for the Coso Rock Art District National Historic Landmark. Prepared for NAVFAC SW, San Diego County, California.

Other Publications

Hale, Micah J. 2012. "Malcolm Rogers' Archaeology in Coastal San Diego." Book chapter in preparation; edited by Don Laylander.

Hale, Micah J. 2011. "Modeling Socioeconomic Discontinuity in Southern Alta California." In, California Archaeology 2:2: December 2010, pp. 203-250.

Hale, Micah J. 2010. "A Comment on Hildebrandt et al. (2009) Shellfish Transport, Caloric Return Rates, and Prehistoric Feasting." In California Archaeology 3:111-113.

Hale, Micah J. 2009. Santa Barbara and San Diego: Contrasting Adaptive Strategies in Southern California. PhD dissertation; University of California, Davis.

Hale, Micah J. n.d. Preserving Cultural Heritage Through Public Outreach: A Curriculum for Jr. High and High School.

Hale, Micah J. 2005. Processing Economies, Coastal Settlement, and Intensification in Northern San Diego County. In Proceedings of the Society for California Archaeology, Volume 18.

Hale, Micah J. 2001. Technological and Social Organization of the Millingstone Horizon in Southern California. Master's thesis; California State University, Sacramento.

Hale, Micah J. 2000. Consumer Anthropology: Theory and Method of Recognizing and Interpreting Consumption Patterns for Product Development and Marketing Strategies. Developed for Richard Knight, Director of Intelligent Products, Addidas, USA.

Hale, Micah J., Richard McElreath, and Robert Bettinger. 2012. (in prep.) Modeling Time Minimizing and Energy Maximizing Adaptive Strategies.

Hale, Micah J., and Peter Richerson. 2012. (in prep.) Investigating the Rate-Limiting Factors of Cultural Evolution: Archaeological Evidence from Southern California.

Hale, Micah J., and Bruce Winterhalder. 2012. (in prep.) Discontinuous Sociocultural Evolution

Editorial Reviewer

Hale, Micah J. 2011. Editorial Reviewer, *Journal of California Archaeology*, Left Coast Press, California.

Hale, Micah J. 2011. Editorial reviewer, *Journal of California and Great Basin Anthropology*, Malki Museum Press, California.

Hale, Micah J. 2010. Editorial reviewer, *Pacific Coast Archaeology Society*, California.

Presentations

Hale, Micah J. 2012. *The Data Matter: Contributions of the Sacramento State Archaeological Research Center*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2012. *Andy Yatsko, the Human Transit: Celebrating His Lifetime Contributions*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2012. *Malcolm Rogers' Work Along the San Diego Coast*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2011. *Tracing the Origins of Processing Economies in the Far West: A View from Coastal Southern California*. Presented at the Yucca Valley Archaeopalooza Conference, 29 Palms, California.

Hale, Micah J. 2011. *Adaptive Divergence Among Southern California Hunter Gatherers*. Presented at the 2011 Society for California Archaeology Meetings, Rohnert Park, California.

Hale, Micah J. 2011. *A 10,000 Year Old Habitation at the University House, La Jolla: Implications for Trans-Holocene Socioeconomic Stability in San Diego*. Presented at the 2011 Society for American Archaeology Meetings, Sacramento, California.

Hale, Micah J. 2010. *Using the Ideal Free Distribution to Model Socioeconomic Discontinuity Among Hunter-Gatherers*. Paper presented at the 2009 Society for American Archaeology Meetings, St. Louis, Missouri. Micah Hale, Symposium Chair.

Hale, Micah J. 2005. *Investigating the Role of Acorns in Southern California Hunter-Gatherer Economies*. Guest Speaker at the Antelope Valley Archaeological Society Meeting.

Hale, Micah J. 2005. *Processing Economies, Coastal Settlement, and Intensification in Northern San Diego County*. Presented at the Society for California Archaeology, Sacramento.

Hale, Micah J. 2004. *Cultural Resource Management in Practice: An Overview of Methodological Approaches*. Presented at the Imperial Valley Desert Museum Annual Meetings.

Hale, Micah J. 2003. *The Adaptive Significance of Technological Organization during the Holocene in Southern California*. Discussant in a symposium entitled, *Change and Cultural Adaptations Along the California Coast*. Organized by Seetha Reddy for the 68th Annual Meetings of the Society for American Archaeology, Milwaukee, Wisconsin. David Yesner and Roger Colten, Chairs.

Hale, Micah J. 2003. *The Organization of Subsistence Technology in Southern California During the Holocene.* Guest Speaker for the San Diego County Archaeological Society, January 28, 2003, San Diego.

Hale, Micah J. 2002. *Prehistory Along the Southwestern Shore of Owens Lake: Preliminary Results from the Cartago-Olancha Project*. Presented at the 2002 Northern California Data Sharing Meetings, Society for California Archaeology, Santa Cruz, California.

Hale, Micah J. 2002. *Ground and Battered Stone Along the Western Shores of Owens Lake*. Presented at the 2002 Northern California Data Sharing Meetings, Society for California Archaeology, Santa Cruz, California.

Hale, Micah J. 2001. *Technological and Social Organization during the Millingstone Horizon of Southern California*. Presented at the Society for California Archaeology Annual Meeting, Modesto.

Hale, Micah J. 1999. *The Analysis Method of Formatting Presentations and Lesson Plans in Archaeology*. Presented at the Society for American Archaeology 64th Annual Meeting, Chicago, Illinois.

Hale, Micah J. 1998. *A Practical and Effective Method for Teaching Archaeology to the Public*. Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

Awards/Commendations

- 2010 – NAVFAC SW, Camp Pendleton, Research Grant, $59,000
- 2008 – U.S. Air Force, Vandenberg AFB, Radiocarbon Grant, $25,000
- 2008 – Fieldwork Fellowship, Graduate Studies, UC Davis, $2,010
- 2007 – Fieldwork Fellowship, Graduate Studies, UC Davis, $1,800
- 2006 – Fieldwork Fellowship, Graduate Studies, UC Davis, $5,650
- 2005–2009 – Graduate Fee Fellowship/Stipend, UC Davis, $74,500

Clearances

- Department of Defense (DoD) High-Security Clearance for SPAWAR, Naval Base Point Loma, NALF San Clemente Island, Vandenberg Air Force Base, MCAGCC 29 Palms, Edwards Air Force Base, NAWS China Lake, Yuma Proving Grounds, and MCB Camp Pendleton

APPENDIX C

Botanical Survey Results for the Las Gallinas Valley Sanitary District Project, San Rafael, Marin County, California

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MEMORANDUM

To: Stephanie Tang, Albert A. Webb Associates
From: Laura Burris, Dudek
Subject: Botanical Survey Results for the Las Gallinas Valley Sanitary District Project, San Rafael, Marin County, California
Date: October 1, 2018
Attachment(s): A – Figures 1-3, B – Plant Species Observed

This memorandum documents the results of a focused survey for soft bird's-beak (*Chloropyron molle* ssp. *molle*), a California Rare Plant Rank (CRPR) 1B.2, California State-listed Rare, and Federally-listed Endangered plant, on the Las Gallinas Valley Sanitary District project (project) site. The purpose of this memorandum is to describe the methods and results of the survey to support implementation of the project.

STUDY AREA DESCRIPTION AND LOCATION

The approximately 12.65-acre project study area (study area) is located in San Rafael, California at 300 Smith Ranch Road (Figure 1). The proposed project is located approximately one mile east of U.S. Highway 101 and one mile west of the western shoreline of San Pablo Bay. The project is located in Section 10 of Township 2 North, and Range 6 West of the U.S. Geological Survey (USGS) *Novato* 7.5' quadrangle. The approximate center of the study area corresponds to 38°01'30.54" north latitude and 122°31'06.82" west longitude.

The survey was conducted in areas with potentially suitable habitat for soft bird's-beak within the study area, including several ponds in the southeastern portion of the study area. In addition, potentially suitable salt marsh habitat within 100 feet of the project site to the east of the ponds were included in the survey as part of a survey buffer.

SPECIES INFORMATION

Habitat Description

Soft bird's-beak is a hemiparasitic annual herb in the Orobanchaceae family that grow in alkaline and saline soils within coastal marshes and swamps, and is currently known from occurrences in Contra Costa, Solano, and Napa counties (Figure 2). It historically occurred in suitable habitat in Marin, Sacramento, and Sonoma counties; however, it has not been documented in these counties recently and is presumed extirpated. Documented occurrences occur in coastal salt marshes and swamps and this species typically blooms June through November.

Taxonomy

Soft bird's-beak is distinguished from the only other look-alike species in the vicinity, Point Reyes bird's-beak (*Chloropyron maritimum ssp. palustre*) by having 2 fertile stamens instead of 4, as well as 3 to 7 lobed bracts versus entire or slightly notched bracts (Jepson Flora Project 2018).

METHODS

Reference Population Checks

The species blooming period is described as June through November in the California Native Plant Society (CNPS) rare plant inventory. The nearest recently documented occurrences of this species are both at Point Pinole Regional Park, approximately 8 miles southeast of the project site. These reference populations include California Natural Diversity Database (CNDDB) element occurrences No. 1 and No. 15. Occurrence No. 1 contains a small population of soft bird's-beak along an inlet at the eastern end of the park observed by Dudek botanist during an August 8, 2018 visit. Occurrence No. 15 is north of Occurrence No. 1 and no soft bird's-beak was noted at this location during the August 8, 2018 visit. Associated plants at the reference populations include salt marsh adapted species such as pickleweed (*Salicornia virginica*), saltgrass (*Distichlis spicata*), and alkali heath (*Frankenia salina*).

Survey

Dudek botanist Laura Burris performed a focused botanical survey of the study area and a 100-foot buffer on August 8, 2018. Focused plant surveys were floristic in nature and conformed to the CNPS Botanical Survey Guidelines (CNPS 2001), Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018), and the General Rare Plant Survey Guidelines (Cypher 2002). Ms. Burris conducted the survey on foot, by walking meandering transects, with additional attention given to potentially suitable habitat (wetlands). The plant species detected during the field surveys were identified to subspecies or variety, if applicable and feasible. Detected species that could not be identified to subspecies or variety were limited to species that do not have a subspecies or variety that is special status.

Scientific and common names for plant species with a CRPR follow the CNPS On-Line Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2018). For plant species without a CRPR, scientific names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2018), and common names follow the List of Vegetation Alliances and Associations (CDFW 2010) or the U.S. Department of Agriculture Natural Resources Conservation Service Plants Database (USDA 2018).

RESULTS

The study area is mostly developed and does not support suitable tidal salt marsh habitat for soft bird's-beak (Figure 3). Wetlands in the ponds at the southern edge of the study area were surveyed and no rare plants were observed. In addition, the saltmarsh flats to the south and east of the study area were also surveyed and no rare plants were observed.

Results of the survey for soft bird's-beak were negative. The survey was conducted when this species would be evident and identifiable; thus, this species does not occur in or within 100 feet of the study area. No suitable habitat for soft bird's-beak occurs within the study area. Consequently, Dudek does not recommend further surveys for this species.

REFERENCES

CNPS (California Native Plant Society). 2001. *CNPS Botanical Survey Guidelines*. December 9, 1983. Revised June 2, 2001.

CNPS (California Native Plant Society). 2018. Inventory of Rare and Endangered Plants (online ed., version 8-02). Sacramento, California: California Native Plant Society. Accessed July 2018. www.rareplants.cnps.org.

CDFW (California Department of Fish and Wildlife). 2018. "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities." March 20, 2018.

CDFW. 2010. *List of Vegetation Alliances and Associations: Natural Communities List Arranged Alphabetically by Life Form*. September 2010. Accessed August 2018. https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities/List.

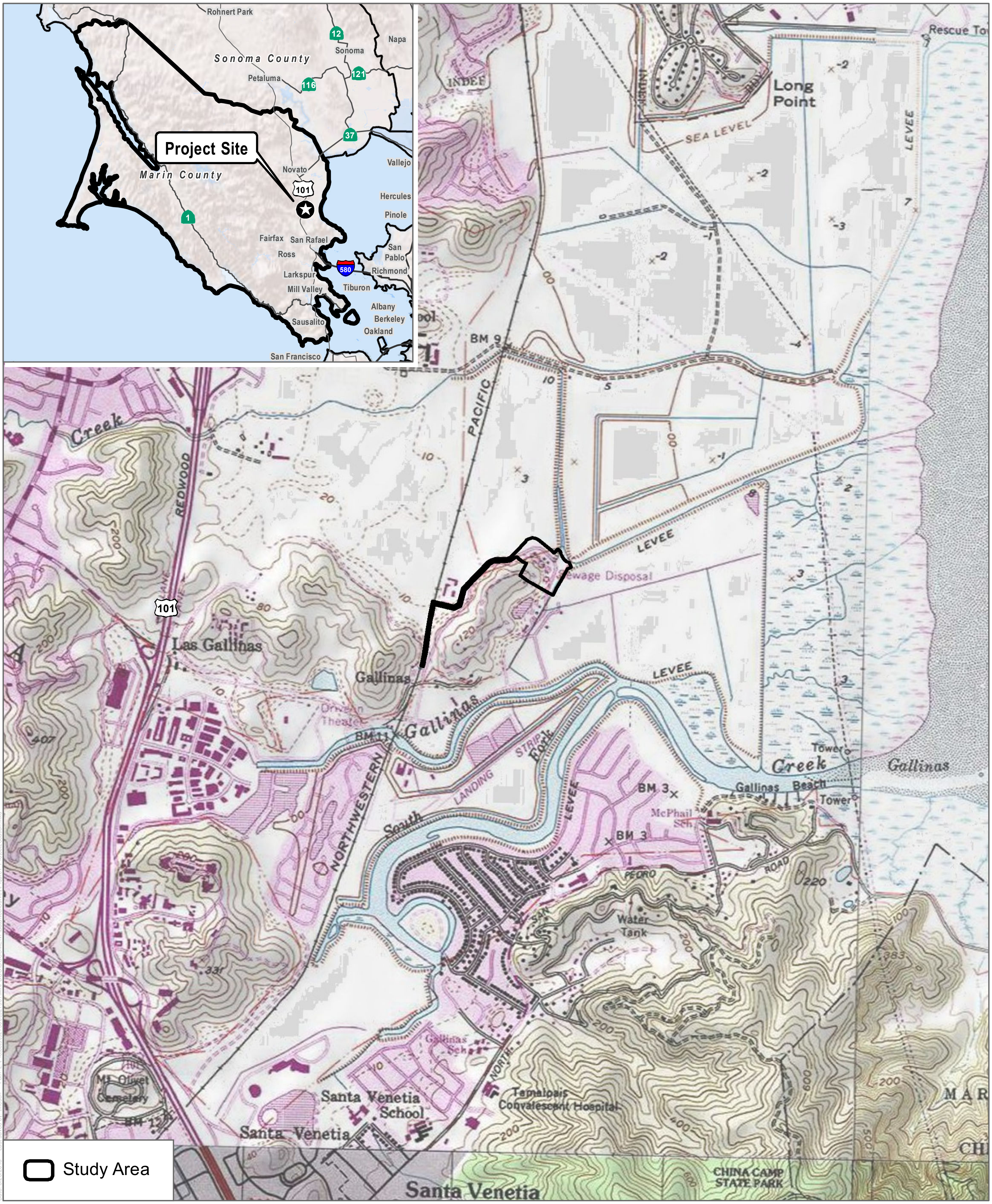
Cypher, E.A. 2002. "General Rare Plant Survey Guidelines." Bakersfield, California: California State University, Stanislaus, Endangered Species Recovery Program. Revised July 2002. http://www.fws.gov/sacramento/ES/Survey-Protocols-Guidelines/Documents/rare_plant_protocol.pdf.

Jepson Flora Project. 2018. Jepson eFlora. Berkeley, California: University of California. Accessed August 2018. http://ucjeps.berkeley.edu/interchange/index.html

USDA (U.S. Department of Agriculture). 2018. "California." State PLANTS Checklist. Accessed August 2018. http://plants.usda.gov/dl_state.html.

ATTACHMENT A

Figures 1-3



SOURCE: USHS 7.5 minute serise Novato quadrangle
Township 2N / Range 6W / Sections 9, 10

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Las Gallinas Valley Sanitary District - Botanical Surveys

SOURCE: Bing 2018, USDA 2007

DUDEK

0 125 250 Feet

FIGURE 2

Soils

Las Gallinas Valley Sanitary District - Botanical Surveys

SOURCE: Bing 2018

DUDEK

0 125 250 Feet

FIGURE 3

Land Covers and Vegetation Communities

Las Gallinas Valley Sanitary District - Botanical Surveys

ATTACHMENT B

List of Plant Species Observed

ATTACHMENT B
Plant Species Observed during the Las Gallinas Valley Botanical Survey for Soft Bird's-Beak

VASCULAR SPECIES

AIZOACEAE—Fig-marigold Family
Sesuvium verrucosum—western sea-purslane

ANACARDIACEAE—Sumac Or Cashew Family
Toxicodendron diversilobum—poison oak

APIACEAE—Carrot Family
Foeniculum vulgare—fennel*

ASTERACEAE—Sunflower Family
Baccharis pilularis—coyote brush
Carduus pycnocephalus—Italian plumeless thistle*
Centaurea solstitialis—yellow star-thistle*
Cichorium intybus—chicory*
Grindelia hirsutula—hairy gumweed
Helminthotheca echioides—bristly oxtongue*
Lactuca serriola—prickly lettuce*

BRASSICACEAE—Mustard Family
Brassica nigra—black mustard*

CARYOPHYLLACEAE—Pink Family
Spergula arvensis—corn spurry*

CHENOPODIACEAE—Goosefoot Family
Atriplex prostrata—fat hen*
Atriplex semibaccata—Australian saltbush*
Salicornia pacifica—pickleweed

EUPHORBIACEAE—Spurge Family
Euphorbia maculata—spotted sandmat*

FABACEAE—Legume Family
Vicia sativa—garden vetch*

FAGACEAE—Oak Family
Quercus agrifolia—coast live oak

GERANIACEAE—Geranium Family
Erodium botrys—longbeak stork's bill*

MYRTACEAE—Myrtle Family

Eucalyptus globulus—Tasmanian bluegum*

PLANTAGINACEAE—Plantain Family
Plantago coronopus—buckhorn plantain*

POLYGONACEAE—Buckwheat Family
Rumex crispus—curly dock*

ROSACEAE—Rose Family
Rubus armeniacus—Himalayan blackberry*

POACEAE—Grass Family
Bromus diandrus—ripgut brome*
Distichlis spicata—salt grass
Festuca myuros—rat-tail fescue*

TYPHACEAE—Cattail Family
Typha latifolia—broadleaf cattail

*Indicates non-native species