Draft Initial Study / Proposed Mitigated Negative Declaration

Rotary Manor Culvert Replacement Project

City of San Rafael, California

Prepared for:

City of San Rafael
Department of Public Works
111 Morphew Street
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1. Project Title: Rotary Manor Culvert Replacement Project

2. Lead Agency and Project Applicant: City of San Rafael
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111 Morphew Street
San Rafael, California 94901

3. Contact Person and Phone Number: Theo Sanchez
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Email: Theo.Sanchez@cityofsanrafael.org

4. Project Location: Southeast yard of the Rotary Manor property at 1821 Fifth Avenue in the City of San Rafael, Marin County, California (see Figures 1 and 2)

5. Surrounding Land Uses and Setting:

The proposed project is located at Assessor's Parcel Number (APN 010-291-71), in the southeast yard of Rotary Manor at 1821 Fifth Avenue in San Rafael, Marin County (Figures 1 and 2). Project plans involve replacement of the corroded corrugated metal pipe (CMP) culvert located at Rotary Manor, with a new reinforced concrete box (RCB) culvert. The project footprint is in the southeast yard of Rotary Manor, in the City of San Rafael. A small portion of the creek bed belongs to the neighboring property. The City would be requesting a temporary construction easement for this portion of the creek bed which is not usable by the property owner.

The zoning district designated for the project site is HR1.8 (Multifamily Residential District). The General Plan land use designation for the site is High Density Residential, and the land use designations in the project vicinity include Medium Density Residential to the north, west and east, and Residential Office and West End Village to the south and southeast.

Figure 1 Project Location Map

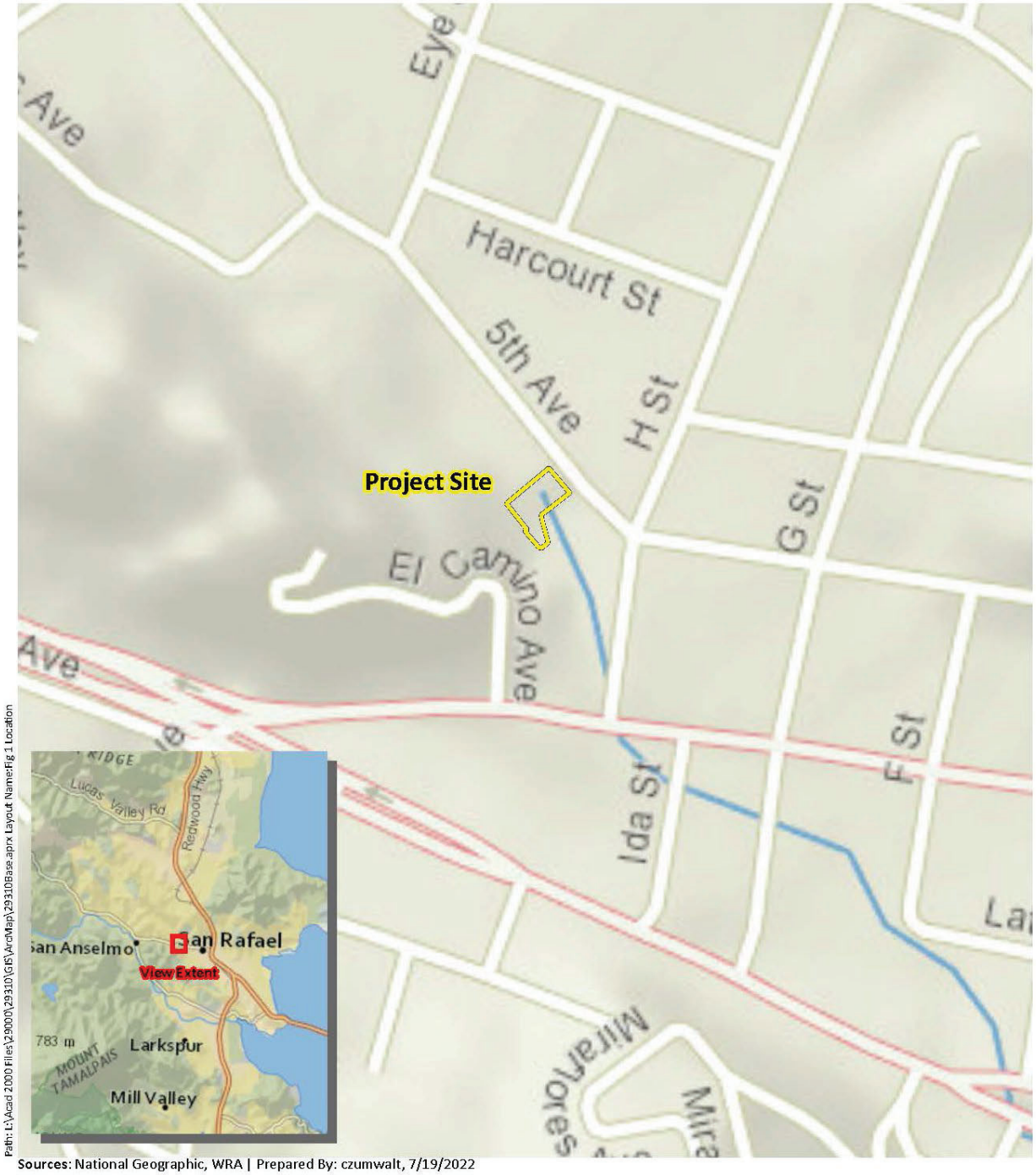
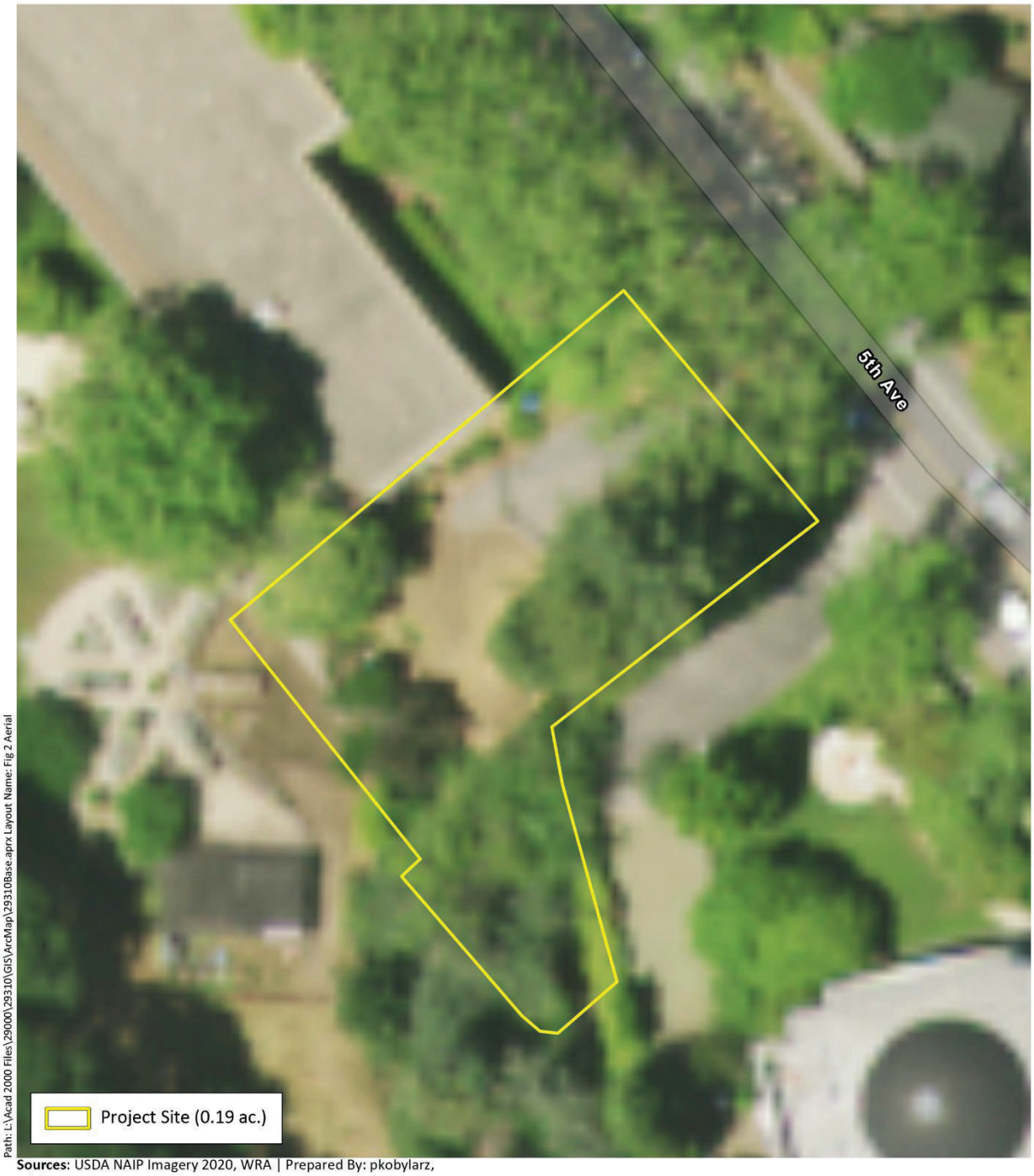


Figure 2 Aerial of Project Site



6. Existing System:

This existing CMP is approximately 10 feet wide by six (6) feet tall by approximately 50 feet long and comprises the end segment of an underground section of San Rafael Creek that passes through the Sun Valley neighborhood and under Fifth Avenue. Upstream of the pipe arch is an RCB culvert, approximately eight (8) feet wide by six (6) feet high, of unknown length. The pipe arch is connected to the downstream end of the RCB with cast-in-place concrete of unknown dimensions.

The bottom of the CMP culvert has completely corroded away (Figure 3), and the soil beneath the culvert has eroded to a depth of 12-18 inches for the entire length of the pipe. Water was observed in the eroded cavities below the pipe in the month of September of 2019, indicating that the creek has perennial flow.

The cause of the culvert failure at the flow line is likely due to metal corrosion exacerbated by abrasion and wear due to an active bedload of rock and gravel that has steadily scoured away the galvanized plating and rusting metal. Corrosion is not generally observed on the sidewalls and soffit of the pipe where there are no acting bedload forces.

The missing pipe floor has created a pathway for groundwater and soil to move around and out of the corroded opening of the culvert floor, creating voids in the soil surrounding the pipe. Stress fractures are visible at the spring line of pipe, another indication that the soil above and around the pipe have partially eroded away and is not fully supporting the pipe. At midspan, the pipe has sagged approximately 1.6 feet in profile.

At the downstream limits of the pipe arch is a concrete endwall, roughly 20 feet high and 30 feet across, and which upon visual inspection, appears to be in good condition. Downstream of the endwall, shown in Figure 3, San Rafael Creek daylights as an open creek.

As shown in Figure 3, a cone-shaped sinkhole currently exists in the southeast yard of Rotary Manor, over the connection point of the RCB and CMP culverts, with an approximate top width diameter of 20-25 feet and depth of eight (8) feet. The concrete connecting the two culverts is partially observable in the bottom of the hole. From within the culvert, separation exists between the two culverts approximately three (3) inches wide at the soffit, and light can be seen through the hole down in the culvert.

Also observable in the hole over the CMP culvert is a 12-inch diameter asbestos-cement storm drain pipe with a new repair band. The storm drain pipe is shallower than the culvert but in a parallel alignment.

Access to the southeast yard of Rotary Manor is currently controlled by temporary construction fencing due to the open hole in the yard. The yard is currently covered in lawn with landscaped areas near the buildings and the fence line. A nearby trellis has been undermined and partially collapsed.

Figure 3 Photographs of Existing Conditions

Upstream view of the arch CMP culvert showing the corroded floor and bowed flow line.

View of the enddwall and open channel downstream of the CMP culvert.

View of hole in the southeast yard of Rotary Manor. The 12-inch diameter drain pipe is visible in the hole.

7. Project Design Alternatives:

Three alternatives for the proposed culvert repair/replacement were evaluated in the Alternative Analysis Study during the project design phase, including Alternative 1: Repair the CMP Culvert, Alternative 2: Construct RCB Culvert, and Alternative 3: Construct RCB Culvert and Channel. [1]

Alternative 1 would involve repairing the existing CMP culvert in place while maintaining the existing endwall and downstream channel. Alternative 2 would involve removing the existing CMP culvert and replacing it with a new RCB culvert, while performing only minor modifications to the existing endwall and protecting the downstream channel in place. Alternative 3 would involve removing the existing CMP culvert and endwall and replacing it with a new RCB culvert, endwall, and 10 linear feet of rock-lined open channel.

The three culvert alternatives were evaluated and rated against each of the design criteria including service life, hydraulic capacity, constructability, environmental compliance, construction cost and restored property. Alternative 2 was recommended for the proposed culvert repair/replacement because it provides the best repair solution according to the identified design criteria by providing a durable culvert solution with increased hydraulic capacity, no major constructability issues, moderate environmental compliance issues, moderate construction cost, as well as restoration of Rotary Manor property to its previous condition.

8. Project Description:

Project Elements

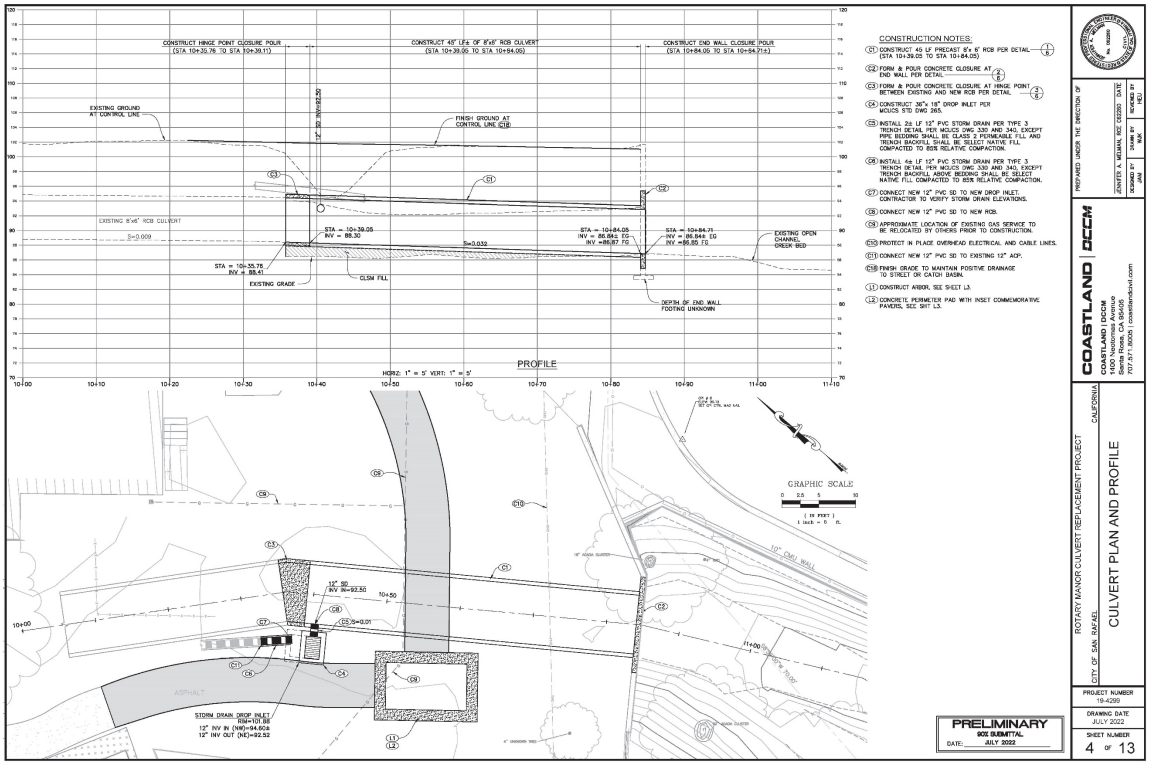
The proposed project involves removing the existing CMP culvert and replacing it with a new RCB culvert, while performing only minor modifications to the existing endwall and protecting the downstream channel in place. The project plan is shown in Figure 4. The project would include the following elements:

- Relocate an underground Pacific Gas and Electric (PG&E) gas pipeline;
- Divert and/or bypass pump surface and groundwater around the project site;
- Sawcut and partially demolish the existing downstream endwall;
- Remove the existing CMP culvert;
- Brace and shore the trench excavation as needed;
- Install an approximately 45 linear feet of eight (8) feet by six (6) feet RCB culvert;
- Form and pour concrete closure at hinge point interface between existing and new RCB culverts;
- Form and pour concrete to connect new RCB to existing endwall;
- Backfill culvert trench with concrete slurry (CDF) up to 12 inches above the RCB culvert;

[1] *Coastland. June 12, 2020. Rotary Manor Culvert Replacement Alternative Analysis Study (Revised)*

- Backfill culvert trench above CDF backfill and up to 18 inches below finish grade with native paved backfill material, compacted to 90 percent relative compaction;
- Backfill upper 18 inches of culvert trench with planting soil, compacted to 85 percent relative compaction;
- Partially remove/abandon 12-inch diameter asbestos-cement drain pipe. Reroute drain through hinge point closure pour with PVC pipe;
- Install landscaping and irrigation system in the restored southeast yard; and,
- Rebuild existing trellis.

Figure 4 Culvert Plan and Profile



Source: Coastland DCCM. July 2022. Project Plans for Rotary Manor Culvert Replacement Project,

Construction

Overview

Construction of the proposed project would last for approximately 3.5 months. Construction equipment is anticipated to include a crane, excavator, loader and compaction equipment. The total footprint of all permanent and temporary impacts from the culvert replacement, as well as construction access and staging, is approximately 6,960 square feet.

Utility Relocation

Prior to commencement of construction, a PG&E underground gas service pipeline that crosses the excavation area would be relocated permanently. The location of the gas pipeline is shown in Figure 4.

Staging and Assess

Staging area for the proposed project would be provided on-site. A City-owned yard may be available for equipment, vehicles, and materials staging. The proposed project would require the yard to be excavated thereby limiting undisturbed area that can be used for staging. Site access would be provided by Fifth Avenue (Figure 1).

At least one week prior to the commencement of work, the contractor would provide project information signs to notify drivers of the upcoming project and potential traffic delays. Additionally, the City or its contractor would notify and coordinate with law enforcement and emergency service providers prior to the start of construction to ensure minimal disruption to service during construction.

Dewatering

Stormwater is anticipated to be flowing through the existing culvert system at the time of construction. Groundwater is anticipated to be encountered at depths 12 feet below existing grade. The contractor would furnish, install and maintain a dewatering system(s) to divert all flow from the upstream culvert around the construction area as well as to remove all accumulated water (groundwater or other) from excavation areas as required to complete the proposed project. The dewatering work would include obtaining all necessary permits.

<u>Dewatering of Stormwater by Passive or Pumped Diversion</u>

Stormwater from the upstream culvert may be captured via coffer dams or other approved means and diverted around the construction area via gravity pipes or pumped systems.

The contractor would be responsible to verify existing flow in the culvert and design an appropriately-sized dewatering system. The dewatering system would operate 24 hours per day until construction of the box culvert is completed. The contractor would be responsible to monitor and maintain the dewatering system for its entire operation.

<u>Dewatering of Groundwater</u>

The contractor would remove groundwater from excavations areas through the use of well points or other approved means.

The contractor would discharge collected groundwater to contractor-supplied holding tank(s) prior to discharging. Discharge from holding tank may be either through gravity or by pressure by maintaining a transfer pump. The discharge would be directed through a particulate/sediment filter and a flow totalizer prior to discharge. All groundwater would be discharged to the sanitary sewer under an approved permit from the City of San Rafael.

Permits

The contractor would obtain permits from the City of San Rafael for discharge of groundwater to the existing sanitary sewer system. Comply with all sampling, discharge flow and daily volume requirements.

Submittals

The contractor would prepare a Dewatering Plan for discharge to the sewer. The Dewatering Plan would include the following:

1. A dewatering plan for all open cut trenching, include all necessary permits.
2. Dewatering system layout, dam dimensions, dewatering pump locations, pipe sizes and capacities, particulate/sediment filter specifications, surface water control devices, and water disposal method and location.
3. Primary and standby power system location and capacity. For pumps operating by fuel, indicate location, storage and amount of fuel contained at the site.
4. Detailed description of dewatering and monitoring system installation procedures

Grading

The project would include excavating 280 cubic yards (CY) of soil and require 220 CY of fill. Approximately 100 CY of the cut soil would be used as native fill and 180 CY of the remaining cut soil would be exported off-site. The project would import approximately 120 CY of soil for filling.

Parking

Construction of the proposed project would not use on-street parking. The proposed project would provide new asphalt pavement to increase parking at Rotary Manor. Construction vehicles would park in the staging area.

Traffic

Traffic control would conform to the California Manual on Uniform Traffic Control Devices (CAMUTCD), as well as City standard specifications. A single lane closure is expected during work hours. The contractor would install advance warning signs to alert pedestrians and bicyclists of the work zone. Advance warning signs may be reflective signs, changeable message boards, cones, and/or barricades. The work would be limited to 7:00 A.M. to 5:00 P.M., Monday through Friday,

unless otherwise approved in writing by the Director of Public Works. Work on Saturdays between 7:00 A.M. to 5:00 P.M. may be necessary to complete the project before any nesting season begins.

Tree Loss

The project has been designed to avoid tree loss and tree trimming to the maximum degree possible. The project would remove one (1) tree. Standard avoidance and minimization measures would be implemented to ensure the project complies with all applicable City regulations regarding tree removal.

Operation and Maintenance

Service Life

The Service Life design criterium assesses the durability of the proposed project with the goal being a service life of at least 50 years. Service lives of culverts are affected by many factors, including freeze/thaw cycles, weathering, abrasion, acids, sulfates and chlorides. Weathering and abrasion are the chief factors affecting the service life of drainage structures in non-marine creek environments. In 1982, the Ohio Department of Transportation published a major report on the results of a ten-year study of more than 1,600 culverts in all areas of the state. The study found that precast concrete culverts having a bed slope of 1.5% had a service life of 100 – 1,000 years, where the 100-year service life represented chemically-aggressive soil conditions (pH = 4) and 1,000 years represented chemically-neutral soil conditions (pH = 7). The Alternatives Analysis Study conservatively gave the proposed project an expected service life rating of over 50 years.

Hydraulic Capacity

The Hydraulic Capacity design criterium was to maintain the approximate flow capacity of the upstream RCB culvert through the repaired/replaced culvert reach. The upstream 8'x6' RCB has a slope of 0.9% and an estimated roughness of 0.013, which generates a full-flow capacity of 1,055 cubic feet per second (cfs) using Manning's equation. The proposed project consists of a new RCB which would be installed with the exact width and height of the upstream structure, and with a steeper slope of 3.2%. The new RCB's full-flow capacity is 1,760 cfs, which is 67% higher than the upstream structure. The increased flow capacity is due to the much steeper slope of the new RCB culvert compared to the upstream RCB culvert.

Project Measures

Construction Basic Measures

The Bay Area Air Quality Management District (BAAQMD) recommends basic construction measures to ensure minimal impacts on regional air quality. The contractor would be responsible for implementing the following basic measures during construction:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas) will be watered two times per day.

- All haul trucks transporting soil, sand, or other loose material off-site will be covered.
- All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations).
- Clear signage will be provided for construction workers at all access points.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer 's specifications, and all equipment will be checked by a certified visible emissions evaluator.
- A publicly visible sign with the telephone number and person to contact at the lead agency regarding any dust complaints will be posted in or near the project site. The contact person will respond to complaints and take corrective action within 48 hours. The Air District's phone number will also be visible to ensure compliance with applicable regulations.

Creek Bed Protection Measures

- "Creek" is defined as the channel downstream of the culvert end wall within the top of banks.
- "Creek bed" is defined as the floor of the channel, not including the banks.
- Construction in the creek will be limited to the Creek Bed Construction Zone, which is the creek bed within 20 feet of the culvert end wall. Construction activities will not be conducted from any other part of the creek, including the banks within 20 feet of the end wall.
- Contractor will dewater the Creek bed Construction Zone prior to initiating any construction activities.
- Contractor will conduct all construction activities in a way that prevents fine sediment from dropping into the creek. This will require the placement of best management practices (BMPs) around the work area and silt fence at the cofferdam to create the 20-foot construction zone.
- Contractor must prevent any contact between cementitious materials (concrete, concrete culvert, control density fill, etc.) that has not cured for a minimum of 30 days.
- Contractor will construct a silt fence across the creek at a distance 20 feet from the culvert end wall.
- The creek bed within the Creek Bed Construction Zone will be overlaid and pined (with 20-inch minimum overlap) with a heavy-duty nonwoven geotextile suitable for separation of fine sediment (Mirafi 1100N or approved equivalent). Any geotextile ripped or damaged during construction will be immediately repaired or replaced.

- A temporary sandbag cofferdam will be constructed directly downstream of the silt fence. Sediment-free water from dewatering operations and bypass flows will be returned to the creek at this point.
- No re-fueling or maintenance of equipment will be conducted within the creek.
- Construction access to the creek bed will be via the existing footpath and limited to a 6-foot width. No heavy equipment will be operated form the creek bed. Tools, materials, and construction debris may be hoisted up and down the creed bed from the top of the end wall.
- At the end of construction, the silt fence, cofferdam, geotextile fabric, construction materials and all construction debris will be carefully removed to avoid any deposits of fine sediment in the creek.

9. Other Public Agencies Whose Approval May Be Required:

The information contained in this Initial Study will be used by the City of San Rafael (the California Environmental Quality Act [CEQA] Lead Agency) as it considers whether or not to approve the proposed project. If the project is approved, the Initial Study, as well as the associated Mitigated Negative Declaration (MND) would be used by the City and responsible and trustee agencies in conjunction with various approvals and permits. The project would require temporary fill of the creek from equipment and materials. These actions may require, but not be limited to, the following approvals by the agencies indicated:

City of San Rafael

- City Council Approval
- Grading Permit

California Department of Fish and Wildlife (CDFW)

- Section 1602, Lake and Streambed Alternation Agreement

U.S. Army Corps of Engineers (Corps)

- Clean Water Act, Section 404 Discharge into Waters of the U.S.

San Francisco Regional Water Quality Control Board (SFRWQCB)

- Clean Water Act, Section 401 Water Quality Certification

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is potentially significant unless mitigation is incorporated, as indicated by the checklist on the following pages.

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

Determination:

On the basis of this initial evaluation:

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

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

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

☐ I find that the 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 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, nothing further is required.

Signature: Raed Al-Zaher Date: 10/20/2022

Name/Title: Raed Al-Zaher, Project Manager, City of San Rafael Department of Public Works

INITIAL STUDY CHECKLIST

This section describes the existing environmental conditions in and near the project area and evaluates environmental impacts associated with the proposed project. The environmental checklist, as recommended in the CEQA Guidelines (Appendix G), was used to identify environmental impacts that could occur if the proposed project is implemented. The right-hand column in the checklist lists the source(s) for the answer to each question. The cited sources are identified at the end of this section.

Each of the environmental categories was fully evaluated, and one of the following four determinations was made for each checklist question:

- **"No Impact"** means that no impacts to the resource would occur as a result of implementing the project.
- **"Less than Significant Impact"** means that implementation of the project would not result in a substantial and/or adverse change to the resource, and no mitigation measures are required.
- **"Less than Significant with Mitigation Incorporated"** means that the incorporation of one or more mitigation measures is necessary to reduce the impact from potentially significant to less than significant.
- **"Potentially Significant Impact"** means that there is either substantial evidence that a project-related effect may be significant, or due to a lack of existing information, could have the potential to be significant.

I.	**AESTHETICS** — Except as provided in Public Resources Code Section 21099, would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Environmental Setting

There are no designated scenic highways in Marin County. However, portions of Highway 101, State Route 1 (SR 1), and State Route 37 (SR 37) are eligible for listing.[2] The project site is not located along any eligible portion of these highways, which are located roughly one mile to the east (Highway 101) and more than nine miles north (Highway 101 and SR-37) of the project site. The San Rafael General Plan Community Design Element, Policy CD-5 states, "Respect and enhance to the greatest extent possible, views of the Bay and its islands, Bay Wetlands, St. Raphael's church bell tower, Canalfront, marinas, Mt. Tamalpais, Marin Civic Center and hills and ridgelines from public streets, parks and publicly accessible pathways." The proposed project site does not consist of, nor would it block, one of these City-designated scenic views.

[2] *California Department of Transportation, "List of Officially Designated County Scenic Highways," Available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed May 27, 2022.*

Existing land uses adjacent to the project site consist of light industry, commercial, and residential uses. Views of the site from the surrounding residential neighborhood are mostly screened by vegetation, and the distance is too great for clear views of the low-lying culvert. Motorists are not able to view the project site, as views from any major road are blocked by buildings. Existing sources of nighttime light in the project area include vehicle headlights, commercial development lighting, parking lot lights and residential security lighting. Existing sources of glare are mainly limited to automobile windshields and reflective building materials associated with residential and commercial uses.

Discussion of Impacts

a, b) ***No Impact.*** No scenic vistas exist in or near the project site. Furthermore, there is no State or locally designated scenic highway, road or corridor within the vicinity of the project site. The project would require removal one (1) tree within Rotary Manor. Removal of a tree within a private property would not result in impact to scenic resources. The project also would not result in impacts within a State Scenic Highway.

c) ***Less than Significant Impact.*** There is the potential for temporary impacts to the existing visual quality of the surrounding area during construction. There are no views of the project site from public recreational areas. Temporary visual impacts could therefore result from the presence of construction vehicles or ground disturbance during project construction activities. However, construction activities would be temporary (approximately 3.5 months). The permanent development of the site would be consistent with the existing conditions of the site, as the new culvert would replace the existing culvert. The proposed project site does not consist of, nor would it block, any of the City-designated scenic views as described in the San Rafael General Plan. Impacts would be less than significant.

d) ***No Impact.*** Construction of the proposed project would not create a significant source of light or glare during daytime. The long-term operation of the project would not result in the addition of new sources of light and glare. Upon completion of construction the light and glare conditions at the project site would be nearly identical to existing conditions. The proposed project would not create a new source of substantial light or glare which adversely affect day or nighttime views in the area. No impact would occur.

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

Environmental Setting

The project site is located on land classified as Urban and Built-Up Land and does not contain any farmland or forestry land and is not designated for agricultural or forestry uses or Prime, Statewide, or Locally Important Farmland.[3] The proposed project is located in residential and commercial areas. Surrounding land is developed with residential, commercial, light industrial, and conservation uses.

Discussion of Impacts

a-e) ***No Impact.*** There are no agricultural or forestry resources within the project site. There are no Prime, Unique, Statewide or Locally Important farmlands in the area. The project site is not under a Williamson Act Contract, nor is the project zoned as forest land or timber production. The project would be confined entirely within Rotary Manor, a private property that has been developed. No impacts to agricultural or forestry resources would occur.

[3] *California Department of Conservation. California Important Farmland Finder. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed May 27, 2022.*

III.	**AIR QUALITY** — Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant*	*No Impact*
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d)	Result in other emissions (such as those leading to odors) affecting a substantial number of people?	☐	☐	☒	☐

Environmental Setting

The project site is in the San Francisco Bay Area Air Basin, where air quality is monitored and regulated by the Bay Area Air Quality Management District (BAAQMD). Ambient concentrations of key air pollutants have decreased considerably over the course of the last several decades. Air pollution is generated by anything that burns fuel (including but not limited to cars and trucks, construction equipment, backup generators, boilers and hot water heaters, barbeques and broilers, gas-fired cooking ranges and ovens, fireplaces, and wood-burning stoves), almost any evaporative emissions (including the evaporation of gasoline from service stations and vehicles, emissions from food as it is cooked, emissions from paints, cleaning solvents, and adhesives, etc.), and other processes (fugitive dust generated from roadways and construction activities, etc.).

A sensitive receptor is generally defined as a location where human populations, especially children, seniors, and sick persons are located where there is a reasonable expectation of continuous human exposure to air pollutants. These typically include residences, hospitals, and schools. The site is surrounded by residential, commercial, and light industrial land uses.

The Bay Area is currently classified as "attainment" or "unclassifiable" with respect to every National Ambient Air Quality Standard (NAAQS) except ozone and fine particulate matter $PM_{2.5}$, for which it is still classified as "nonattainment." Ozone concentrations in the Bay Area have also decreased considerably over the last several decades, but NAAQS are required to be set to be protective of public health "allowing an adequate margin of safety" and have also become more stringent. Prior to 2008, attaining the ozone NAAQS required that the "design value" --i.e., the peak

8-hour average concentration on the 4th-worst day of the year (averaged over three consecutive years) --be below 0.08 parts per million (ppm); the Bay Area was classified as "marginal" nonattainment with respect to that standard.[4] In 2008, the ozone NAAQS was revised to 0.075 ppm. Therefore, while EPA has not yet finalized its attainment designations for the 2008 ozone standard, it is proposing to designate the Bay Area as "marginal nonattainment" (0.076 - 0.086 ppm) with respect to that standard.[5]

The State of California also has its own ambient air quality standards (CAAQS) which are equivalent to or more stringent than the NAAQS; the Bay Area is currently classified as nonattainment with respect to the CAAQS for ozone, particulate matter smaller than 10 microns (PM_{10}), and "fine" particulate matter smaller than 2.5 microns ($PM_{2.5}$).

Discussion of Impacts

a) ***Less Than Significant Impact.*** Construction activities would result in short-term increases in emissions from the use of heavy equipment that generates dust, exhaust, and tire-wear emissions; soil disturbance; materials used in construction; and construction traffic. Project construction would produce fugitive dust (PM_{10} and $PM_{2.5}$) during ground disturbance and would generate carbon monoxide, ozone precursors, and other emissions from vehicle and equipment operation. BAAQMD released a Clean Air Plan for the Bay Area in 2017, which would be the applicable air quality plan for the proposed project. BMPs recommended by BAAQMD and identified above in the project description would be implemented during construction to minimize fugitive dust. Construction activities would mainly take place within an existing developed footprint. Construction emissions would be temporary, lasting approximately 3.5 months, and would not have long-term effects on air quality in the Bay Area. Because of the small area of disturbance, temporary nature of the emissions, and implementation of construction measures, impacts on air quality would be less than significant and would comply with the Bay Area 2017 Clean Air Plan.

b) ***Less Than Significant Impact.*** As discussed under item a), the project would result in minor construction-related emissions. It would not result in a cumulatively considerable net increase of any criteria pollutant. The project would result in short-term air quality impacts as a result of construction activities; however, it would not result in long-term or cumulatively considerable increases in air quality pollutant emissions for which the Bay Area is currently in non-attainment (ozone and particulate matter). Implementation of the BAAQMD BMPs listed in the Project Description would ensure that the temporary increase in

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[4] The Bay Area Air Quality Management reported that the maximum 8-hour ozone concentration only exceeded the standard once in 2005 and once in 2007 but exceeded the standard on 12 days in 2006.

[5] EPA's proposed criterion for the "marginal" classification was proposed in the Federal Register on February 14, 2012.

air pollutant emissions associated with construction activities would result in less than significant contributions to cumulative pollutant levels in the region.

c) ***Less Than Significant Impact.*** The project site is located at Rotary Manor which is a private property for senior housing. Residents living in Rotary Manor are the closest sensitive receptors to the project. Other sensitive receptors in the vicinity are residents and shoppers, which may include children, elderly people, or people with respiratory illnesses. Sensitive receptors located in close proximity to several locations adjacent to the construction area could be exposed to temporary air pollutants from construction activities, such as fugitive dust, ozone precursors, and carbon monoxide. The duration of construction activities would be limited. Basic construction measures recommended by BAAQMD would be implemented during construction to minimize air pollutants. New construction equipment has been subject to increasingly stringent emissions requirements at the Federal level (e.g., 40 CFR 89 and 1039), designated "Tier 1", "Tier 2", "Tier 3", etc.; older construction equipment is subject to potential retrofit requirements required by the State of California (13 CCR 2449, 13 CCR 2450-2466, and 17 CCR 93116). As a result, sensitive receptors in the vicinity of the project would not be exposed to substantial pollutant concentrations, and impacts would be less than significant.

d) ***Less Than Significant Impact.*** Construction activities would involve the use of gasoline or diesel-powered equipment that emits exhaust fumes. These activities would take place intermittently throughout the workday, and the associated odors are expected to dissipate within the immediate vicinity of the work area. Persons near the construction work area may find these odors objectionable. However, the proposed project would not include uses that have been identified by BAAQMD as potential sources of objectionable odors, such as restaurants, manufacturing plants, landfills, and agricultural and industrial operations.[6] The infrequency of the emissions, rapid dissipation of the exhaust and other odors into the air, and short-term nature of the construction activities would result in less-than-significant odor impacts.

[6] *Bay Area Air Quality Management District. 2017. California Environmental Quality Act Air Quality Guidelines. Available at:<https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en> Accessed on: June 19, 2020*

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

Regulatory Setting

Sensitive Natural Communities

Sensitive natural communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies,

regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database.[7,8] Vegetation alliances are ranked 1 through 5 in the CNDDB based on NatureServe's methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). In addition, this general class includes oak woodlands that are protected by local ordinances under the Oak Woodlands Protection Act and Section 21083.4 of California Public Resources Code.

Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates "Waters of the United States" under Section 404 of the Clean Water Act. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *U.S. Army Corps of Engineers Wetlands Delineation Manual*, are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Unvegetated waters including lakes, rivers, and streams may also be subject to Section 404 jurisdiction and are characterized by an ordinary high water mark (OHWM) identified based on field indicators such as the lack of vegetation, sorting of sediments, and other indicators of flowing or standing water. The placement of fill material into Waters of the United States generally requires a permit from the Corps under Section 404 of the CWA.

Waters of the State

The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of

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[7] *California Department of Fish and Wildlife. 2022 Sensitive Natural Communities. Available at <https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities> Accessed on June 19, 2022.*

[8] *California Department of Fish and Wildlife. 2022. California Natural Diversity Database. Biogeographic Data Branch, Vegetation Classification and Mapping Program, Sacramento, California. CDFW. Available at <https://apps.wildlife.ca.gov/myaccount/login?ReturnUrl=%2frarefind%2fview%2fRareFind.aspx> Accessed on June 19, 2022.*

the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Special-status Species

Endangered and Threatened Plants, Fish, and Wildlife. Specific species of plants, fish, and wildlife species may be designated as threatened or endangered by the federal Endangered Species Act (ESA), or the California Endangered Species Act (CESA). Specific protections and permitting mechanisms for these species differ under each of these acts, and a species' designation under one law does not automatically provide protection under the other.

The ESA (16 USC 1531 et seq.) is implemented by the USFWS and the National Marine Fisheries Service (NMFS). The USFWS and NMFS maintain lists of endangered and threatened plant and animal species (referred to as "listed species"). "Proposed" or "candidate" species are those that are being considered for listing and are not protected until they are formally listed as threatened or endangered. Under the ESA, authorization must be obtained from the USFWS or NMFS prior to take of any listed species. "Take" under the ESA is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Take under the ESA includes direct injury or mortality to individuals, disruptions in normal behavioral patterns resulting from factors such as noise and visual disturbance, and impacts to habitat for listed species. Actions that may result in take of an ESA-listed species may obtain a permit under ESA Section 10, or via the interagency consultation described in ESA Section 7. Federally listed plant species are only protected when take occurs on federal land.

The ESA also provides for designation of critical habitat, which are specific geographic areas containing physical or biological features "essential to the conservation of the species." Protections afforded to designated critical habitat apply only to actions that are funded, permitted, or carried out by federal agencies. Critical habitat designations do not affect activities by private landowners if there is no other federal agency involvement.

The CESA (CFGC 2050 et seq.) prohibits the take of any plant and animal species that the CFGC determines to be an endangered or threatened species in California. CESA regulations include take protection for threatened and endangered plants on private lands, as well as extending this protection to candidate species that are proposed for listing as threatened or endangered under CESA. The definition of a "take" under CESA ("hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") only applies to direct impact to individuals, and does not extend to habitat impacts or harassment. CDFW may issue an Incidental Take Permit under CESA to authorize take if it is incidental to otherwise lawful activity and if specific criteria are met. Take

of these species is also authorized if the geographic area is covered by a Natural Community Conservation Plan (NCCP), as long as the NCCP covers that activity.

Fully Protected Species and Designated Rare Plant Species. This category includes specific plant and wildlife species that are designated in the CFGC as protected even if not listed under CESA or ESA. Fully Protected Species includes specific lists of birds, mammals, reptiles, amphibians, and fish designated in CFGC. Fully protected species may not be taken or possessed at any time. No licenses or permits may be issued for take of fully protected species, except for necessary scientific research and conservation purposes. The definition of "take" is the same under the California Fish and Game Code and the CESA. By law, CDFW may not issue an Incidental Take Permit for Fully Protected Species. Under the California Native Plant Protection Act (NPPA), CDFW has listed 64 “rare” or “endangered” plant species, and prevents “take”, with few exceptions, of these species. CDFW may authorize take of species protected by the NPPA through the Incidental Take Permit process, or under a NCCP.

Special Protections for Nesting Birds and Bats. The federal Bald and Golden Eagle Protection Act provides relatively broad protections to both of North America’s eagle species (bald eagle [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*)] that in some regards are similar to those provided by the ESA. In addition to regulations for special-status species, most native birds in the United States, including non-status species, have baseline legal protections under the Migratory Bird Treaty Act of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, the intentional harm or collection of adult birds as well as the intentional collection or destruction of active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium-high priority are typically given special consideration under CEQA.

Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act provides for conservation and management of fishery resources in the U.S., administered by NMFS. This Act establishes a national program intended to prevent overfishing, rebuild overfished stocks, ensure conservation, and facilitate long-term protection through the establishment of Essential Fish Habitat (EFH). EFH consists of aquatic areas that contain habitat essential to the long-term survival and health of fisheries, which may include the water column, certain bottom types, vegetation (e.g., eelgrass (*Zostera* spp.)), or complex structures such as oyster beds. Any federal agency that authorizes, funds, or undertakes action that may adversely affect EFH is required to consult with NMFS.

Species of Special Concern, Movement Corridors, and Other Special-status Species under CEQA. To address additional species protections afforded under CEQA, CDFW has developed a list of special species as “a general term that refers to all of the taxa the CNDDB is interested in tracking, regardless of their legal or protection status.” This list includes lists developed by other organizations, including for example, the Audubon Watch List Species, the Bureau of Land Management Sensitive Species, and USFWS Birds of Special Concern. Plant species on the California

Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (Inventory) with California Rare Plant Ranks (Rank) of 1 and 2, as well as some with a Rank of 3, are also considered special-status plant species and must be considered under CEQA. Some Rank 3 species and all Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare. Additionally, any species listed as sensitive within local plans, policies and ordinances are likewise considered sensitive. Movement and migratory corridors for native wildlife (including aquatic corridors) as well as wildlife nursery sites are given special consideration under CEQA.

Environmental Setting

Biological Sensitive Communities

Sensitive natural communities identified within the project site include approximately 0.02 acre of mixed riparian woodland and 0.01 acre of intermittent stream (Figure 5).

Special-status Species

The following plant and wildlife agency databases were reviewed to determine the potential for special-status species to occur within a 5-mile radius of the project site:

- CDFW Wildlife Natural Diversity Database[9]
- USFWS Information for Planning and Conservation Database[10]
- USFWS Threatened and Endangered Species List[11]
- California Native Plant Society Electronic Inventory of Rare and Endangered Plants[12]
- Consortium California of Herbaria 2[13]
- USGS 7.5-Minute Topographic Quadrangles[14]

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[9] *California Department of Fish and Wildlife. 2022. California Natural Diversity Database. Biogeographic Data Branch, Vegetation Classification and Mapping Program, Sacramento, California.*

[10] *U.S. Fish and Wildlife Service (USFWS). 2022. Information for Planning and Consultation Database (IPaC). Available online at: https://ecos.fws.gov/ipac/*

[11] *U.S. Fish and Wildlife Service (USFWS). 2022. List of Federal Endangered and Threatened Species. Available online at: https://ecos.fws.gov/ipac/.*

[12] *California Native Plant Society (CNPS). 2022. A Manual of California Vegetation, Online Edition. Available online at: http://vegetation.cnps.org.*

[13] *Consortium of California Herbaria 2. 2022. Specimen data from the Consortium of California Herbaria. Available online at: https://www.cch2.org/portal/.*

[14] *U.S. Geological Survey. 2022. San Rafael Quadrangle, California. 7.5-minute topographic map.*

- Historical and current satellite imagery form Google Earth[15]
- Historic aerials

A total of 112 special-status plant species were documented to occur within 5 miles of the project site. All 112 documented plant species either have no potential or are unlikely to occur due to the following reasons:

- Habitat on and adjacent to the project site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- Few of the habitat components meeting the species requirements are present, and/or the majority of the habitat on and adjacent to the project site is unsuitable or of very poor quality.

A total of 40 special-status wildlife species have been documented to occur within a 5-mile radius to the project site. Of the 40 documented wildlife species, 38 species either have no potential or are unlikely to occur due to the following reasons:

- Habitat on and adjacent to the project site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- Few of the habitat components meeting the species requirements are present, and/or the majority of the habitat on and adjacent to the project site is unsuitable or of very poor quality.

Two (2) special-wildlife species, white-tailed kite (*Elanus leucurus*) and western pond turtle (*Emys marmorata*) have moderate potential to occur within a 5-mile radius of the project site because the presence of suitable nesting habitat and aquatic habitat, respectively.

Table 1 summarizes the special-status species' potential to occur within a 5-mile radius of the project site.

Aquatic Resources

San Rafael Creek is an intermittent stream which flows into a culvert in the project area. Within the project area, San Rafael Creek flows through the existing culvert and does not support riparian vegetation. According to the National Wetlands Inventory mapper, there are no wetlands located in the vicinity of the project site.[16]

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[15] *Google Earth. 2022. Aerial Imagery 1993-2022. Most recently accessed: June 2022.*

[16] *USFWS. National Wetlands Inventory Mapper. Available at: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed June 28, 2022.*

Figure 5 Biological Communities within Project Site

Table 1. Special-status Species with Potential to Occur within 5 Miles of the Project Site

Name	Status	Habitat	Occurrence Potential
Plants			
Sonoma alopecurus *Alopecurus aequalis var. sonomensis*	FE, Rank 1B.1	Marshes and swamps, riparian scrub. Elevation ranges from 15 to 1200 feet (5 to 365 meters). Blooms May-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
Napa false indigo *Amorpha californica var. napensis*	Rank 1B.2	Broadleafed upland forest, chaparral, cismontane woodland. Elevation ranges from 165 to 6560 feet (50 to 2000 meters). Blooms Apr-Jul.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is 2 miles southwest and is separated by extensive urban development.
bent-flowered fiddleneck *Amsinckia lunaris*	Rank 1B.2	Cismontane woodland, coastal bluff scrub, valley and foothill grassland. Elevation ranges from 10 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is 4 miles west and is separated by extensive urban development.
coast rockcress *Arabis blepharophylla*	Rank 4.3	Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 10 to 3610 feet (3 to 1100 meters). Blooms Feb-May.	**No Potential.** The project site does not contain suitable habitat for this species.
Franciscan manzanita *Arctostaphylos franciscana*	FE, Rank 1B.1	Coastal scrub. Elevation ranges from 195 to 985 feet (60 to 300 meters). Blooms Feb-Apr.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
Mt. Tamalpais manzanita *Arctostaphylos montana ssp. montana*	Rank 1B.3	Chaparral, valley and foothill grassland. Elevation ranges from 525 to 2495 feet (160 to 760 meters). Blooms Feb-Apr.	**No Potential.** The project site does not contain suitable habitat for this species.
Presidio manzanita *Arctostaphylos montana ssp. ravenii*	FE, SE, Rank 1B.1	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 150 to 705 feet (45 to 215 meters). Blooms Feb-Mar.	**No Potential.** The project site does not contain suitable habitat for this species.
Marin manzanita *Arctostaphylos virgata*	Rank 1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, north coast coniferous forest. Elevation ranges from 195 to 2295 feet (60 to 700 meters). Blooms Jan-Mar.	**No Potential.** The project site does not contain suitable habitat for this species.
marsh sandwort *Arenaria paludicola*	FE, SE, Rank 1B.1	Marshes and swamps. Elevation ranges from 10 to 560 feet (3 to 170 meters). Blooms May-Aug.	**No Potential.** The project site does not contain suitable habitat for this species.
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	Rank 4.2	Chaparral, cismontane woodland. Elevation ranges from 330 to 4595 feet (100 to 1400 meters). Blooms Jan-Dec.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed, in addition to lacking serpentine substrate. The nearest extant Consortium of California Herbaria 2 (CCH2) occurrence is 4 miles southwest and is separated by extensive urban development.
Brewer's milk-vetch *Astragalus breweri*	Rank 4.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 2395 feet (90 to 730 meters). Blooms Apr-Jun.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed, in addition to lacking serpentine substrate. The nearest extant CCH2 occurrence is 4 miles southwest and

Name	Status	Habitat	Occurrence Potential
			is separated by extensive urban development.
ocean bluff milk-vetch *Astragalus nuttallii var. nuttallii*	Rank 4.2	Coastal bluff scrub, coastal dunes. Elevation ranges from 10 to 395 feet (3 to 120 meters). Blooms Jan-Nov.	**No Potential.** The project site does not contain suitable habitat for this species.
coastal marsh milk-vetch *Astragalus pycnostachyus var. pycnostachyus*	Rank 1B.2	Coastal dunes, coastal scrub, marshes and swamps. Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms (Apr)Jun-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
alkali milk-vetch *Astragalus tener var. tener*	Rank 1B.2	Playas, valley and foothill grassland, vernal pools. Elevation ranges from 5 to 195 feet (1 to 60 meters). Blooms Mar-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
Thurber's reed grass *Calamagrostis crassiglumis*	Rank 2B.1	Coastal scrub, marshes and swamps. Elevation ranges from 35 to 195 feet (10 to 60 meters). Blooms May-Aug.	**No Potential.** The project site does not contain suitable habitat for this species.
serpentine reed grass *Calamagrostis ophitidis*	Rank 4.3	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation ranges from 295 to 3495 feet (90 to 1065 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
Brewer's calandrinia *Calandrinia breweri*	Rank 4.2	Chaparral, coastal scrub. Elevation ranges from 35 to 4005 feet (10 to 1220 meters). Blooms (Jan)Mar-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
Tiburon mariposa-lily *Calochortus tiburonensis*	FT, ST, Rank 1B.1	Valley and foothill grassland. Elevation ranges from 165 to 490 feet (50 to 150 meters). Blooms Mar-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
Oakland star-tulip *Calochortus umbellatus*	Rank 4.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 330 to 2295 feet (100 to 700 meters). Blooms Mar-May.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed, in addition to lacking serpentine substrate. The nearest extant CCH2 occurrence is 1.5 miles south and is separated by extensive urban development.
pink star-tulip *Calochortus uniflorus*	Rank 4.2	Coastal prairie, coastal scrub, meadows and seeps, north coast coniferous forest. Elevation ranges from 35 to 3510 feet (10 to 1070 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
Mt. Saint Helena morning-glory *Calystegia collina ssp. oxyphylla*	Rank 4.2	Chaparral, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 915 to 3315 feet (279 to 1010 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
coastal bluff morning-glory *Calystegia purpurata ssp. saxicola*	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, north coast coniferous forest. Elevation ranges from 0 to 345 feet (0 to 105 meters). Blooms (Mar)Apr-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
seaside bittercress *Cardamine angulata*	Rank 2B.2	Lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 50 to 3000 feet (15 to 915 meters). Blooms (Jan)Mar-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
bristly sedge *Carex comosa*	Rank 2B.1	Coastal prairie, marshes and swamps, valley and foothill grassland. Elevation ranges from 0 to 2050 feet (0 to 625 meters). Blooms May-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
Lyngbye's sedge *Carex lyngbyei*	Rank 2B.2	Marshes and swamps. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Aug.	**No Potential.** The project site does not contain suitable habitat for this species.
northern meadow sedge *Carex praticola*	Rank 2B.2	Meadows and seeps. Elevation ranges from 0 to 10500 feet (0 to 3200 meters). Blooms May-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
Tiburon paintbrush *Castilleja affinis var. neglecta*	FE, ST, Rank 1B.2	Valley and foothill grassland. Elevation ranges from 195 to 1310 feet (60 to 400 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
johnny-nip *Castilleja ambigua var. ambigua*	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	**No Potential.** The project site does not contain suitable habitat for this species.
Nicasio ceanothus *Ceanothus decornutus*	Rank 1B.2	Chaparral. Elevation ranges from 770 to 950 feet (235 to 290 meters). Blooms Mar-May.	**No Potential.** The project site does not contain suitable habitat for this species.
glory brush *Ceanothus gloriosus var. exaltatus*	Rank 4.3	Chaparral. Elevation ranges from 100 to 2000 feet (30 to 610 meters). Blooms Mar-Jun (Aug).	**No Potential.** The project site does not contain suitable habitat for this species.
Point Reyes ceanothus *Ceanothus gloriosus var. gloriosus*	Rank 4.3	Closed-cone coniferous forest, coastal bluff scrub, coastal dunes, coastal scrub. Elevation ranges from 15 to 1705 feet (5 to 520 meters). Blooms Mar-May.	**No Potential.** The project site does not contain suitable habitat for this species.
Mason's ceanothus *Ceanothus masonii*	SR, Rank 1B.2	Chaparral. Elevation ranges from 755 to 1640 feet (230 to 500 meters). Blooms Mar-Apr.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
Kern ceanothus *Ceanothus pinetorum*	Rank 4.3	Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest. Elevation ranges from 3410 to 9005 feet (1040 to 2745 meters). Blooms May-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
Point Reyes salty bird's-beak *Chloropyron maritimum ssp. palustre*	Rank 1B.2	Marshes and swamps. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
San Francisco Bay spineflower *Chorizanthe cuspidata var. cuspidata*	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 10 to 705 feet (3 to 215 meters). Blooms Apr-Jul (Aug).	**No Potential.** The project site does not contain suitable habitat for this species.
Franciscan thistle *Cirsium andrewsii*	Rank 1B.2	Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
Mt. Tamalpais thistle *Cirsium hydrophilum var. vaseyi*	Rank 1B.2	Broadleafed upland forest, chaparral, meadows and seeps. Elevation ranges from 785 to 2035 feet (240 to 620 meters). Blooms May-Aug.	**No Potential.** The project site does not contain suitable habitat for this species.
seaside cistanthe *Cistanthe maritima*	Rank 4.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 985 feet (5 to 300 meters). Blooms (Feb)Mar-Jun (Aug).	**No Potential.** The project site does not contain suitable habitat for this species.
Presidio clarkia *Clarkia franciscana*	FE, SE, Rank 1B.1	Coastal scrub, valley and foothill grassland. Elevation ranges from 80 to 1100 feet (25 to 335 meters). Blooms May-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
round-headed Chinese-houses *Collinsia corymbosa*	Rank 1B.2	Coastal dunes. Elevation ranges from 0 to 65 feet (0 to 20 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
San Francisco collinsia *Collinsia multicolor*	Rank 1B.2	Closed-cone coniferous forest, coastal scrub. Elevation ranges from 100 to 900 feet (30 to 275 meters). Blooms (Feb)Mar-May.	**No Potential.** The project site does not contain suitable habitat for this species.
serpentine collomia *Collomia diversifolia*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 1970 feet (200 to 600 meters). Blooms May-Jun.	**Unlikely**. Although the project site has cismontane woodland habitat, the habitat is heavily disturbed, in addition to lacking serpentine substrate. The nearest extant CCH2 occurrence is 4.8 miles southwest and is separated by extensive urban development.
California lady's-slipper *Cypripedium californicum*	Rank 4.2	Bogs and fens, lower montane coniferous forest. Elevation ranges from 100 to 9025 feet (30 to 2750 meters). Blooms Apr-Aug (Sep).	**No Potential.** The project site does not contain suitable habitat for this species.
western dichondra *Dichondra occidentalis*	Rank 4.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 165 to 1640 feet (50 to 500 meters). Blooms (Jan)Mar-Jul.	**No Potential.** There are no documented occurrences within 10 miles of the project site.
western leatherwood *Dirca occidentalis*	Rank 1B.2	Broadleafed upland forest, chaparral, cismontane woodland, closed-cone coniferous forest, north coast coniferous forest, riparian forest, riparian woodland. Elevation ranges from 80 to 1395 feet (25 to 425 meters). Blooms Jan-Mar (Apr).	**Unlikely**. Although the project site has cismontane woodland and riparian woodland habitats, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is 5.9 miles southwest and is

Name	Status	Habitat	Occurrence Potential
			separated by extensive urban development.
small spikerush *Eleocharis parvula*	Rank 4.3	Marshes and swamps. Elevation ranges from 5 to 9910 feet (1 to 3020 meters). Blooms (Apr)Jun-Aug (Sep).	**No Potential.** The project site does not contain suitable habitat for this species.
California bottle-brush grass *Elymus californicus*	Rank 4.3	Broadleafed upland forest, cismontane woodland, north coast coniferous forest, riparian woodland. Elevation ranges from 50 to 1540 feet (15 to 470 meters). Blooms May-Aug (Nov).	**Unlikely.** Although the project site has cismontane woodland and riparian woodland habitats, the habitats are heavily disturbed due to surrounding development. The nearest extant CCH2 occurrence is 2 miles southwest and is separated by extensive urban development.
Koch's cord moss *Entosthodon kochii*	Rank 1B.3	Cismontane woodland. Elevation ranges from 590 to 3280 feet (180 to 1000 meters).	**Unlikely**. Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is 8.6 miles northwest and is separated by extensive urban development.
marsh horsetail *Equisetum palustre*	Rank 3	Marshes and swamps. Elevation ranges from 150 to 3280 feet (45 to 1000 meters). Blooms Unk.	**No Potential.** The project site does not contain suitable habitat for this species.
Tiburon buckwheat *Eriogonum luteolum var. caninum*	Rank 1B.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms May-Sep.	**Unlikely**. Although the project site has cismontane woodland habitat, the habitat is heavily disturbed and lacks serpentine substrate. The nearest extant CNDDB occurrence is 1.5 miles northeast and is

Name	Status	Habitat	Occurrence Potential
			separated by extensive urban development.
San Francisco wallflower *Erysimum franciscanum*	Rank 4.2	Chaparral, coastal dunes, coastal scrub, valley and foothill grassland. Elevation ranges from 0 to 1805 feet (0 to 550 meters). Blooms Mar-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
bare monkeyflower *Erythranthe nudata*	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 655 to 2295 feet (200 to 700 meters). Blooms May-Jun.	**Unlikely**. Although the project site has cismontane woodland habitat, the habitat is heavily disturbed and lacks serpentine substrate. The nearest extant CCH2 occurrence over 40 miles northeast and is separated by extensive urban development.
minute pocket moss *Fissidens pauperculus*	Rank 1B.2	North coast coniferous forest. Elevation ranges from 35 to 3360 feet (10 to 1024 meters).	**No Potential.** The project site does not contain suitable habitat for this species.
Marin checker lily *Fritillaria lanceolata var. tristulis*	Rank 1B.1	Coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 50 to 490 feet (15 to 150 meters). Blooms Feb-May.	**No Potential.** The project site does not contain suitable habitat for this species.
fragrant fritillary *Fritillaria liliacea*	Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 10 to 1345 feet (3 to 410 meters). Blooms Feb-Apr.	**Unlikely**. Although the project site has cismontane woodland habitat, the habitat is heavily disturbed and lacks serpentine substrate. The nearest extant CNDDB occurrence is 10.5 miles northeast and is separated by extensive urban development.

Name	Status	Habitat	Occurrence Potential
blue coast gilia *Gilia capitata ssp. chamissonis*	Rank 1B.1	Coastal dunes, coastal scrub. Elevation ranges from 5 to 655 feet (2 to 200 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
woolly-headed gilia *Gilia capitata ssp. tomentosa*	Rank 1B.1	Coastal bluff scrub, valley and foothill grassland. Elevation ranges from 35 to 720 feet (10 to 220 meters). Blooms May-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
dark-eyed gilia *Gilia millefoliata*	Rank 1B.2	Coastal dunes. Elevation ranges from 5 to 100 feet (2 to 30 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
San Francisco gumplant *Grindelia hirsutula var. maritima*	Rank 3.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland. Elevation ranges from 50 to 1310 feet (15 to 400 meters). Blooms Jun-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
Diablo helianthella *Helianthella castanea*	Rank 1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Elevation ranges from 195 to 4265 feet (60 to 1300 meters). Blooms Mar-Jun.	**Unlikely**. Although the project site has cismontane woodland and riparian woodland habitats, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is 4.6 miles south and is separated by extensive urban development.
congested-headed hayfield tarplant *Hemizonia congesta ssp. congesta*	Rank 1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1835 feet (20 to 560 meters). Blooms Apr-Nov.	**No Potential.** The project site does not contain suitable habitat for this species.
Marin western flax *Hesperolinon congestum*	FT, ST, Rank 1B.1	Chaparral, valley and foothill grassland. Elevation ranges from 15 to 1215 feet (5 to 370 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
water star-grass *Heteranthera dubia*	Rank 2B.2	Marshes and swamps. Elevation ranges from 100 to 4905 feet (30 to 1495 meters). Blooms Jul-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
Santa Cruz tarplant *Holocarpha macradenia*	FT, SE, Rank 1B.1	Coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 35 to 720 feet (10 to 220 meters). Blooms Jun-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
Kellogg's horkelia *Horkelia cuneata var. sericea*	Rank 1B.1	Chaparral, closed-cone coniferous forest, coastal dunes, coastal scrub. Elevation ranges from 35 to 655 feet (10 to 200 meters). Blooms Apr-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
Point Reyes horkelia *Horkelia marinensis*	Rank 1B.2	Coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 15 to 2475 feet (5 to 755 meters). Blooms May-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
thin-lobed horkelia *Horkelia tenuiloba*	Rank 1B.2	Broadleafed upland forest, chaparral, valley and foothill grassland. Elevation ranges from 165 to 1640 feet (50 to 500 meters). Blooms May-Jul (Aug).	**No Potential.** The project site does not contain suitable habitat for this species.
harlequin lotus *Hosackia gracilis*	Rank 4.2	Broadleafed upland forest, cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, meadows and seeps, north coast coniferous forest, valley and foothill grassland. Elevation ranges from 0 to 2295 feet (0 to 700 meters). Blooms Mar-Jul.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is 3.5 miles southwest and is separated by extensive urban development.
island tube lichen *Hypogymnia schizidiata*	Rank 1B.3	Chaparral, closed-cone coniferous forest. Elevation ranges from 1180 to 1330 feet (360 to 405 meters).	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
coast iris *Iris longipetala*	Rank 4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms Mar-May (Jun).	**No Potential.** The project site does not contain suitable habitat for this species.
southwestern spiny rush *Juncus acutus ssp. leopoldii*	Rank 4.2	Coastal dunes, marshes and swamps, meadows and seeps. Elevation ranges from 10 to 2955 feet (3 to 900 meters). Blooms (Mar)May-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
small groundcone *Kopsiopsis hookeri*	Rank 2B.3	North coast coniferous forest. Elevation ranges from 295 to 2905 feet (90 to 885 meters). Blooms Apr-Aug.	**No Potential.** The project site does not contain suitable habitat for this species.
beach layia *Layia carnosa*	FT, SE, Rank 1B.1	Coastal dunes, coastal scrub. Elevation ranges from 0 to 195 feet (0 to 60 meters). Blooms Mar-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
bristly leptosiphon *Leptosiphon acicularis*	Rank 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Elevation ranges from 180 to 4920 feet (55 to 1500 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
large-flowered leptosiphon *Leptosiphon grandiflorus*	Rank 4.2	Cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 4005 feet (5 to 1220 meters). Blooms Apr-Aug.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is more than 20 miles northwest and is separated by extensive urban development.
broad-lobed leptosiphon *Leptosiphon latisectus*	Rank 4.3	Broadleafed upland forest, cismontane woodland. Elevation ranges from 560 to 4920 feet (170 to 1500 meters). Blooms Apr-Jun.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is more than 20 miles northwest and is separated by extensive urban development.

Name	Status	Habitat	Occurrence Potential
rose leptosiphon *Leptosiphon rosaceus*	Rank 1B.1	Coastal bluff scrub. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
San Francisco lessingia *Lessingia germanorum*	FE, SE, Rank 1B.1	Coastal scrub. Elevation ranges from 80 to 360 feet (25 to 110 meters). Blooms (Jun)Jul-Nov.	**No Potential.** The project site does not contain suitable habitat for this species.
woolly-headed lessingia *Lessingia hololeuca*	Rank 3	Broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
Tamalpais lessingia *Lessingia micradenia var. micradenia*	Rank 1B.2	Chaparral, valley and foothill grassland. Elevation ranges from 330 to 1640 feet (100 to 500 meters). Blooms (Jun)Jul-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
Mt. Diablo cottonweed *Micropus amphibolus*	Rank 3.2	Broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland. Elevation ranges from 150 to 2705 feet (45 to 825 meters). Blooms Mar-May.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is 2 miles northeast.
marsh microseris *Microseris paludosa*	Rank 1B.2	Cismontane woodland, closed-cone coniferous forest, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun (Jul).	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is 3.5 miles southeast and is separated by extensive urban development.
elongate copper moss *Mielichhoferia elongata*	Rank 4.3	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, subalpine coniferous	**No Potential.** There are no documented occurrences within 10 miles of the project site.

Name	Status	Habitat	Occurrence Potential
		forest. Elevation ranges from 0 to 6430 feet (0 to 1960 meters).	
Marin County navarretia *Navarretia rosulata*	Rank 1B.2	Chaparral, closed-cone coniferous forest. Elevation ranges from 655 to 2085 feet (200 to 635 meters). Blooms May-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
white-rayed pentachaeta *Pentachaeta bellidiflora*	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland. Elevation ranges from 115 to 2035 feet (35 to 620 meters). Blooms Mar-May.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CNDDB occurrence is over 100 years old, is located 1.8 miles southwest and is separated by extensive urban development.
Gairdner's yampah *Perideridia gairdneri ssp. gairdneri*	Rank 4.2	Broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 2000 feet (0 to 610 meters). Blooms Jun-Oct.	**No Potential.** The project site does not contain suitable habitat for this species.
Michael's rein orchid *Piperia michaelii*	Rank 4.2	Chaparral, cismontane woodland, closed-cone coniferous forest, coastal bluff scrub, coastal scrub, lower montane coniferous forest. Elevation ranges from 10 to 3000 feet (3 to 915 meters). Blooms Apr-Aug.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is 6 miles to the east, on the other side of the San Francisco Bay.
Choris' popcornflower *Plagiobothrys chorisianus var. chorisianus*	Rank 1B.2	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 10 to 525 feet (3 to 160 meters). Blooms Mar-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
San Francisco popcornflower *Plagiobothrys diffusus*	SE, Rank 1B.1	Coastal prairie, valley and foothill grassland. Elevation ranges from 195 to 1180 feet (60 to 360 meters). Blooms Mar-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
hairless popcornflower *Plagiobothrys glaber*	Rank 1A	Marshes and swamps, meadows and seeps. Elevation ranges from 50 to 590 feet (15 to 180 meters). Blooms Mar-May.	**No Potential.** The project site does not contain suitable habitat for this species.
North Coast semaphore grass *Pleuropogon hooverianus*	ST, Rank 1B.1	Broadleafed upland forest, meadows and seeps, north coast coniferous forest. Elevation ranges from 35 to 2200 feet (10 to 671 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
nodding semaphore grass *Pleuropogon refractus*	Rank 4.2	Lower montane coniferous forest, meadows and seeps, north coast coniferous forest, riparian forest. Elevation ranges from 0 to 5250 feet (0 to 1600 meters). Blooms (Mar)Apr-Aug.	**Unlikely.** Although the project site has cismontane woodland and riparian habitats and steady bank microhabitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is 3 miles to the southwest, separated by extensive urban development.
Oregon polemonium *Polemonium carneum*	Rank 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation ranges from 0 to 6005 feet (0 to 1830 meters). Blooms Apr-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
Marin knotweed *Polygonum marinense*	Rank 3.1	Marshes and swamps. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms (Apr)May-Aug (Oct).	**No Potential.** The project site does not contain suitable habitat for this species.
Tamalpais oak *Quercus parvula var. tamalpaisensis*	Rank 1B.3	Lower montane coniferous forest. Elevation ranges from 330 to 2460 feet (100 to 750 meters). Blooms Mar-Apr.	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
Lobb's aquatic buttercup *Ranunculus lobbii*	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 50 to 1540 feet (15 to 470 meters). Blooms Feb-May.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is 6 miles to the north, separated by extensive urban development.
adobe sanicle *Sanicula maritima*	SR, Rank 1B.1	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland. Elevation ranges from 100 to 785 feet (30 to 240 meters). Blooms Feb-May.	**No Potential.** The project site does not contain suitable habitat for this species.
Point Reyes checkerbloom *Sidalcea calycosa ssp. rhizomata*	Rank 1B.2	Marshes and swamps. Elevation ranges from 10 to 245 feet (3 to 75 meters). Blooms Apr-Sep.	**No Potential.** The project site does not contain suitable habitat for this species.
Marin checkerbloom *Sidalcea hickmanii ssp. viridis*	Rank 1B.1	Chaparral. Elevation ranges from 165 to 1410 feet (50 to 430 meters). Blooms May-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
Scouler's catchfly *Silene scouleri ssp. scouleri*	Rank 2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms (Mar-May) Jun-Aug (Sep).	**No Potential.** The project site does not contain suitable habitat for this species.
San Francisco campion *Silene verecunda ssp. verecunda*	Rank 1B.2	Chaparral, coastal bluff scrub, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 100 to 2115 feet (30 to 645 meters). Blooms (Feb)Mar-Jul (Aug).	**No Potential.** The project site does not contain suitable habitat for this species.

Name	Status	Habitat	Occurrence Potential
long-styled sand-spurrey *Spergularia macrotheca var. longistyla*	Rank 1B.2	Marshes and swamps, meadows and seeps. Elevation ranges from 0 to 835 feet (0 to 255 meters). Blooms Feb-May.	**No Potential.** The project site does not contain suitable habitat for this species.
Santa Cruz microseris *Stebbinsoseris decipiens*	Rank 1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 35 to 1640 feet (10 to 500 meters). Blooms Apr-May.	**No Potential.** The project site does not contain suitable habitat for this species.
Tamalpais jewelflower *Streptanthus batrachopus*	Rank 1B.3	Chaparral, closed-cone coniferous forest. Elevation ranges from 1000 to 2135 feet (305 to 650 meters). Blooms Apr-Jul.	**No Potential.** The project site does not contain suitable habitat for this species.
Tiburon jewelflower *Streptanthus glandulosus ssp. niger*	FE, SE, Rank 1B.1	Valley and foothill grassland. Elevation ranges from 100 to 490 feet (30 to 150 meters). Blooms May-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
Mt. Tamalpais bristly jewelflower *Streptanthus glandulosus ssp. pulchellus*	Rank 1B.2	Chaparral, valley and foothill grassland. Elevation ranges from 490 to 2625 feet (150 to 800 meters). Blooms May-Jul (Aug).	**No Potential.** The project site does not contain suitable habitat for this species.
Suisun Marsh aster *Symphyotrichum lentum*	Rank 1B.2	Marshes and swamps. Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms (Apr)May-Nov.	**No Potential.** The project site does not contain suitable habitat for this species.
marsh zigadenus *Toxicoscordion fontanum*	Rank 4.2	Chaparral, cismontane woodland, lower montane coniferous forest, marshes and swamps, meadows and seeps. Elevation ranges from 50 to 3280 feet (15 to 1000 meters). Blooms Apr-Jul.	**Unlikely.** Although the project site has cismontane woodland habitat, the habitat is heavily disturbed. The nearest extant CCH2 occurrence is 3.5 miles to the

Name	Status	Habitat	Occurrence Potential
			southwest, separated by extensive urban development.
two-fork clover *Trifolium amoenum*	FE, Rank 1B.1	Coastal bluff scrub, valley and foothill grassland. Elevation ranges from 15 to 1360 feet (5 to 415 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland, vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
San Francisco owl's-clover *Triphysaria floribunda*	Rank 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 35 to 525 feet (10 to 160 meters). Blooms Apr-Jun.	**No Potential.** The project site does not contain suitable habitat for this species.
coastal triquetrella Triquetrella californica	Rank 1B.2	Coastal bluff scrub, coastal scrub. Elevation ranges from 35 to 330 feet (10 to 100 meters).	**No Potential.** The project site does not contain suitable habitat for this species.
Mammals			
Pallid bat *Antrozous pallidus*	CDFW Species of Special Concern Western Bat working Group (WBWG) High Priority	Found in a variety of habitats ranging from grasslands to mixed forests, favoring open and dry, rocky areas. Roost sites include crevices in rock outcrops and cliffs, caves, mines, hollow trees, and various manmade structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**No Potential**. No potential roosting sites are present within the project site. No hollow trees, crevices, snags, or suitable manmade structures were observed. The project site is adjacent to development and is subject to an anthropogenic disturbance.

Name	Status	Habitat	Occurrence Potential
Townsend's big-eared bat *Corynorhinus townsendii*	CDFW Species of Special Concern WBWG High Priority	Associated with a wide variety of habitats from deserts to higher elevation mixed and coniferous forests. Females form maternity colonies in buildings, caves and mines, and males roost singly or in small groups. Foraging typically occurs at edge habitats near wooded areas, e.g., along streams.	**No Potential**. No potential roosting sites were observed within the project site. The project site does not contain suitable building features, caves, or mines.
Western red bat *Lasiurus blossevillii*	CDFW Species of Special Concern WBWG High Priority	Highly migratory and typically solitary, roosting primarily in the foliage of trees or shrubs. Roosts are usually in broad-leaved trees including cottonwoods, sycamores, alders, and maples. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas.	**No Potential**. No suitable roosting trees were observed within the project site.
Hoary bat *Lasiurus cinereus*	WBWG Medium Priority	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths.	**No Potential**. No suitable roosting trees were observed within the project site.
San Pablo vole *Microtus californicus sanpabloensis*	CDFW Species of Special Concern	Salt marshes of San Pablo Creek, on the south shore of San Pablo Bay. Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow.	**No Potential.** The project site does not contain salt marsh habitat.
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE SE	Endemic to emergent salt and brackish wetlands of the San Francisco Bay Estuary. Pickleweed marshes are primary habitat; also occurs in various other wetland communities with dense vegetation. Does	**No Potential.** The project site does not contain pickleweed marshes or wetland communities with dense vegetation.

Name	Status	Habitat	Occurrence Potential
	CDFW Fully Protected	not burrow, builds loosely organized nests. Requires high flood areas for flood escape.	
Point Reyes jumping mouse *Zapus trinotatus orarius*	CDFW Species of Special Concern	Restricted to Point Reyes Peninsula in western Marin County. Occurs in wet, marshy coastal meadows and humus-filled dark soils of coast redwood forests, also thickets of woody vegetation along streams and seeps. Eats mainly grass seeds with some insects and fruit taken. Builds grassy nests on ground under vegetation, burrows in winter.	**No Potential.** The project site occurs outside of the current known range for this species.
Suisun shrew *Sorex ornatus sinuosus*	CDFW Species of Special Concern	Tidal marshes of the northern shores of San Pablo and Suisun Bays. Require dense low-lying cover and driftwood and other litter above the mean hightide line for nesting and foraging.	**No Potential.** The project site does not contain tidal marsh habitat.
Salt-marsh wandering shrew *Sorex vagrans halicoetes*	CDFW Species of Special Concern	Salt marshes of the south arm of San Francisco Bay. Medium high marsh 6 to 8 feet above sea level where abundant driftwood is scattered among Salicornia.	**No Potential.** The project site does not contain salt marsh habitat.
American badger *Taxidea taxus*	CDFW Species of Special Concern	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**No Potential.** No suitably sized mammal burrows were observed within the project site. The project site is bordered by development on all sides and does not convey connectivity to large areas of open space.

Name	Status	Habitat	Occurrence Potential
Point Reyes mountain beaver *Aplodontia rufa phaea*	CDFW Species of Special Concern	Occurs only in western Marin County, almost entirely within Point Reyes National Seashore. Found on moist slopes within areas of coastal scrub and other habitats with herbaceous vegetation. Lives in extensive burrow systems and forages on a variety of herbaceous plants.	**No Potential.** The project site occurs outside of the current known range for this species.
Southern sea otter *Enhydra lutris nereis*	FT CDFW Fully Protected	Nearshore marine environments from about Año Nuevo, San Mateo County. To Point Sal, Santa Barbara County. Needs canopies of giant kelp and bull kelp for rafting and feeding. Prefers rocky substrates with abundant invertebrates.	**No Potential.** The project site does not contain any suitable marine habitat.
Birds			
Short-eared owl *Asio flammeus*	CDFW Species of Special Concern	Occurs year-round, but primarily as a winter visitor, breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	**No Potential.** The project site is not within the breeding range of this species.
Burrowing owl *Athene cunicularia*	CDFW Species of Special Concern	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.	**No Potential.** Suitable habitat does not occur within the project site. No mammal burrows or suitable burrow surrogates were observed.

Name	Status	Habitat	Occurrence Potential
Western snowy plover *Charadrius nivosus nivosus*	FT CDFW Species of Special Concern	Federal listing applies only to the Pacific coastal population. Year-round resident and winter visitor. Occurs on sandy beaches, salt pond levees, and the shores of large alkali lakes. Nests on the ground, requiring sandy, gravelly or friable soils.	**No Potential.** The project site does not contain sandy beaches, salt pond levees, or alkali flat shoreline.
Northern harrier *Circus hudsonius*	CDFW Species of Special Concern	Year-round resident and winter visitor. Found in open habitats including grasslands, prairies, marshes and agricultural areas. Nests on the ground in dense vegetation, typically near water or otherwise moist areas. Preys on small vertebrates.	**No Potential.** Suitable nesting habitat does not occur within the project site.
Black swift *Cypseloides niger*	CDFW Species of Special Concern	Summer resident with a fragmented breeding distribution; most occupied areas in California either montane or coastal. Breeds in small colonies on cliffs behind or adjacent to waterfalls, in deep canyons, and sea-bluffs above surf. Forages aerially over wide areas.	**No Potential.** The project site does not contain cliffs, canyons, or sea bluffs to support nesting colonies.
White-tailed kite *Elanus leucurus*	CDFW Fully Protected	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	**Moderate Potential.** Trees within the project site and immediate vicinity may provide potential nesting habitat; however, the proximity of the project site to residential development and anthropogenic disturbance reduces suitability for nesting.

Name	Status	Habitat	Occurrence Potential
American peregrine falcon *Falco peregrinus anatum*	Federal Delisted California Delisted CDFW Fully Protected	Year-round resident and winter visitor. Occurs in a wide variety of habitats, though often associated with coasts, bays, marshes and other bodies of water. Nests on protected cliffs and also on man-made structures including buildings and bridges. Preys on birds, especially water birds. Forages widely.	**No Potential.** The project site does not provide protected cliffs or suitable manmade structures for nesting.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CDFW Species of Special Concern	Resident of the San Francisco Bay region, in fresh and saltwater marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**No Potential.** No marsh habitat is present within the project site.
California black rail *Laterallus jamaicensis coturniculus*	ST CDFW Fully Protected	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	**No Potential.** No marsh habitat is present within the project site.
Alameda song sparrow *Melospiza melodia pusillula*	CDFW Species of Special Concern	Year-round resident of salt marshes bordering the south arm of San Francisco Bay. Inhabits primarily pickleweed marshes; nests placed in marsh vegetation, typically shrubs such as gum plant.	**No Potential.** No marsh habitat is present within the project site.
San Pablo song sparrow *Melospiza melodia samuelis*	CDFW Species of Special Concern	Year-round resident of tidal marshes along the north side of San Francisco and San Pablo Bays. Typical habitat is dominated by pickleweed, with gum plant and other shrubs present in the upper zone for nesting. May forage in areas adjacent to marshes.	**No Potential.** No marsh habitat is present within the project site.

Name	Status	Habitat	Occurrence Potential
California Ridgway's rail *Rallus obsoletus obsoletus*	FE SE CDFW Fully Protected	Year-round resident in tidal marshes of the San Francisco Bay estuary. Requires tidal sloughs and intertidal mud flats for foraging, and dense marsh vegetation for nesting and cover. Typical habitat features abundant growth of cordgrass and pickleweed. Feeds primarily on mollusks and crustaceans.	**No Potential.** No marsh habitat is present within the project site.
Bank swallow *Riparia riparia*	ST	Summer resident in riparian and other lowland habitats near rivers, lakes and the ocean in northern California. Nests colonially in excavated burrows on vertical cliffs and bank cuts (natural and manmade) with fine-textured soils. Historical nesting range in southern and central areas of California has been eliminated by habitat loss. Currently known to breed in Siskiyou, Shasta, and Lassen Cos., portions of the north coast, and along Sacramento River from Shasta Co. south to Yolo Co.	**No Potential.** The project site occurs outside of the current known breeding range for this species.
Reptiles and Amphibians			
Western pond turtle *Emys marmorata*	CDFW Species of Special Concern	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	**Moderate Potential.** This species has not been documented in the project site or immediate vicinity. However, San Rafael Creek may provide suitable aquatic habitat. This species is unlikely to nest in adjacent uplands due to do bank steepness but could disperse through aquatic habitat within the project site during periods of deep flows.

Name	Status	Habitat	Occurrence Potential
California giant salamander *Dicamptodon ensatus*	CDFW Species of Special Concern	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent or semi-permanent streams. Larvae usually remain aquatic for over a year.	**No Potential.** The nearest documented occurrence is approximately 4 miles south and is from 1964. The project site does not provide suitable aquatic breeding habitat and is surrounded by heavy residential development. Due to lack of breeding habitat, distance from source populations, and barriers to dispersal, it is unlikely that this species would occupy the project site.
Foothill yellow-legged frog *Rana boylii*	SE CDFW Species of Special Concern	Found in or adjacent to rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	**Unlikely.** This species was documented 1.3 miles southwest in association with Anselmo Creek in 1931. However, the observation was not verified, and this species is currently presumed to be extirpated from the area. The nearest recent occurrence is over 4 miles from the project site. Given the distance from source populations, surrounding development, and the urbanized nature of the drainage, it is unlikely that this species would occupy the project site.
California red-legged frog *Rana draytonii*	FT CDFW Species of Special Concern	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with	**Unlikely.** The project site does not provide suitable aquatic breeding habitat for this species. The nearest documented occurrence is approximately 4.3 miles northeast. The project site is surrounded by dense development on all sides, so dispersal through adjacent uplands is

Name	Status	Habitat	Occurrence Potential
		extensive vegetation. Disperses through upland habitats after rains.	unlikely. Due to the lack of suitable habitat, dispersal barriers, and absence of local source populations, this species is unlikely to occupy the project site.
Fish and Invertebrates			
Tidewater goby *Eucyclogobius newberryi*	FE	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches; requires fairly still but not stagnant water and high oxygen levels.	**No Potential.** No suitable aquatic habitat is present within the project site.
Coho salmon - central California coast ESU *Oncorhynchus kisutch pop. 4*	FE SE	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	**No Potential.** No suitable aquatic habitat is present within the project site.
Steelhead - central California coast DPS *Oncorhynchus mykiss irideus pop. 8*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also, in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles	**No Potential.** This species is not known to occur in Redwood Creek.[17] Several long-culverted sections of creek downstream from the Project site present barriers to fish passage and likely preclude this

[17] *Leidy, R.A., G.S. Becker, B.N. Harvey. 2005. Historical distribution and current status of steelhead/rainbow trout (Oncorhynchus mykiss) in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, Oakland, CA.*

Name	Status	Habitat	Occurrence Potential
		remain in fresh water for 1 or more years before migrating downstream to the ocean.	species from travelling upstream into aquatic habitat within the Project Site.
Sacramento splittail *Pogonichthys macrolepidotus*	CDFW Species of Special Concern	Formerly endemic to the lakes and rivers of the Central Valley, but now confined to the Sacramento Delta, Suisun Bay and associated marshes. Occurs in slow-moving river sections and dead-end sloughs. Requires flooded vegetation for spawning and foraging for young. A freshwater species, but tolerant of moderate salinity (10-18 parts per thousand).	**No Potential.** No suitable aquatic habitat is present within the project site.
Longfin smelt *Spirinchus thaleichthys*	FC ST	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt but can be found in completely freshwater to almost pure seawater.	**No Potential.** No suitable aquatic habitat is present within the project site.
Eulachon *Thaleichthys pacificus*	FT	Found in Klamath River, Mad River, Redwood Creek and in small numbers in Smith River and Humboldt Bay tributaries. Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand and woody debris.	**No Potential.** No suitable aquatic habitat is present within the project site.
Western bumble bee *Bombus occidentalis*	SCT	Formerly common throughout much of western North America; populations from southern British Columbia to central California have nearly disappeared. Occurs in a wide variety of habitat types. Nests are constructed annually in pre-existing cavities, usually on the ground (e.g., mammal burrows). Many plant species are visited and pollinated.	**No Potential.** The project site is outside of this species known current distribution. There are no recent documented occurrences of this species in the project site.

Name	Status	Habitat	Occurrence Potential
Monarch - California overwintering population *Danaus plexippus pop. 1*	FC	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress), with nectar and water sources nearby.	**No Potential.** Suitable winter roost habitat does not occur within the project site.
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. Plantago erecta is the primary host plant; Orthocarpus densiflorus and O. purpurascens are the secondary host plants.	**No Potential.** The project site does not contain serpentine soil, nor the appropriate host plants for this species.
Callippe silverspot butterfly *Speyeria callippe callippe*	FE	Two populations in San Bruno Mountain and the Cordelia Hills are recognized. Hostplant is Viola pedunculata, which is found on serpentine soils. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	**No Potential.** The project site is not within the current known range for this species. No host plants or serpentine soils were observed.
California freshwater shrimp *Syncaris pacifica*	FE SE	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from mainstream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**Unlikely.** Aquatic habitat within the project site provides poor habitat for this species. Riparian cover is moderate downstream, but banks on both sides are covered in erosion control materials and exposed root systems are not present. The nearest documented occurrence is approximately 12 miles west of the project site. Given the quality of habitat and distance from potential source populations, this species is unlikely to occur within the project site.

Name	Status	Habitat	Occurrence Potential
Status Key: California Rare Plant Rank: 1A – Presumed extirpated or extinct because they have not been seen or collected in the wild in California for many year 1B – Rare, threatened, or endangered in California and elsewhere 2B – Rare, threatened, or endangered in California but common elsewhere 3 – Review list, more information is needed 4 – Watch list species of limited distribution in California **Threat Categories:** .1 – Seriously endangered in California .2 – Fairly endangered in California .3 – Not very endangered in California FC - Federal Candidate FE – Federal Endangered FT – Federal Threatened SCT – State Candidate Threatened SE – State Endangered ST – State Threatened SR – State Rare			

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporated.***

Special-Status Plants

The project site does not provide potential suitable habitat for special-status plant species as discussed in Environmental Setting section and shown in Table 1. No impact would occur.

Birds

Special Status and Non-Special-Status Nesting Birds

Trees in the vicinity of the project site may provide potential nesting habitat for white-tailed kite, a CDFW fully protected species. Non-special-status native birds (e.g., passerines, raptors) may also nest on the ground, in trees, and in vegetation within the project site and surrounding area. The active nests of such birds are protected under the federal Migratory Bird Treaty Act (MBTA) as well as by California Fish and Game Codes (CFGC). If construction occurs during the avian nesting season, generally defined as February 1 to August 31, nesting birds may be impacted through the removal of nest structures or through localized disturbance sufficient to cause nest abandonment. The project impacts on white-tailed kite and other native nesting birds are potentially significant. Mitigation Measure BIO-1 requires worker training to aid construction workers in identification and avoidance of white-tailed kite. Mitigation Measure BIO-2 requires a pre-construction survey for white-tailed kite and other nesting birds be conducted prior to the start of construction, if work is scheduled to occur during the nesting bird season. Impacts to white-tailed kite would be less than significant with mitigation incorporated.

Reptiles and Amphibians

Western Pond Turtle

Western pond turtle (WPT) may occur in San Rafael Creek which traverses the project site. This species has not been documented within the project site or surrounding area, but San Rafael Creek may provide suitable aquatic habitat. Due to the steepness of creek banks and other physical exclusion barriers (e.g., chain link fencing), WPT is unlikely to nest within adjacent upland areas. However, this species may disperse through or bask in aquatic habitat during periods of deep flows. Construction activities have the potential to impact individuals if one were to enter the active construction area. Impacts on WPT are potentially significant. Mitigation Measure BIO-1 requires worker training to aid construction workers in identification and avoidance of WPT. Mitigation Measure BIO-3 requires a pre-construction survey for special-status species and grants stop work authority if western pond turtles are encountered within the project site during construction. Impacts to western pond turtle would be less than significant with mitigation incorporated.

Mitigation Measure BIO-1: A qualified biologist shall conduct worker environmental

awareness training for personnel working on earthmoving and/or construction activities. Personnel shall be required to attend the training, which shall describe the Federal and State statues protecting threatened, endangered, and special-status species that may be encountered on-site; minimization and conservation measures; legal protection of species; and other related issues.

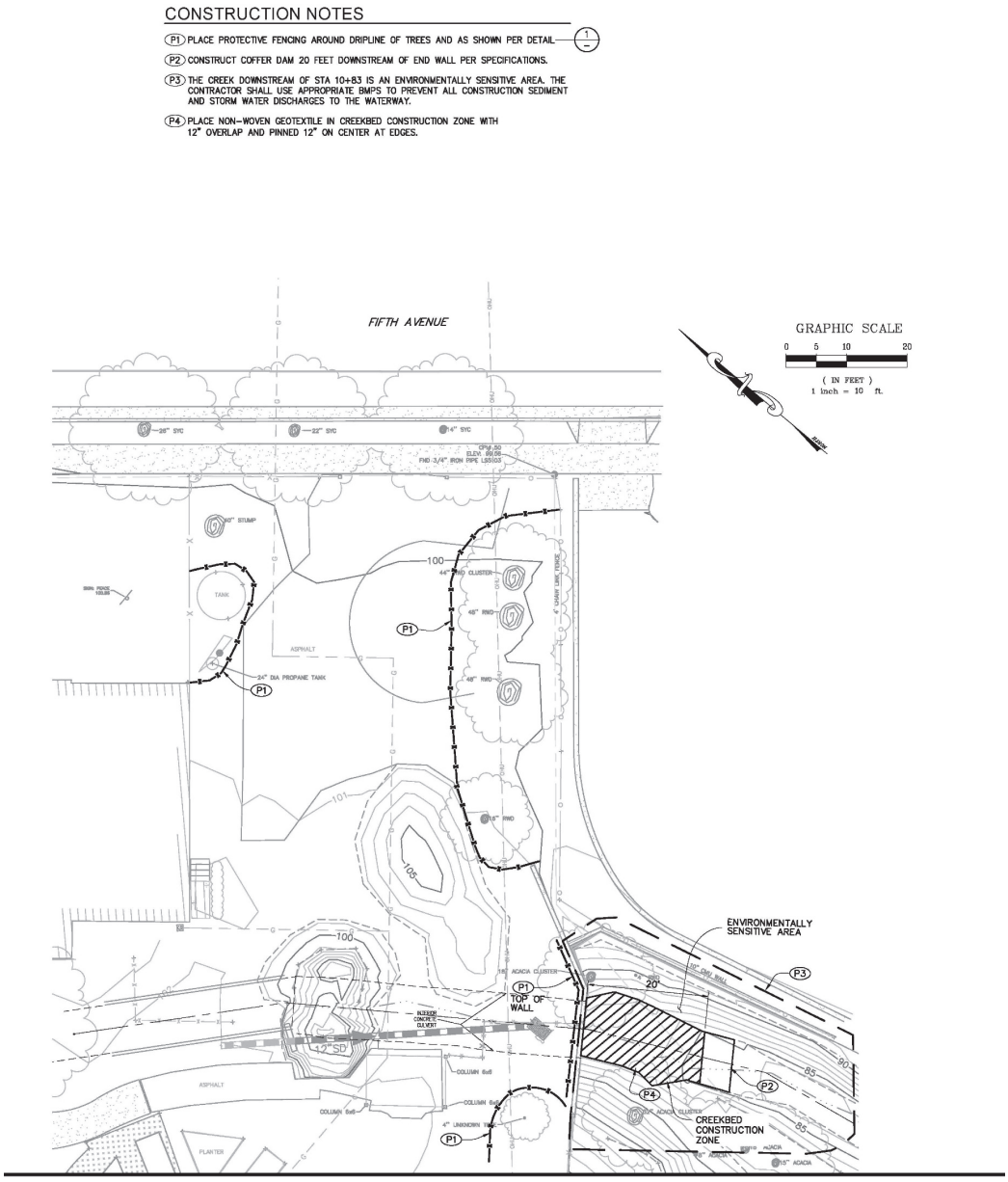
Mitigation Measure BIO-2: If construction activities are initiated during the nesting season (February 1 – August 31), a nesting bird survey shall be conducted by a qualified biologist within 7 days prior to the start of construction within the project site and the immediately surrounding area. If active nests are present, exclusion buffers appropriate to the species shall be established by the qualified biologist to prevent impacts to nesting birds. Buffers shall be maintained until the biologist determines that young have fledged, or the nest becomes inactive.

Mitigation Measure BIO-3: The City and their contractor shall implement the following measures to reduce or avoid impacts to western pond turtle:

- A pre-construction survey for western pond turtle shall occur within 48 hours prior the start of construction activities within the aquatic habitat in the vicinity of the project site.
- If a western pond turtle is observed in areas of active construction, construction shall cease, and a qualified biologist will be notified. Construction may resume when the biologist has inspected and determined that the western pond turtle has moved away from the area of active construction.

b) ***Less than Significant Impact.*** There is mixed riparian woodland and intermittent stream habitat located downstream of the culvert end wall as shown on Figure 5. Temporary construction activities would occur within these habitats, identified as the "Creek Bed Construction Zone"; this is the creek bed approximately within 20 feet downstream of the culvert end wall, and approximately 10 feet wide (Figure 6). Geotextile fabric would be installed within the Creek Bed Construction Zone. A temporary cofferdam would be installed immediately downstream of the Creek Bed Construction Zone. These temporary measures are implemented as construction BMPs to reduce downstream impacts like sedimentation during construction. Upon completion, all construction materials (including geotextile fabric, cofferdam, and tools) would be removed from the mixed riparian woodland and intermittent stream habitats. In addition, permits from all applicable agencies to conduct temporary work in the riparian/intermittent stream habitat area would be obtained – this is discussed further in section (c) below. Implementation of construction BMPs would ensure that impacts to mixed riparian woodland and intermittent stream habitat would be less than significant.

Figure 6 Protective Fencing and Erosion Control Plan



Source: Coastland DCCM. July 2022. Project Plans for Rotary Manor Culvert Replacement Project,

c) ***Less than Significant Impact.*** San Rafael Creek flows into the existing culvert in the project area. San Rafael Creek is potentially subject to jurisdiction of U.S. Army Corps of Engineers (Corps, waters of U.S.), Regional Water Quality Control Board (RWQCB), and CDFW (waters of State). The project would replace the existing culvert which requires access and construction activities within/to San Rafael Creek. Construction activities, including demolition of the existing culvert, installation of new culvert, and channel dewatering, would temporarily impact approximately 0.03 acre of waters (0.01 acre of intermittent stream, 0.02 acre of mixed riparian woodland). No permanent impact would occur. Areas of temporary impacts would return to waters upon the completion of construction. Due to the temporary nature of the project impacts lasting only a few months, the project work would not result in permanent or net loss of waters. Impacts would be less than significant.

In addition, the project would require a Clean Water Act Section 404 permit from the Corps, a section 401 water quality certification from the RWQCB, and a Lake and Streambed Alteration Agreement from CDFW. These agencies' permits would require no net loss of wetlands and likely require the implementation of additional BMPs during construction and restoration of impacted/removed vegetation following completion of construction activities, which further ensures that significant impacts would be avoided.

d) ***Less than Significant Impact.*** The proposed creek dewatering may temporarily affect the movement of aquatic species along San Rafael Creek, but the project site does not contain suitable habitat to support these species as discussed in Table 1. No aquatic species has potential to occur within the project site; therefore, impacts would be less than significant.

e) ***Less than Significant Impact.*** The City of San Rafael provides for the protection of street trees along any public street, sidewalk or walkway in the City (Ord. 972 § 2, 1970; Ord. 865 § 2, 1966: Ord. 609). The project site is not along any public street, sidewalk or walkway, and is not expected to impact or require the removal of any street trees. However, the project would require removal of one (1) tree on-site. The tree would be removed and/or replaced in accordance with the municipal code. Tree removal as a result of project implementation would not conflict with any local provisions for tree protection, and no significant impacts are anticipated.

f) ***No Impact.*** No state, regional, or federal habitat conservation plans or Natural Community Conservation Plans have been adopted for the project site.

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

The following analysis of cultural resource impacts is based on the Archaeological Survey Report prepared by Alta Archaeological Consulting, LLC (ALTA) on June 27, 2022 (Appendix A). Sources consulted for the report included a records search at the Northwest Information Center (NWIC), review of historic registers and maps, literature review, and a field survey.

Environmental Setting

The project area is situated within the Coast Range geologic province. The northern Coast Ranges are a geologic province comprised of numerous rugged north-south trending ridges and valleys that run parallel to a series of faults and folds. Formation of these ranges is generally attributed to events associated with subduction of the Pacific Plate beneath the western border of North America. The bedrock that underlies the region is a complex assemblage of highly deformed, fractured, and weathered sedimentary, igneous, and metamorphic rocks. The bedrock geology of the project area consists of Jurassic-Cretaceous age Franciscan Formation rock. Rocks of this formation, the oldest in the area, are often weakly metamorphosed, and consist of greywacke shale interspersed with discontinuous bodies of ultramafic rock such as greenstone, schist, and serpentine. The repeated folding and faulting are reflected in the complex structure of Franciscan rocks and area topography.[18]

Regulatory Setting

Federal and State criteria have been established for the determination of historical resource significance as defined in National Register (NR) criteria contained in National Register Bulletin 16

[18] *Alta Archaeological Consulting, LLC. Archaeological Survey Report for Rotary Manor Culvert Replacement. June 27, 2022.*

(U.S. Department of the Interior 1986:1) and for the purposes of CEQA under Section 5024.1(g) of the Public Resource Code and Section 15064.5 of the State CEQA Guidelines.

The National Historic Preservation Act (NHPA) applies to certain projects undertaken requiring approval by federal agencies. Property owners, planners, developers, as well as State and local agencies are responsible for complying with NHPA's requirements regarding the identification and treatment of historic and prehistoric cultural resources. Under NHPA, cultural resources must be evaluated to determine their eligibility for listing in the NR. If an archaeological resource is determined ineligible for listing on the NR, then the resource is released from management responsibilities and a project can proceed without further cultural resource considerations. Similarly, the CEQA applies to certain projects undertaken requiring approval by State and/or local agencies. Under CEQA, cultural resources must be evaluated to determine their eligibility for listing in the California Register of Historic Resources (CRHR). If a cultural resource is determined ineligible for listing on the CRHR the resource is released from management responsibilities and a project can proceed without further cultural resource considerations.

As set forth in Title 36, Part 63 of the Code of Federal Regulations, for a cultural resource to be deemed significant under the NHPA and thus eligible for listing on the NR, it must meet at least one of the following criteria:

(A) associated with events that have made a significant contribution to the broad patterns of our history; or
(B) associated with the lives of persons significant in our past; or
(C) embodies 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) yielded, or may be likely to yield, information important in prehistory or history.

Furthermore, in order to be considered eligible for listing on the NR, a property must retain aspects of integrity, or its ability to convey its historical significance. These aspects are as follows: Location, Design, Setting, Materials, Workmanship, Feeling, and Association.

As set forth in Section 5024.1(c) of the Public Resources Code for a cultural resource to be deemed "important" under CEQA and thus eligible for listing on the California Register of Historic Resources (CRHR), it must meet at least one of the following criteria:

(1) is associated with events that have made a significant contribution to the broad patterns of California History and cultural heritage; or
(2) is associated with the lives of persons important to our past; or
(3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possess high artistic value; or
(4) has yielded or is likely to yield, information important to prehistory or history.

Archaeological resources are commonly evaluated with regard to Criteria D/4 (research potential).

Historic-era structures older than 50 years are most commonly evaluated in reference to Criteria 1/A (important events), Criteria B/2 (important persons) or Criteria C/3 (architectural value). To be considered eligible under these criteria the property must retain sufficient integrity to convey its important qualities. Integrity is judged in relation to seven aspects including: location, design, setting, materials, workmanship, feeling, and association.

Discussion of Impacts

a) and b) ***Less than Significant with Mitigation Incorporated.*** Pursuant to State CEQA Guideline 15064.5, the San Rafael General Plan 2040 (Community Design and Preservation and Arts and Culture Elements) was consulted to identify any National, State, or Local historical landmarks within the project site. The project site does not contain any resource listed as one of the 25 historic resources identified in the San Rafael General Plan 2040. Review of historic registers and inventories indicate that no listed historical landmarks or points of interest are present within the project area. There are four (4) NR listed properties and four (4) local landmarks located within the 0.5-mile radius of the Area of Potential Effect (APE).

A records search identified seven (7) cultural resources have been previously reported within the 0.5-mile radius of the APE, including one (1) prehistoric and six (6) historic-era resources. However, no cultural resources are documented within the project area limits.

ALTA archaeologist contacted the Native American Heritage Commission (NAHC) on January 14, 2020, to request a review of the Sacred Lands file for information on Native American cultural resources in the APE and to request a list of Native American contacts in the area. The NAHC response dated January 21, 2020, indicates a negative result of the search of the Sacred Land file.

ALTA staff archaeologist and the Federated Indians of Graton Rancheria (FIGR) cultural monitor conducted a field survey of the APE on June 17, 2022. Project design drawing, project maps and aerial imagery were used to correctly identify the APE. Ground surface visibility was generally poor (approximately 20 percent) due to pavement areas, grass, a spoils pile, and landscaping plants and materials. No cultural resources were identified within the project area limits during the field survey.

As discussed above, there are no cultural resources are documented within the project area limited. No impact to previously documented cultural resources would occur. However, the potential for encountering previously undiscovered cultural resources cannot be completely eliminated. Under Mitigation Measure CUL-1, identification of previously undiscovered cultural resources during project construction would require a qualified professional archaeologist to be contacted to evaluate any encountered cultural resources and no project personnel should collect cultural resources. With implementation of Mitigation Measure

CUL-1, the project would not cause a substantial adverse change in the significance of a cultural resource. Impacts would be less than significant with mitigation incorporated.

Mitigation Measure CUL-1: If previously unidentified cultural resources are encountered during project construction, the contractor shall avoid altering the materials and their stratigraphic context. A qualified professional archaeologist shall be contacted to evaluate the situation. Project personnel shall not collect cultural resources. Prehistoric resources include, but are not limited to, chert or obsidian flakes, projectile points, mortars, pestles, and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic resources include stone or abode foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

c) ***Less than Significant Impact with Mitigation Incorporated.*** No evidence of human remains was identified within the project area during the records search or field survey; however, the potential for the presence of human remains cannot be eliminated entirely. Disturbance of previously undiscovered human remains during construction would result in a potentially significant impact. In the event human remains are discovered, Mitigation Measure CUL-2 requires stop work and adherence to appropriate notification and evaluation protocols, which would ensure that impacts remain less than significant. Therefore, the potential impact on human remains would be less than significant with mitigation incorporated.

Mitigation Measure CUL-2: Although unlikely, if human remains are encountered, all work must stop in the immediate vicinity of the discovered remains and the County Coroner and a qualified archaeologist must be notified immediately so that an evaluation can be performed. If the remains are deemed to be ancestral Native American, the County Coroner shall contact the NAHC. The NAHC will designate the Most Likely Descendant (MLD), who has legal jurisdiction as the proper treatment and disposition of remains. The City (lead agency) shall consult with the MLD to solicit their recommendations regarding treatment of the remains.

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

Environmental Setting

Total energy consumed per capita in California was approximately 198 trillion British thermal units (Btu) in the year 2019, the most recent year for which this data was available.[19] Out of the 50 states, California is ranked 12th in total energy production and 50th in energy consumption per capita. The breakdown by sector was approximately 18.7 percent (1,455 trillion Btu) for residential uses, 18.8 percent (1,468 trillion Btu) for commercial uses, 23.2 percent (1,805 trillion Btu) for industrial uses, and 39.3 percent (3,058 trillion Btu) for transportation.[20] This energy is primarily supplied in the form of natural gas, petroleum, nuclear electric power, and hydroelectric power.

Fuel and Motor Vehicles

In 2019, 15.4 billion gallons of gasoline were sold in California.[21] The average fuel economy for light-duty vehicles (autos, pickups, vans, and sport utility vehicles) in the United States has steadily increased from about 13.1 miles per gallon (mpg) in the mid-1970s to 24.9 mpg in 2019.[22] Federal fuel economy standards have changed substantially since the Energy Independence and Security Act was passed in 2007. That standard, which originally mandated a national fuel economy standard of 35 miles per gallon by the year 2020, was updated in March 2020 to require all cars

[19] *United States Energy Information Administration. "State Profile and Energy Estimates, 2019." Available at: https://www.eia.gov/state/rankings/?sid=CA#/series/101. Accessed May 27, 2022*

[20] *Ibid.*

[21] *California Department of Tax and Fee Administration. "Net Taxable Gasoline Gallons." https://www.cdtfa.ca.gov/dataportal/dataset.htm?url=VehicleTaxableFuelDist. Accessed August 4, 2021.*

[22] *EPA. "The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975." January 2021.*

and light duty trucks achieve an overall industry average fuel economy of 40.4 mpg by model year 2026. [23, 24]

Electricity

In 2020, a total of approximately 1,330 gigawatt hours (GWh) of electricity was consumed in Marin County.[25]

Given the nature of the proposed project, the main uses of energy would occur via construction vehicle fuel.

City of San Rafael

The City of San Rafael receives its electricity from Pacific Gas & Electric Company (PG&E), a natural gas and electric utility, as well as Marin Clean Energy (MCE), which supplies customers with 50 to 100% renewable energy as an alternative to PG&E. MCE's 100% renewable electricity program is called Deep Green, and it supplies non-polluting wind and solar power for public buildings, streetlights, and other civic accounts in Marin County. San Rafael chose to join the Deep Green program in 2018.

Regulatory Setting

Federal and state agencies regulate energy use and consumption through various means and programs. At the federal level, the United States Department of Transportation, the United States Department of Energy, and the United States Environmental Protection Agency (EPA) are three federal agencies with substantial influence over energy policies and programs. Generally, federal agencies influence and regulate transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure improvements.

At the state level, the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) are two agencies with authority over different aspects of energy. The CPUC regulates privately owned utilities in the energy, rail, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes, and funds energy efficiency programs, and adopts and enforces appliance

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[23] *United States Department of Energy. Energy Independence & Security Act of 2007. http://www.afdc.energy.gov/laws/eisa. Accessed August 4, 2021.*

[24] *Public Law 110–140—December 19, 2007. Energy Independence & Security Act of 2007. http://www.gpo.gov/fdsys/pkg/PLAW-110publ140/pdf/PLAW-110publ140.pdf.*

[25] *California Energy Commission. Energy Consumption Data Management System. "Electricity Consumption by Countyhttp://ecdms.energy.ca.gov/elecbycounty.aspx." Accessed May 27, 2022.*

and building energy efficiency standards. California is exempt under federal law from rules that otherwise would preempt setting state fuel economy standards for new on-road motor vehicles. Some of the more relevant federal and state energy-related laws and plans are discussed below.

Federal Regulations

Energy Policy Act of 2005

Passed by Congress in July 2005, the Energy Policy Act includes a comprehensive set of provisions to address energy issues. The act includes tax incentives for the following: energy conservation improvements in commercial and residential buildings; fossil fuel production and clean coal facilities; and construction and operation of nuclear power plants, among other things. Subsidies are also included for geothermal, wind energy, and other alternative energy producers. It directs the USDOE to study and report on alternative energy sources such as wave and tidal power and includes funding for hydrogen research. The Act also increases the amount of ethanol required to be blended with gasoline and extends daylight saving time (to begin earlier in spring and end later in fall) to reduce lighting requirements. It also requires the federal vehicle fleet to maximize use of alternative fuels. The Act further includes provisions for expediting construction of major energy transmission corridors, such as high-voltage power lines, and fossil fuel transmission pipelines. These are just a few examples of the provisions contained in the Act.[26]

Energy Independence and Security Act of 2007

Signed into law in December 2007, this broad energy bill included an increase in auto mileage standards, and also addressed biofuels, conservation measures, and building efficiency. The U.S. EPA administers the Corporate Average Fuel Economy (CAFE) program, which determines vehicle manufacturers' compliance with existing fuel economy standards. The bill amended the CAFE standards to mandate significant improvements in fuel efficiency (i.e., average fleet wide fuel economy of 35 miles per gallon (mpg) by 2020, versus the previous standard of 27.5 mpg for passenger cars and 22.2 mpg for light trucks).[27]

Another provision includes a mandate to increase use of ethanol and other renewable fuels by 36 billion gallons by 2022, of which 21 million gallons is to include advanced biofuels, largely cellulosic ethanol, that have 50 to 60 percent lower Greenhouse Gas (GHG) emissions. The bill also includes establishment of a new energy block grant program for use by local governments in implementing

[26] *United States Congress, Energy Policy Act of 2005 (Public Law 109-58), passed July 29, 2005. https://www.congress.gov/bill/109th-congress/house-bill/6*

[27] *EPA. Summary of the Energy Independence and Security Act. 2007. Available online at: https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act*

energy-efficiency initiatives, as well as a variety of green building incentives and programs, among other things.[28]

State Regulations

Energy Action Plan

In 2003, the three key energy agencies in California— the CEC, the California Power Authority (CPA), and the CPUC— jointly adopted an Energy Action Plan (EAP) that listed goals for California's energy future and set forth a commitment to achieve these goals through specific actions. In 2005, the CPUC and the CEC jointly prepared the EAP II to identify the further actions necessary to meet California's future energy needs. The EAP II describes the priority sequence for actions to address increasing energy needs, also known as "loading order." The loading order identifies energy efficiency and demand response as the state's preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, the state is to rely on renewable sources of power and distributed generation, such as combined heat and power applications. To the extent that efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, the EAP II supports the use of clean and efficient fossil fuel-fired generation.

Title 24 (California Energy Code)

The California Energy Code (Title 24, Part 6, of the California Code of Regulations, California's Energy Efficiency Standards for Residential and Nonresidential Buildings), provides energy conservation standards for all new and renovated commercial and residential buildings constructed in California. The provisions of the California Energy Code apply to the building envelope, space-conditioning systems, and water-heating and lighting systems of buildings and appliances; they also give guidance on construction techniques to maximize energy conservation. Minimum efficiency standards are given for a variety of building elements, including appliances; water and space heating and cooling equipment; and insulation for doors, pipes, walls, and ceilings. The CEC adopted the 2005 changes to the Building Efficiency Standards, which emphasized saving energy at peak periods and seasons, and improving the quality of installation of energy-efficiency measures. It is estimated that implementation of the 2005 Title 24 standards have resulted in an increased energy savings of 8.5 percent relative to the previous Title 24 standards. Compliance with Title 24 standards is verified and enforced through the local building permit process.[29] The 2008 Title 24 Standards, which had an effective date beginning August 1, 2009, include added provisions that require, for example, "cool roofs" on commercial buildings; increased efficiency in heating, ventilating, and air conditioning systems; and increased use of skylights and more efficient

[28] *Ibid*

[29] *California Energy Commission (2016) Web site (Building Efficiency Standards), http://www.energy.ca.gov/title24*

lighting systems.[30] Title 24 Standards were further updated with the 2013 Building Energy Efficiency Standards, which are estimated to lead to 25 percent less energy consumption for residential buildings and 30 percent savings for nonresidential buildings over 2008 Energy Standards. 2013 standards, which updated codes for lighting, space heating and cooling, ventilation, and water heating, took effect on July 1st, 2014.

California Green Building Standards Code

All new construction must adhere to the California Green Building Standards Code (CCR, Title 24, Part 11) in place at the time of construction. As an example, the 2013 Title 24 California Green Building Standards, referred to as CALGreen:

- Sets a threshold of a 20 percent reduction in indoor water use and includes voluntary goals for reductions of 30 percent, 35 percent, and 40 percent.
- Requires separate meters for indoor and outdoor water use at nonresidential buildings; and at those sites, irrigation systems for larger landscaped areas must be moisture-sensing.
- Calls for 50 percent of construction waste to be diverted from the landfills and lists higher, voluntary diversion amounts of 65 percent to 75 percent for new homes, and 80 percent for commercial construction.
- Mandates inspections of energy systems -- such as the heat furnace, air conditioning, and mechanical equipment -- for nonresidential buildings that are larger than 10,000 square feet to "ensure that all are working at their maximum capacity according to design efficiencies."
- Requires that paint, carpet, vinyl flooring, particle board, and other interior finish materials be low-emitting in terms of pollutants.

California Global Warming Solutions Act of 2006

In September 2006, the governor signed AB 32, the Global Warming Solutions Act of 2006, which mandates that California's GHG emissions be reduced to 1990 levels by 2020. The act directs the California EPA to work with state agencies to implement a cap on GHG emissions (primarily carbon dioxide) from stationary sources of such as electric power generation facilities, and industrial, commercial, and waste-disposal sectors. Since carbon dioxide emissions are directly proportional to fossil fuel consumption, the cap on emissions is expected to have the incidental effect of forcing a reduction in fossil fuel consumption from these stationary sources. Specifically, AB 32 directs the California EPA to work with other state agencies to accomplish the following: 1) promulgate and implement GHG emissions cap for the electric power, industrial, and commercial sectors through regulations in an economically efficient manner; 2) institute a schedule of greenhouse gas

[30] *Ibid.*

reductions; 3) develop an enforcement mechanism for reducing GHG; 4) establish a program to track and report GHG emissions.[31]

Senate Bill 32

Enacted in 2016, Senate Bill (SB) 32 (Pavley, 2016) codifies the 2030 GHG emissions reduction goal of Executive Order B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. Similar to AB 32, a reduction in GHG emissions typically corresponds with a reduction in energy usage as the bulk of GHGs result from the combustion of fossil fuel.

SB 32 was coupled with a companion bill: AB 197 (Garcia, 2016). Designed to improve the transparency of CARB's regulatory and policy-oriented processes, AB 197 created the Joint Legislative Committee on Climate Change Policies, a committee with the responsibility to ascertain facts and make recommendations to the Legislature concerning statewide programs, policies and investments related to climate change. AB 197 also requires CARB to make certain GHG emissions inventory data publicly available on its web site; consider the social costs of GHG emissions when adopting rules and regulations designed to achieve GHG emission reductions; and include specified information in all Scoping Plan updates for the emission reduction measures contained therein.

Senate Bill 1389

In 2002, the Legislature passed Senate Bill 1389, which required the CEC to develop an integrated energy plan every two years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. The CEC recently adopted the 2021 Integrated Energy Policy Report.[32] The 2021 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. *Local Regulations*

In addition to federal and state regulations and guidelines, the following is a synopsis of local City of San Rafael regulations and goals relative to reducing or avoiding significant impacts on energy use.

[31] *Assembly Bill 32, Passed August 31, 2006, http://www.arb.ca.gov/cc/docs/ab32text.pdf.*

[32] *California Energy Commission. 2021. 2021 Integrated Energy Policy Report. California Energy Commission. Docket # 21-IEPR-01. February*

City of San Rafael General Plan 2040

Policy C-4.2: Energy Conservation. Support construction methods, building materials, and home improvements that improve energy efficiency in existing and new construction.

Policy C-4.5 Resource Efficiency in Site Development. Encourage site planning and development practices that reduce energy demand and incorporate resource- and energy-efficient infrastructure.

Discussion of Impacts

a) ***Less than Significant Impact.*** The proposed project would require the use of diesel and other fuels for trucks and equipment during construction, but these activities would be short-term and completed as efficiently as possible for practical and financial reasons, among other considerations. This is a culvert replacement project that would not require ongoing energy consumption in the operational phase in excess of the current baseline condition. Therefore, construction and operation of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources, and impacts in this regard would be less than significant.

b) ***Less than Significant Impact.*** The proposed project would replace an existing CMP Culvert with a new RCB Culvert. The degree of energy consumption from the new culvert would not change from current baseline conditions. Furthermore. as indicated above, energy usage in the project area during construction would be relatively small in comparison to the State's available energy sources and energy impacts would be negligible at the regional level. Once operational, the proposed project would not increase energy use. Since California's energy conservation planning actions are conducted at a regional level, and because the project's total impact to regional energy supplies would be minor, the proposed project would not conflict with California's energy conservation plans as described in the 2021 Integrated Energy Policy Report. Thus, as shown above, the project would avoid or reduce the inefficient, wasteful, and unnecessary consumption of energy and not result in any irreversible or irretrievable commitments of energy. Impacts would be less than significant.

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

Environmental Setting

Regional Geologic Setting

The project site lies within the Coast Ranges geomorphic province of California. Regional topography within the Coast Ranges province is characterized by northwest-southeast trending mountain ridges and intervening valleys that parallel the major geologic structures, including the San Andreas Fault System. The province is also generally characterized by abundant land sliding and erosion, owing in part to its typically high levels of precipitation and seismic activity.

Earthquakes are the product of the build-up and sudden release of strain along a "fault" or zone of weakness in the earth's crust. Stored energy may be released as soon as it is generated, or it may be accumulated and stored for long periods of time. Faults are seldom single cracks in the earth's crust but are typically comprised of localized shear zones which link together to form larger fault zones. Within the Bay Area, faults are concentrated along the San Andreas fault system, which extends nearly 700 miles along a northwest trend from Mexico to offshore northern California. The movement between rock formations along either side of a fault may be horizontal, vertical, or a combination and is radiated outward in the form of energy waves. The amplitude and frequency of earthquake ground motions partially depends on the material through which it is moving. The earthquake force is transmitted through hard rock in short, rapid vibrations, while this energy becomes a long, high-amplitude motion when moving through soft ground materials.

An "active" fault is one that shows displacement within the last 11,000 years (i.e., Holocene) and has a reported average slip rate greater than 0.1 mm per year. The California Division of Mines and Geology (1998) has mapped various active and inactive faults in the region. The nearest known active faults to the site are the San Andreas and Hayward Faults.

Local Geologic Setting

The subsurface conditions of the project site consist of predominantly sandy and clayey alluvial soils. The sandy soils are generally loose to medium dense, while the clayey soils are generally stiff to very stiff (Appendix C).[33] While not identified during the geotechnical investigation for the project, it is likely that some of the near-surface soils consist of fill which was derived from native soils that were reworked during previous site grading and culvert construction.[34]

The project site, like all properties in the San Francisco Bay area, is situated in a seismically active area. In the San Francisco Bay Area, the San Andreas fault system includes the San Andreas, Hayward, Calaveras, and other related faults in the San Francisco Bay area. According to the U.S. Geological Survey (Working Group on California Earthquake Probabilities 2003), there is a 62%

[33] *Miller Pacific Engineering Group. Geotechnical Investigation for the Rotary Manor Culvert Replacement Project. April 12, 2021.*

[34] *Ibid.*

chance of at least a magnitude 6.7 (or greater) earthquake in the San Francisco Bay region between 2003 and 2032.

The project site is not located in the vicinity of any active earthquake faults. The San Andreas, San Gregorio, and Hayward Faults are the nearest known active faults to the project site. The San Andreas and San Gregorio Faults are located approximately 8.5 miles and 9.3 miles southwest of the project site, respectively. The Hayward Fault is approximately 9 miles to the northeast of the project site.

Discussion of Impacts

a-i,) ***No Impact.*** The project site is not located within a State of California designated Alquist-Priolo Earthquake Fault Zone.[35] Earthquake fault zones are regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. The closest active faults to the site are the San Andreas and San Gregorio Faults located approximately 8.5 miles and 9.3 miles southwest of the project site, respectively, and the Hayward Fault located approximately 9 miles northeast of the project site. No faults cross through the project site, and surface rupture associated with a fault is not anticipated in the City. No impacts would occur.

a-ii) ***Less than Significant Impact.*** The project site and the entire San Francisco Bay Area are located in a seismically active region subject to strong seismic ground shaking. Ground shaking is general term referring to all aspects of motion of the earth's surface resulting from an earthquake and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. The most significant adverse impact associated with strong seismic shaking is potential damage to structures and improvements. The project would not include construction of habitable structures. However, the project construction phase would increase the use of the project site and result in the construction of improvements in areas subject to seismic shaking. The risk of ground shaking impacts would be reduced through adherence to the design and materials standards set forth in building codes. Structures associated with the proposed project would be designed to conform to the most recent edition of the California Building Code (2019) and to the recommendations provided by the Geotechnical Investigation for the project (Appendix C). Given these legal obligations, the impacts related to this topic would be less than significant.

a-iii) ***Less than Significant Impact.*** Liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, such as seismic shaking, which causes a solid to behave like a liquid. Soils susceptible to liquefaction are saturated, loose, granular deposits. Liquefaction can result in flow failure, lateral

[35] *Ibid.*

spreading, ground movement, settlement, and other related effects. Buried pipelines embedded within liquefied soils may also experience uplift due to buoyancy.

The California Geological Survey (CGS) has mapped Seismic Hazard Zones that delineate areas susceptible to liquefaction and/or landslides that require proposed new developments in these areas to conduct additional investigation to determine the extent and magnitude of potential ground failure. According to mapping by CGS, the project is located in an area that has not been evaluated for liquefaction or landslides.[36] Mapping performed by Metropolitan Transportation Commission/Association of Bay Area Governments (MTC/ABAG) indicates that the project site is located in an area with very low and moderate liquefaction susceptibility.[37] The Geotechnical Investigation for the project (Appendix C) provides recommendation regarding the criteria for fill material and compaction requirement. Implementing the geotechnical recommendations for the project would reduce liquefaction impact to less than significant.

a-iv) ***Less than Significant Impact.*** Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes in areas with significant ground slopes. The project stie is relatively level. No substantial natural slopes exist on the project site. However, the project site does include a segment of San Rafael Creek, a pervious area, which consists of an earthen channel. The contractor will implement BMPs (e.g., installation of silt fence, cofferdam, and geotextile) around the work area, which would provide erosion control and prevent landslides from occurring. The impact associated with landslides would be less than significant.

b) ***Less than Significant Impact.*** Construction would involve limited soil disturbance, which could temporarily expose soils to wind and water erosion. The total area of disturbance would be approximately 0.17 acre. Construction activities in the creek would be restricted to the creek bed within 20 feet of the culvert end wall. As discussed in the Project Description, the contractor will implement BMPs (e.g., installation of silt fence, cofferdam, and geotextile) around the work area, which would provide erosion control. Due to the limited soil disturbance and implantation of BMPs the impacts related to erosion would be less than significant.

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[36] *California Geological Survey. Data Updated February 11, 2022. https://gis.data.ca.gov/datasets/b70a766a60ad4c0688babdd47497dbad_0/explore?location=37.861916%2C-122.317056%2C9.68. Accessed May 27, 2022.*

[37] *Metropolitan Transportation Commission/Association of Bay Area Governments. MTC/ABAG Hazard Viewer Map. Accessed May 27, 2022. https://mtc.maps.arcgis.com/apps/webappviewer/index.html?id=4a6f3f1259df42eab29b35dfcd086fc8*

c, d) ***Less than Significant Impact.*** The potential for geologic and soil hazards from unstable or expansive soils in the project site is considered low based on the geologic units, soil types, and flat topography discussed previously. The ground disturbance associated with the proposed project would cause soil disturbance, but these actions would not result in substantial changes in topography, ground surface relief features, or geologic substructures, and would therefore not change the stability of the soil conditions. The project would implement BMPs, such as installation of silt fence, cofferdam, and geotextile around the work area, to provide erosion control. Furthermore, the project is subject to all Federal, State, and local regulations and standards for seismic conditions including the California Building Code and would be designed to conform to all building requirements. Therefore, the proposed project's impacts would not destabilize the soil or expose human life or structures to increased risk of on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. Impacts in these areas would be less than significant.

e) ***No Impact.*** The project does not involve construction of septic tanks or alternative wastewater disposal systems.

f) ***Less than Significant Impact.*** The project site follows mainly existing rights-of-way on graveled and previously disturbed land. Excavation of soil would be required; however, the site has been disturbed during previous site grading and construction of the existing culvert. The project site is unlikely to contain any paleontological resources. The ground disturbance associated with the project would not change the topography or geologic substructures of the vicinity and would therefore not change any unique geologic features. Impacts would be less than significant.

VII. **GREENHOUSE GAS EMISSIONS** — Would the project:		*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b)	Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Environmental Setting

Greenhouse gases (GHGs) are heat-trapping gases that, when emitted to the earth's atmosphere, contribute to an abnormally fast rate of planetary warming. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. In GHG emission inventories, the weight of each gas is multiplied by its global warming potential (GWP) and is measured in units of CO_2 equivalents (CO_2e). The most common GHGs are carbon dioxide (CO_2) and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO_2 and N_2O are byproducts of fossil fuel combustion.
- N_2O is associated with agricultural operations such as fertilization of crops.
- CH_4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents, but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and SF_6 emissions are commonly created by industries such as aluminum production and semiconductor manufacturing.

An expanding body of scientific research supports the theory that global climate change is currently causing changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California are adversely affected by the global warming trend. Increased precipitation and sea level rise will increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more

frequent and intense natural disasters such as flooding, hurricanes and drought; and increased levels of air pollution.

Unlike emissions of criteria and toxic air pollutants, which have regional and local impacts, emissions of GHGs have a broader, global impact. Global warming is a process whereby GHGs accumulating in the upper atmosphere contribute to an increase in the temperature of the earth and changes in weather patterns.

The main source of GHG emissions result from vehicle trips associated with the construction and maintenance of the proposed project.

Regulatory Setting

Assembly Bill (AB) 32, adopted in 2006, established the Global Warming Solutions Act of 2006 which requires the State to reduce GHG emissions to 1990 levels by 2020. Senate Bill 97, adopted in 2007, requires the Governor's Office of Planning and Research to develop CEQA guidelines for the mitigation of GHG emissions, and the Resources Agency certified and adopted the amendments to the guidelines on December 30, 2009. According to CEQA Guidelines Section 15064.4, the lead agency may quantitatively or qualitatively assess the project's impact on greenhouse gas emissions. The lead agency should consider the project's reasonably foreseeable incremental contribution to the effects of climate change using evolving scientific knowledge, state regulatory schemes, and an appropriate timeframe for the project.

The Marin Climate Action Plan outlines goals and policies for reducing GHG emissions and adapting to climate change in Marin County. The Plan targets a more aggressive emission reduction goal than the Statewide AB 32 target, calling for a 30% reduction below 1990 emission levels by 2020. In 2012, unincorporated Marin County emitted approximately 477,000 metric tons (MT) CO2e, approximately 7.1 metric tons per capita. The plurality of these emissions are from on-road transportation and building energy (35% each), with the next greatest sources of emissions being agriculture (23%), off-road equipment (4%), solid waste treatment (2%), wastewater treatment (1%), and water conveyance (0.2%).[38]

The City of San Rafael Climate Change Action Plan was originally adopted in 2009 and provides programs and policies that would meet the State's AB 32 goal for local government actions by achieving a 15% reduction in San Rafael's GHG emissions. The Plan targets a total GHG reduction of 25% by 2020, and an ambitious 80% reduction by 2050 in order to meet targets set by the State of California. The City approved a new updated Plan in 2019 called the Climate Change Action Plan 2030 (CCAP 2030), which establishes targets similar to the State's goals to reduce emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. In San Rafael, that means emissions

[38] *Marin County and ICF International, "Marin County Climate Action Plan," July 2015, Available at: <https://www.marincounty.org/-/media/files/departments/cd/planning/sustainability/climate-and-adaptation/execsummarymarincapupdate_final_20150731.pdf?la=en>.*

would need to drop to 241,455 MT CO2e by 2030 and 80,485 MT CO2e by 2050. The CCAP 2030 lays out measures that will exceed the 2030 target and put the City on a trajectory to meet the 2050 goal.[39] The CCAP 2030 outlines the steps that residents, businesses, and the City can take to reach that goal. The CCAP 2030 has been prepared pursuant to CEQA Guidelines Section 15183.5 and is considered a Qualified Greenhouse Gas Reduction Plan for streamlining CEQA analysis. In 2011, the City of San Rafael adopted a new Sustainability Element for General Plan 2020 that allows the City to use the CCAP as a quantified GHG Reduction Strategy and streamline the analysis of future projects under CEQA.

Discussion of Impacts

a) ***Less Than Significant Impact.*** GHG emissions from the project would be produced from operation of the construction-related equipment. Based on the nature of the project and short duration of construction, GHG emissions resulting from construction activities would be both minor and temporary. While the project would have an incremental contribution to GHG emissions within the City and region, the individual impact is less than significant. The degree of operational energy consumption due to the replaced culvert would not be changed from current baseline conditions. The proposed project would involve replacing the corroded CMP culvert with a new RCB culvert which would maintain existing stormwater conveyance and flood control in the surrounding residential areas. Less than significant impacts would occur.

b) ***Less Than Significant Impact.*** Pursuant to AB 32, the State of California is required to reduce GHG emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050. These reductions are to be attained through a statewide effort, so local jurisdictions throughout the State have created Climate Action Plans to put forth strategies and policies for their community to attain AB 32 requirements.

Marin County's Climate Action Plan was approved in 2015 and contains various strategies to reduce greenhouse gas emissions in the County. These actions are broadly divided into the categories of energy efficiency and renewable energy; land use, transportation, and off-road equipment; water conservation and wastewater treatment; waste reduction, reuse, and recycling; and agriculture. Policies relevant to the project generally include land use, water conservation, and energy efficiency policies. In general, these policies call for compact land use and infill development and use of water- and energy-efficient infrastructure.

The City of San Rafael Climate Change Action Plan establishes targets similar to the State's goals to reduce emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by

[39] *City of San Rafael "Climate Change Action Plan 2030," May 2019, Available at: <https://storage.googleapis.com/proudcity/sanrafaelca/uploads/2019/06/Att-D-CCAP-2030-Final-Draft-4-23-19.pdf> Accessed on June 23, 2020.*

2050. The updated CCAP includes a quantified GHG Reduction Strategy and monitoring program.

The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. GHG emissions from off-road equipment and utility electrical usage are identified and planned for in the Marin County Climate Action Plan as well as the San Rafael CCAP 2030. As mentioned above, both plans target a more aggressive emission reduction goal than the Statewide AB 32 target. The project would generate emissions similar to existing conditions and, therefore, impacts would be less than significant.

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

Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in 22 CCR Section 66261.10 as a substance with physical, chemical, or infectious characteristics which may cause or contribute to mortality or illness or pose a threat to human health or the environment when mismanaged. Chemical and physical properties which may cause a substance to be considered hazardous include toxicity, ignitability, corrosivity, and reactivity.

Under California Government Code Section 65962.5, the California Department of Toxic Substances Control (DTSC) maintains a list of hazardous substance sites. This list, referred to as the "Cortese List", includes CALSITE hazardous material sites, sites with leaking underground storage tanks, and landfills with evidence of groundwater contamination. The State Water Resource Control Board (State Water Board) GeoTracker database similarly documents hazardous waste sites throughout the state but focuses on groundwater contamination. Based on a review of the GeoTracker database, there are three sites listed as leaking underground storage tank (LUST) cleanup sites and one site listed as cleanup program stie within 0.25 mile of the project stie.[40] The cleaning status for all four sites were deemed completed between 1993 and 2006.[41] There are no sites in the City listed on the Cortese List.[42] No hazardous sites were identified within 0.25 mile of the project site in the Department of Toxic Substances Control's (DTSC's) EnviroStor database.[43] The nearest hazardous site is the Former Maxim Gas Plant Office, which is approximately 0.6 mile southeast of the project site. Cleanup of the site was deemed complete upon issuance of a No Further Action Letter by DTSC on June 29, 2010.[44]

Discussion of Impacts

a) ***Less than Significant Impact.*** Construction equipment and vehicles would use a minimal amount of hazardous materials. Hazardous materials present during project construction may include gasoline, diesel fuel, hydraulic oils, equipment coolants, and any generated wastes that may include these materials. Gasoline and diesel fuel would be stored in small quantities at the staging areas during construction and fueling of some equipment and

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[40] *State Water Resources Control Board. GeoTracker Database. Available at https://geotracker.waterboards.ca.gov/map/. Accessed May 31, 2022.*

[41] *Ibid.*

[42] *Department of Toxic Substances Control, Hazardous Waste and Substances Site List – Site Cleanup (Cortese List), Accessed May 31, 2022. https://dtsc.ca.gov/dtscs-cortese-list/*

[43] *Department of Toxic Substances Control, "EnviroStor Database," Accessed May 31, 2022. https://www.envirostor.dtsc.ca.gov/public/map/*

[44] *Ibid.*

vehicles would be performed on-site. Construction activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. Workers handling hazardous materials are required to adhere to federal Occupational Health and Safety Administration (OSHA) and California OSHA (Cal/OSHA) health and safety requirements. Hazardous materials must be transported to and from the project site in accordance with Resource Conservation and Recovery Act (RCRA) and U.S. Department of Transportation regulations. Although a spill or leak of hazardous materials is unlikely, a spill or leak has the potential to contaminate the waterway. As discussed in the Project Description, no re-fueling or maintenance of equipment would be conducted within the creek and the contractor would implement BMPs (e.g., installation of silt fence) to prevent fine sediment dropping into the creek. With implementation of the project measures and compliance with existing regulations, the potential impact related to routine transport of hazardous materials would be less than significant.

Project operation and maintenance activities would be similar to existing conditions. These activities would require occasional site visits using vehicles that would use fuel and oil. Similar to the use of equipment during construction activities described above, the contractor and the City would be required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. With compliance with existing regulations, the potential operational impacts would be less than significant.

b) ***Less than Significant Impact.*** Demolition of the existing culvert would generate asbestos-cement drain pipe which is asbestos contaminated material (ACM). ACM could be released into the environment, including the San Rafael Creek during construction. Deposition of ACM into San Rafael Creek and the surrounding environment would be a significant impact. Demolition, removal, and disposal of ACM are required to comply with the following existing regulatory requirements:

Bay Area Air Quality Management District

The Contractor shall comply with the Bay Area Air Quality Management District's (BAAQMD's) Regulation 11 Rule 2, which provides guidelines for the proper removal and disposal of asbestos-containing material. Regulation 11-2-401.3 requires that for every demolition (even when no asbestos is present), a notification must be made to the BAAQMD

at lease 10 working days (except in special circumstances) prior to commencement of demolition. The notification shall be prepared in accordance with the information required per Regulation 11-2-401.3.

California Health and Safety Code and California Code of Regulations

The demolition contractor shall comply with the California Health and Safety Code (Section 39650 et seq.) and the California Code of Regulations (Title 8, Section 1529), which prohibit emission of asbestos from asbestos-related demolition or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for the release of asbestos fibers; and require notice to federal and local government agencies prior to beginning renovation or demolition that could disturb asbestos.

Compliance with the above-described regulations would ensure that impacts related to release of ACM during demolition to a less-than-significant level.

c) ***Less Than Significant Impact.*** The closest school to the proposed project site is the Mariposa Bilingual School, located 0.17 mile southwest of the culvert. Fuels, lubricants, and any other potentially hazardous materials used during proposed project construction would be in such small quantities and handled carefully in compliance with all applicable laws and regulations that it would have little to no chance of affecting the school. Although the Mariposa Bilingual School is within a 0.25 mile of the proposed project site, there is a less than significant impact that the school would be affected by the use of fuels, lubricants, and other chemicals on the proposed project site.

d) ***No Impact.*** The provisions of Government Code Section 65962.5 require the State Water Resources Control Board, DTSC, California Department of Health Services, and California Department of Resources Recycling and Recovery to submit information to the California Environmental Protection Agency pertaining to sites that were associated with solid waste disposal, hazardous waste disposal, and/or hazardous materials releases. The compilation of hazardous materials release sites that meet criteria specified in Section 65962.5 of the California Government Code is known as the Cortese List.

No active sites in or around the project site are listed on the State Water Board's Geotracker and DTSC's EnviroStor databases. There are also currently no hazardous materials release sites on the project site that meet the criteria for inclusion on the Cortese List. Therefore, the project would have no impacts related to development on a hazardous materials release site included on the Cortese List.

e) ***No Impact.*** The project site is located more than 3 miles south of the nearest airport, the San Rafael Airport (a private use airport). Gnoss Field is the nearest public use airport, located more than 14 miles to the north of the project site. The project site is not located

within an airport influence area; therefore, project structures would not be considered a potential obstruction to aircraft. Furthermore, the project would not result in a substantial increase in bird populations, solar glare, misleading lighting, or other visual impairments in proximity to the airport's approach and departure zones. Therefore, the project would have no impacts on the navigable airspace of public use airports and would not result in a safety hazard for people residing or working in the project area.

f) ***Less than Significant Impact.*** Marin County maintains an Emergency Operations Plan that provides information for emergency management, personnel responsibilities, and procedure before, during, and after major event. In 2017, the City of San Rafael prepared a Local Hazard Mitigation Plan (LHMP) to guide hazard mitigation planning to better protect the people and property of the City from the effects of hazard events. The San Rafael LHMP provides information to help guide and coordinate mitigation activities and decisions for future local land use policy.[45] The project site is located within Rotary Manor, a developed private property for senior housing, and would involve replacement of an existing culvert. The project would not negatively alter or obstruct any roadways in the project vicinity and would not alter the current use of the project site. Implementation of the project would not interfere with the Marin County Emergency Operations Plan or the San Rafael LHMP. The impact would be less than significant.

g) ***Less than Significant Impact.*** The project site is located a developed urban area and is surrounded by paved urbanized uses. The project site is located within a Local Responsibility Area not a State Responsibility Area. No Moderate, High, or very Hight Fire Hazard Severity Zone is located in the vicinity of the project site.[46] Therefore, the project would not expose people or structures to a significant loss, injury or death involving fires and the impact would be less than significant.

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[45] *City of San Rafael. San Rafael Local Hazard Mitigation Plan. June 2017.*

[46] *California Department of Forestry and Fire Protection. FHSZ Viewer. Available at: https://egis.fire.ca.gov/FHSZ/. Accessed May 31, 2022.*

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

Environmental Setting

According to the RWQCB's Water Quality Control Plan for the San Francisco Basin, the project site is located in the San Francisco Bay Central Basin and discharges to the Central Bay.[47] The existing CMP culvert is part of an underground section of San Rafael Creek that passes though the Sun Valley neighborhood of San Rafael and under Fifth Avenue. The San Rafael Creek is located within the San Rafael Creek watershed which is 403 acres, consisting of urban/commercial development, hillside woods, and wetlands.

According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Maps (FIRM), the project site is in flood zone X, which is defined as an area within the 500-year flood zone and an area within 100-year flood zone with average depth less than one foot or with drainage areas of less than one square mile.[48]

Regulatory Setting

The City of San Rafael is part of the Marin Countywide Stormwater Pollution Prevention Program (MCSTOPPP) whose goals are to: prevent stormwater pollution, protect and enhance water quality in creeks and wetlands, preserve beneficial uses of local waterways, and comply with State and Federal regulations. MCSTOPPP staff implement permit compliance and track stormwater regulations on behalf of the member agencies.

The federal Clean Water Act (CWA) Section 402, promulgated by rules developed by the US EPA in 1990, establishes the National Pollutant Discharge Elimination System (NPDES) stormwater program. The program requires that urban stormwater runoff pollution of the nation's water be regulated for Municipal Separate Storm Sewer Systems (MS4s). The San Francisco Bay Regional Water Board issued one Municipal Regional Stormwater NPDES Permit (MRP) in 2015 covering MS4s that serve populations of 100,000 or greater. For smaller MS4s, such as the City of San Rafael, discharges are currently regulated under a General Permit renewal issued by the State Water Resources Control Board in 2013 for Storm Water Discharges from Small MS4s (Water Quality Order No. 2013-0001-DWQ, NPDES General Permit No. CAS000004).

Discussion of Impacts

a) ***Less than Significant Impact.*** The project site is part of an underground section of San Rafael Creek. Pollutants of concern during construction would include sediment, trash, petroleum products, sanitary waste, and chemicals. Each of these pollutants on its owns or in combination with other pollutants can have a detrimental effect on water quality. During

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[47] *Regional Water Quality Control Board. Water Quality Control Plan for the San Francisco Bay Basin. Figure 2-5 Central Basin. Available at: https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html. Accessed May 31, 2022.*

[48] *FEMA. National Flood Hazard Lay FIRMette – Map 06041C0456F. Effective March 16, 2016.*

construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, and petroleum products (e.g., fuels) could be spilled or leaked during construction. Any of these pollutants have the potential to be transported via stormwater runoff into San Rafael Creek. As discuss in the Project Description, the project would include measures protect the creek bed. Construction activities in the creek would be restricted to occur within 20 feet from the culvert end wall. The project constructor would implement BMPs (e.g., installation of silt fence) to prevent fine sediment form dropping into the creek. In addition, no re-fueling or maintenance of equipment would be conduct within the creek.

Stormwater and groundwater are anticipated to encountered during construction. The project would involve dewatering of stormwater by passive or pumped diversion. Stormwater from the upstream culvert may be captured via cofferdams or other approved means and diverted around the construction area via gravity pipes or pumped systems. If groundwater is encountered during construction, it would be removed through the use of well pints or other approved means. Groundwater would be collected to Contractor-supplied holding tank(s) prior to discharging to sanitary sewer system under an approved permit from the City of San Rafael. Groundwater discharge from holding tank(s) may be either through gravity or by pressure by maintaining a transfer pump. The discharge would be directed through a particulate/sediment filter and a flow totalizer prior to discharge. All dewatering activities would be conducted consistent with RWQCB requirements and as such, would not result in a violation of water quality standards or waste discharge requirements.

Compliance with the project measures and RQWCB requirements would ensure that the project would result in less than significant impacts to water quality during construction.

Implementation of the project would replace the existing corroded culvert, which would improve the water quality, resulting in a beneficial environmental effect. Long-term operation of the project would not violate any water quality standards or waste discharge requirements. No impact would occur.

b) ***Less than Significant Impact.*** The project site is not located within a California Department of Water Resources recognized Groundwater Basin and does not contain a recognized groundwater aquifer of any size or depth.[49] Implementation of the project would not significantly affect groundwater supplies and groundwater recharge and would not cause a net deficit in aquifer volume or a lowering of the local groundwater level. The project would involve dewatering during construction. Flows would be routed by gravity or pressure around

[49] *California Department of Water Resources. Groundwater Basin Prioritization Tool. Available at: https://gis.water.ca.gov/app/bp-dashboard/final/. Accessed May 31, 2022.*

the project site and discharged to nearby sanitary sewer. Dewatering would be conducted in compliance with permit conditions of the RWQCB water quality certification and CDFW Streambed Alteration Agreement. The impact would be less than significant.

c-i) ***Less than Significant Impact.*** During construction activities, soil would be exposed and disturbed, resulting in an increased potential for soil erosion and siltation compared to existing conditions. As discussed under Impact a) above, implementation of project measures would reduce impacts to water quality during construction, including those impacts associated with soil erosion and siltation. Therefore, adherence to the requirements of the Construction General Permit would ensure that construction of the project would result in a less than significant impact related to erosion or siltation.

c-ii) ***Less than Significant Impact.*** Construction activities would temporarily alter on-site drainage patterns and compact soil, which could increase the volume and velocity of stormwater run-off. However, construction activities would be temporary (approximately 3.5 months), and the increase in runoff would not be substantial. As discussed under Impact a) above, the project would include measures to reduce impacts to water quality. The new RCB culvert would result in a steeper slope storm drain profile which would result in an increase of 67% higher flow capacity. The higher flow capacity would be beneficial during flooding events. Therefore, implementation of project measures would ensure that construction of the project would result in a less than significant impact related to surface runoff and flooding.

c-iii) ***Less than Significant Impact.*** As discussed above, construction activities could alter drainage patterns during construction activities, and spill, leak, or transport construction-related pollutants such as liquid and petroleum products via stormwater runoff into adjacent drainages and downstream receiving waters. The project would include measures (e.g., installation of silt fence and sandbag cofferdam) to reduce stormwater runoff. In addition, the new RCB culvert would increase flow capacity by 67% which would increase the capacity of the stormwater drainage system. Therefore, implementation of project would not result in impacts related to the creation or contribution of runoff that would exceed the capacity of the stormwater drainage system or provide substantial additional sources of polluted runoff would be less than significant.

c-iv) ***Less than Significant Impact.*** As described above, the project site is located in an area within the 500-year flood zone and an area within 100-year flood zone with average depth less than one foot or with drainage areas of less than one square mile. The project would replace the existing CMP culvert with a new RCB culvert at the same location. The new RCB culvert would not impede or redirect flood flows. The impact would be less than significant.

d) ***No Impact.*** As described above, the project is located in an area within the 500-year flood zone and an area within 100-year flood zone (with less than one foot depth or less than one square mile of drainage areas). No large water bodies occur in the project area and flooding

would not inundate the project site. The project is not located within a tsunami inundation area.[50] No impact would occur.

e) ***No Impact.*** The project would not conflict with the RWQCB's Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). No sustainable groundwater management plan applies for the project because the project site is not located within a designated groundwater basin as discuss in Impact b) above. No impact would occur.

[50] *California Emergency Management Agency, California Geological Survey, and University of Southern California. Tsunami Inundation Map for Emergency Planning San Rafael Quadrangle/San Quentin Quadrangle. July 1, 2009.*

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

Environmental Setting

The project site is within Rotary Manor, a private property. The project site is in a residential portion of the City of San Rafael. Existing land uses adjacent to the project site consist of light industrial, commercial, and multi-family residences. The City of San Rafael General Plan 2040, adopted in 2021 with various subsequent chapter amendments, provides policies and implementation strategies for management of the resources and land uses in the City, and the City Codes provide restrictions and requirements to protect resources and comply with local, State, and federal laws. Applicable General Plan policies are listed below. No habitat conservation plans have been adopted for the area.

Regulatory Setting

San Rafael General Plan 2040

Land Use Element

Policy LU-4. Reasonable Interim Use of Property. Allow a landowner reasonable interim use of property in areas where development is presently constrained by factors such as circulation system capacity, infrastructure, and natural hazards such as flooding.

Safety Element

Policy S-1.3. Location of Public Improvements. Avoid locating public improvements and utilities in areas with high hazard levels. When there are no feasible alternatives, require effective mitigation measures to reduce the potential for damage.

Policy S-3.8 Storm Drainage Improvements. Require new development to mitigate potential increases in runoff through a combination of measures, including improvement of local storm drainage facilities. Other measures, such as the use of porous pavement, bioswales, and "green infrastructure" should be encouraged.

Discussion of Impacts

a) ***No Impact.*** The project involves replacement of a CMP culvert with an RCB culvert within the same location. The project location is mainly in the southeast yard of Rotary Manor, a private property located near the Sun Valley neighborhood of San Rafael. The project would not physically divide an established community. No impacts would occur.

b) ***Less-Than-Significant Impact.*** A proposed project would have a significant impact if it were to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The proposed project is subject to several local policies, plans, and regulations, as described above. The primary objective of the proposed project is to replace the corroded CMP culvert with a new RCB culvert to improve stormwater conveyance and reduce flooding in the surrounding areas. The project therefore meets General Plan policies related to safety via storm drainage improvements and flood control. The proposed project would not conflict with the City of San Rafael General Plan 2040 or other applicable land use plans or policies. Impacts would be less than significant.

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

Discussion of Impacts

a, b) ***No Impact.*** The project site is not in or adjacent to any important mineral resource areas. Furthermore, the implementation of the proposed project would not preclude future excavation of oil or minerals should such extraction become viable. As such, there would be no loss of availability of known mineral resources and no impacts to mineral resources.

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

Environmental Setting

Sound is described in terms of loudness and pitch. The standard unit of loudness is the decibel (dB). Since the human ear is not equally sensitive to a given sound level at all pitches, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by accounting for pitch in a manner approximating the sensitivity of the human ear.

Noise levels from a particular source generally decline as distance to the receptor increases. Other factors, such as the weather and reflecting or barriers, also help intensify or reduce the noise level at any given location. Noise from stationary or point sources is reduced by about 6 dBA for every doubling of distance from source to receptor. Noise levels are also generally reduced by 1 dBA for each 1,000 feet of distance due to air absorption. Noise levels may also be reduced by intervening structures – generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The

normal noise attenuation within residential structures with open windows is about 17 dBA, while the noise attenuation with closed windows is about 25 dBA.[51]

The City of San Rafael Noise Ordinance limits construction hours to 7:00 A.M. to 5:00 P.M. Monday through Friday. The Director of Public Works/City Engineer may grant exemptions. Noise in the project site and vicinity is primarily from commercial development, residences, and vehicular traffic along roads. The nearest sensitive noise receptors are residences within the Rotary Manor and in the community around the proposed project site and students attending the Mariposa Bilingual School, located approximately 950 feet southwest of the site.

Discussion of Impacts

a) ***Less than Significant Impact with Mitigation Incorporated.***

Noise is typically defined as unwanted sound. A typical noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to this analysis are as follows:

- L_{eq} – A L_{eq}, or equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- L_{max} – The maximum instantaneous noise level experienced during a given period of time.
- L_{min} – The minimum instantaneous noise level experienced during a given period of time.
- CNEL – The Community Noise Equivalent Level is a 24-hour average Leq with a 5 dBA "weighting" during the hours of 7:00 P.M. to 10:00 P.M. and a 10 dBA "weighting" added to noise during the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these

[51] *National Cooperative Highway Research Program Report 117, Highway Noise: A Design Guide for Highway Engineers, 1971.*

additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24-hour period. For residential uses, environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60–70 dBA range, and high above 70 dBA.[52] Noise levels greater than 85 dBA can cause temporary or permanent hearing loss. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet suburban residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate level noise environments are urban residential or semi-commercial areas (typically 55–60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60–75 dBA) or dense urban or industrial areas (65–80 dBA).

It is widely accepted that in the community noise environment the average healthy ear can barely perceive CNEL noise level changes of 3 dBA. CNEL changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5 dBA CNEL increase is readily noticeable, while the human ear perceives a 10 dBA CNEL increase as a doubling of sound.

Noise levels from a particular source generally decline as distance to the receptor increases. Other factors, such as the weather and reflecting or barriers, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels are also generally reduced by 1 dBA for each 1,000 feet of distance due to air absorption. Noise levels may also be reduced by intervening structures – generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA.

[52] *Office of Planning and Research, State of California General Plan Guidelines, October 2003 (in coordination with the California Department of Health Services).*

The normal noise attenuation within residential structures with open windows is about 17 dBA, while the noise attenuation with closed windows is about 25 dBA.[53]

Table 2 lists the Federal Transit Administrations typical construction equipment noise levels at 50 feet.

Table 2. Construction Equipment Noise Generation

Equipment	Typical Noise Level (dBA) 50 ft from Source	Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	81	Jack Hammer	88
Backhoe	80	Loader	85
Ballast Equalizer	82	Paver	89
Ballast Tamper	83	Pile-driver (Impact)	101
Compactor	82	Pile-driver (Sonic)	96
Concrete Mixer	85	Pneumatic Tool	85
Concrete Pump	82	Pump	76
Concrete Vibrator	76	Roller	74
Crane, Derrick	88	Saw	76
Crane, Mobile	83	Scarifier	83
Dozer	85	Scraper	89
Generator	81	Shovel	82
Grader	85	Spike Driver	77
Impact Wrench	85	Truck	88
Source: Federal Transit Administration. *Transit Noise and Vibration Impact Assessment*, 2006			

Construction activities would generate temporary noise from equipment use; the most common noise generated would be from mobile diesel equipment such as a crane, excavator, loader and compaction equipment. Activities would be restricted to the hours of 7:00 A.M. to 5:00 P.M. Monday through Friday, unless otherwise approved in writing by the

[53] *National Cooperative Highway Research Program Report 117, Highway Noise: A Design Guide for Highway Engineers, 1971.*

Director of Public Works.

Table 2 illustrates typical noise levels from construction equipment at a reference distance of 50 feet. Noise levels from construction equipment attenuate at a rate of six dBA per doubling of distance. Therefore, the noise levels at a distance of 100 feet would be 6 dBA less than those shown in Table 2. Construction equipment would generate maximum noise levels of approximately 101 dB at 50 feet.

Construction noise levels may periodically exceed noise standards in the existing Noise Ordinance, but the temporary noise from construction would not cause a substantial increase in ambient noise or expose sensitive receptors to unacceptable noise levels for long periods of time. Impacts associated with construction noise would cause a potentially significant, temporary increase in noise levels, but incorporation of Mitigation Measure NOISE-1 would reduce noise impacts to a less-than-significant level.

Long-term operational noise impacts would be less than significant because the conditions would be similar to existing noise levels.

Mitigation Measure NOISE–1: The City shall incorporate the following practices into the construction documents to be implemented by the project contractor:

- Construction hours shall be limited to 7:00 A.M. to 5:00 P.M. Monday through Friday, unless otherwise approved in writing by the Director of Public Works.
- Notify businesses, residences, and noise-sensitive land uses adjacent to construction sites of the construction schedule in writing. Designate the City's construction manager as responsible for responding to any local complaints about construction noise. The construction manager shall determine the cause of the noise complaints (for example starting too early, or a bad muffler) and institute reasonable measures to correct the problem. Conspicuously post a telephone number for the construction manager at the construction site.
- Maximize the physical separation between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures:
    - Use heavy-duty mufflers for stationary equipment and barriers around particularly noisy areas of the site or around the entire site;
    - Where feasible, use shields, impervious fences, or other physical sound barriers to inhibit transmission of noise to sensitive receptors;
    - Locate stationary equipment to minimize noise impacts on the community; and
    - Minimize backing movements of equipment.
- Use quiet construction equipment whenever possible.
- Impact equipment (e.g., jack hammers and pavement breakers) shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools. Compressed air exhaust silencers shall be

used on other equipment. Other quieter procedures, such as drilling rather than using impact equipment, shall be used whenever feasible.

- Prohibit unnecessary idling of internal combustion engines.

b) ***Less-Than-Significant Impact.*** Ground-borne vibration and noise is typically associated with blasting operations, the use of pile drivers, and large-scale demolition activities. The proposed project would not require the use of any of the abovementioned methods that would produce excessive ground-borne vibrations and noise. During project operation, the vehicles utilizing the area would not create ground-borne vibrations. As such, no excessive ground-borne vibrations would be generated by the proposed project and these impacts would be less than significant.

c) ***No Impact.*** The nearest public airport to the project site is the Marin County Airport (Gnoss Field), located approximately 14 miles to the north. The project site is also located approximately 3 miles southwest of the private San Rafael airport. This distance precludes the possibility that the project would expose people residing or working in the project area to excessive noise in combination with aviation noise. No impacts in this regard would occur.

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

Environmental Setting

The project site is in a Multifamily Residential Zoning District of the City, and is surrounded by commercial, light industry, and residential land uses. The existing CMP culvert is part of an underground section of San Rafael Creek that passes though the Sun Valley neighborhood of San Rafael and under Fifth Avenue.

Discussion of Impacts

a, b) ***No Impact.*** The project would replace an existing CMP culvert with a new RCB culvert in the current location. The project would be constructed within Rotary Manor, a private property, and would not require displacement of people or housing. As the project does not include new housing, it would not result in a substantial increase in population or housing units in the City. No impacts would occur.

XV. PUBLIC SERVICES — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) 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:				
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Environmental Setting

San Rafael Fire Department

The San Rafael Fire Department provides life safety emergency and non-emergency services in the areas of fire protection, technical rescue, emergency medical services, and disaster response. The Department operates 7 Fire Stations with 90 personnel that provide 24/7 services within the City limits and other areas as defined through contracts and mutual aid agreements with bordering areas. San Rafael Fire Station 52 is the closest station to the project site, located 1.2 miles east of the project site.

San Rafael Police Department

The project site is served by the San Rafael Police Department (SRPD). The SRPD has been in existence since 1855. The SRPD operates out of the main station located at 1400 Fifth Avenue and provides police protection throughout the City. The SRPD has not established a specific response time or staffing ratio standard. However, the SRPD headquarters are located approximately 0.5 mile east of the proposed project site.

San Rafael City Schools

The San Rafael City Schools (SRCS) includes the San Rafael Elementary School District and the San Rafael High School District, with a total student population of nearly 7,000. The two districts are governed by one school board and one district office administration. The Elementary District is

composed of nine schools. The High School District provides secondary education to students residing in two elementary districts: Dixie School District and San Rafael Elementary District. The High School District has two comprehensive 9-12 high schools (San Rafael High and Terra Linda High) and a continuation high school (Madrone High).

Parks and Recreational Facilities

The City of San Rafael has 25 City-owned parks totaling 140 acres, eight County parks totaling 532 acres, one State park with 1,640 acres and three community centers. There are 3,285 acres of open space within the city limits of San Rafael, or approximately 25% of the City's land area, which is owned or in part by the City of San Rafael. There is almost 7,300 acres of combined City and County open space within San Rafael's Sphere of Influence.

Discussion of Impacts

a, b) ***Less Than Significant Impact.*** The purpose of the proposed project is to replace a corroded CMP culvert with a new RCB culvert in order to improve conveyance and flood control in the surrounding commercial and residential areas. There is some potential for construction activities to slow emergency response times in a temporary and minor way; however, this is very unlikely given the proposed project's location in an area away from major roads or emergency routes. No roads would be closed during the construction phase of the project. Impacts to fire and police protection services would therefore be less than significant.

c-e) ***No Impact.*** Given the proposed project would not permanently increase the existing residential or employment population in the City, the proposed project would not result in a long-term increase in the demand for public services such as schools, parks, or other public facilities or require construction of new facilities. No impacts would occur.

XVI. **RECREATION** — Would the project:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
a) 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) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental Setting

No parks or recreational facilities are located in the project site. The nearest public recreation facility is Boyd Memorial Park, located approximately 2,700 feet east of the project site.

Discussion of Impacts

a, b) ***No Impact.*** Given the proposed project would not permanently increase the existing residential or employment population in the City, the project would not increase the use of nearby recreational facilities. The purpose of the project is to replace the corroded culvert to improve stormwater conveyance and flood control in the surrounding commercial and residential areas and it does not include recreational facilities or require the construction or expansion of recreational facilities. No impacts would occur.

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

Environmental Setting

The project site is located off of Fifth Avenue in a residential area within the Sun Valley neighborhood in the City of San Rafael. The current corroded CMP culvert is located in the southeast yard of Rotary Manor. The San Rafael General Plan 2040 Circulation Element calls out San Rafael's circulation needs in the following categories: roadway improvements, school transportation, transit users, transit services, paratransit services, bicycle and pedestrian facilities, parking facilities, airport facilities, and funding needs. It also identifies the City's main highways and arterials. Highway 101, one mile east of the project site, is the closest highway. Francisco Boulevard West (approximately one mile southeast) is the closest major arterial road to the project site. Second Street and Fourth Street are two minor arterial roads which create access to the residential, commercial, and light industrial areas of the project vicinity.

Discussion of Impacts

a) ***Less Than Significant Impact.*** The project consists of replacement of the existing CMP culvert with a new RCB culvert. Following construction, the project would have negligible impacts on the area's transportation system. The new culvert would continue to operate as it currently does. The project does not include development of housing or businesses that would generate new traffic. A small increase in traffic would occur in the project area during construction from construction vehicles and construction workers accessing the project site. However, the impacts would be short-term, occurring only during the construction period (approximately 3.5 months). The project would maintain all lanes of traffic on all main roads at all times during construction. Impacts would be less than significant.

b) ***Less Than Significant Impact.*** A significant impact may occur if the proposed project were to be inconsistent with provisions outlined in CEQA Guidelines section 15064.3, subdivision (b), which sets forth criteria for analyzing transportation impacts. Under the CEQA Guidelines, a lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including a qualitative analysis.

The proposed project would have no impacts on vehicle miles traveled in and around the project site on an operational level. The new RCB culvert would require very little maintenance once it is operational, and that which it would require would be consistent with current baseline conditions.

Construction traffic (equipment and materials transport and daily worker traffic) would slightly increase traffic on local roads during the temporary construction phase of the proposed project. Temporary construction traffic would be limited to equipment delivery and material transport, and a few employee vehicles trips on a daily basis, which would be parked on-site. The temporary construction-related traffic would not result in a noticeable increase in traffic on local roads. Vehicles transporting equipment and materials to the project site could cause slight delays for travelers as the construction vehicles slow to turn onto the access road from Fifth Avenue, but no temporary lane closures or detours would be required. At least one week prior to the commencement of work, the Contractor would provide project information signs to notify drivers of upcoming project and potential traffic delays. Given the temporary nature of construction-related traffic, impacts on traffic would be less than significant.

c) ***No Impact.*** A significant impact may occur if a project were to include a new roadway design, introduce a new land use or permanent project features into an area with specific transportation requirements and characteristics that have not been previously experienced in that area, or if project access or other features were designed in such a way as to create hazardous conditions. The proposed project does not require features or structures that are not already characteristic of the baseline condition. The project site contains a corroded CMP culvert which would be replaced with the new RCB culvert in the same location, off of main road. No changes to the character of the area would be created. The proposed work would not bring new traffic or travel to the area or introduce design features that are not already present, and the proposed uses are the same as those that are already in place and are therefore compatible. No impacts would occur in this area.

d) ***Less than Significant Impact.*** The project would not lead to any long-term changes in emergency access. The project would replace a corroded CMP culvert with a new RCB culvert within a privately-owned parcel and would not impede any roadways or public rights of way important for emergency access. All lanes would remain open on all roads and no detours would be required. There would be increased vehicular demand along Fifth Avenue and Highway 101 for construction and system maintenance. Given the small scope of the

project and the potential for increased roadway demand, this would not be sufficient to result in inadequate emergency access. As the project would not alter roadways or lead to substantially increased traffic as to impede emergency access, the project would not result in inadequate emergency access, and a less-than-significant impact would occur.

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

Environmental Setting

As discussed in Section V, Cultural Resources, the NAHC was contacted on January 14, 2022, to request a review of the Sacred Lands file and to request a list of Native American contacts in this area. The response letter dated January 21, 2020, by Andrew Green (NAHC Staff Services Analyst) indicated that the search of the Sacred Lands File had a negative result. The NAHC also forwarded a list of tribal entities to contact for their input or concerns regarding the project.

On January 21, 2021, a letter was sent via email or regular mail to all parties listed by the NAHC to inform them about the project, to solicit any concerns.

Buffy McQuillen, Tribal Historic Preservation Officer (THPO) of Federal Indians of Graton Rancheria (FIGR), responded on February 4, 2020, and requested to engage in consultation for the project. On June 17, 2022, tribal cultural monitor Robin Meely (FIGR) participated in the field survey of the APE. On July 20, 2022, the City of San Rafael emailed Buffy McQuillen from FIGR to initiate formal tribal consultation and provided the Archaeological Survey Report to the tribe for review. On August 17, 2022, The City sent a follow-up email to Ms. McQuillen regarding the formal tribal consultation request. On August 31, 2022, Ms. McQuillen responded to the City's email and confirmed the receipt

of the Archaeological Survey Report. Appendix B provides documentation of Native American correspondences.

Regulatory Setting

Assembly Bill 52

In September 2014, the California Legislature passed Assembly Bill ("AB") 52, which added provisions to the Public Resources Code ("PRC") concerning the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American tribes. In particular, AB 52 now requires lead agencies to analyze a project's impacts on "tribal cultural resources," separately from archaeological resources (PRC Section 21074; 21083.09). Under AB 52, "tribal cultural resources" include "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" that are either (1) listed, or determined to be eligible for listing, on the state or local register of historic resources; or (2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource (PRC Section 21074).

AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Sections 21080.3.1, 21080.3.2, 21082.3). If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document must discuss (1) whether the proposed project has a significant impact on an identified tribal cultural resource and (2) whether feasible alternatives or mitigation measures avoid or substantially less the impact on the identified tribal cultural resource (PRC Section 21082.3(b)). Finally, AB 52 required the Office of Planning and Research to update Appendix G of the CEQA Guidelines by July 1, 2016 to provide sample questions regarding impacts to tribal cultural resources (PRC Section 21083.09). AB 52's provisions apply to projects that have a notice of preparation filed on or after July 1, 2015.

California Register of Historical Resources

Criteria for important historical resources on the California Register or historic properties on the National Register are as follows:

1 Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California.
2 Is associated with the lives of persons important to local, California history.
3 Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of a master or possess high artistic values.
4 Has yielded, or may be likely to yield, information important to the pre-history or history of the local area or California.

Discussion of Impacts

a-i, ii) ***Less than Significant with Mitigation Incorporated.*** No CRHR-eligible or listed resources are located within the project site, as discussed under Section V, Cultural Resources. Tribal notification letters were sent on January 21, 2021, to representatives of Native American tribes with traditional or cultural affiliation to the project area, including Merlene Sanchez of Guidiville Band of Pomo Indians and Buffy McQuillen of FIGR. Buffy McQuillen of FIGR responded on February 4, 2022 and requested to engage in consultation of the project. On June 17, 2022, tribal cultural monitor Robin Meely of FIGR participated in the field survey of the APE. On July 20, 2022, the City of San Rafael emailed Buffy McQuillen from FIGR to initiate formal tribal consultation and provided the Archaeological Survey Report to the tribe for review. On August 17, 2022, the City sent a follow up email and Ms. McQuillen responded to the email and confirmed the receipt of the Archaeological Survey Report on August 31, 2022. No other tribal responses have been received at the time of preparing this IS/MND.

As discussed under Section V, Cultural Resources, no cultural resources were identified within the APE as a result of the records search, literature review, Native American consultation, or archaeological field survey. The project would not impact a known listed or eligible tribal cultural resource. Previously undiscovered cultural resources could be discovered and considered as tribal cultural resources during ground disturbing activities. The impact would be potentially significant. However, implementation of Mitigation Measures CUL-1 and CUL-2 in Section V would ensure that impacts to tribal cultural resources remain less than significant.

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

Environmental Setting

The project site is within the Sun Valley neighborhood in San Rafael, which is served by the San Rafael Sanitation District which provides sanitary sewer service to the Central San Rafael area. The San Rafael Sanitation District maintains 32 pump stations, 13 miles of force main, and clean 132 miles of sewer pipelines. After collection, the wastewater is transported for treatment to the Central Marin Sanitation Agency.

Discussion of Impacts

a) ***Less than Significant Impact.*** The proposed project would replace the existing corroded CMP culvert with a new RCB culvert. The project would not require or result in the

construction of new water supply facilities or expansion of such facilities. During construction, water would be required primarily for dust suppression and would be obtained from a local source and trucked to the project site. Water use would cease when construction is complete. Electric power for construction activities would be provided by generators. The culvert replacement would not alter the existing drainage pattern of the area. During construction, portable toilets would be transported to the project site for use by construction workers. The portable toilet waste generated during the construction period would be trucked to an appropriate wastewater treatment facility. The wastewater treatment facility would be able to accommodate this small quantity of waste and would not need to be expanded.

b) ***Less than Significant Impact.*** The project would not result in an increase in the amount of water that is currently distributed to the project site. New or expanded water supply entitlements would not be required to serve the project. The project would require potable or reclaimed water for dust suppression during construction. However, the amount of water required would be relatively small and would only be needed during the construction period. Once complete, no water would be required for the project operation. Therefore, the impacts related to water supplies would be less than significant.

c) ***Less than Significant Impact.*** Refer to Impact a) above for a discussion of the need for portable toilets during construction. Once operational, the project would not generate wastewater. Impacts would be less than significant.

d, e) ***Less than Significant Impact.*** Grading activities during construction of the project could result in disposal of approximately 180 CY of cut soil. The waste generated from construction activities would be off-hauled and properly disposed of at landfills in the area. The closest landfills to the project site are Redwood Landfill (approximately 16 miles to the north) and Potrero Hills Landfill (approximately 50 miles to the northeast). The Redwood Landfill is permitted to accept 2,300 tons of material daily and is expected to close in 2024.[54] The Potrero Hills Landfill is permitted to accept 4, 330 tons of material daily and is expected to close in 2048.[55] Demolition activities would generate asbestos-cement drain pipe which would be disposal of at an asbestos containing waste disposal site. Altamont Landfill is located within the City of Livermore and is permitted to accept asbestos construction

[54] *CalRecycle. SWIS Facility/Site Activity Details – Redwood Landfill (21-AA-0001). Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/3054?siteID=1727. Accessed June 3, 2022.*

[55] *CalRecycle. SWIS Facility/Site Activity Details – Potrero Hills Landfill (48-AA-0075). Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/1194?siteID=3591. Accessed June 3, 2022.*

waste.[56] The Altamont Landfill is currently permitted to accept 2,000 tons of material per day.[57] Adequate capacity is available to accommodate the disposal of materials associated with the project. The impact on landfills would be less than significant.

[56] *CalRecycle. SWIS Facility/Site Activity Details – Altamont Landfill & Resource Recovery (01-AA-0009). Available at: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/8?siteID=7. Accessed June 3, 2022.*

[57] *Ibid.*

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

Environmental Setting

The San Rafael Wildfire Prevention and Protection Action Plan outlines measures to reduce wildfire risk throughout the City. The project site is located within Rotary Manor, a private property, which is within the Sun Valley neighborhood in San Rafael. The area is a Multifamily Residential Zoning District, with very little slope. The project site is located within a Wildland Urban Interface and adjacent to Fifth Avenue which is a primary evacuation route. [58] The project site is located within a Local Responsibility Area and is not located within an area classified as moderate, high, or very fire severity zone by California Department of Forestry and Fire Prevention (Cal Fire).[59]classified by

[58] *Urban Wildland Interface & Evacuation Routes. Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=688f506cfb144067826bb35a062b0f0a. Accessed June 15, 2022.*

[59] *California Department of Forestry and Fire Protection. FHSZ Viewer. Available at: https://egis.fire.ca.gov/FHSZ/. Accessed May 31, 2022.*

Discussion of Impacts

a-d) ***Less than Significant Impact.*** The project site is located next to Fifth Avenue which is a primary evacuation route. A full closure of roadway would be expected during construction work hours. However, the project contractor would be required to implement traffic control measures conforming to the CAMUTCD and the City's standard specifications. The project would not require full closure of Fifth Avenue. Warning signs regarding work zones would also be placed prior to construction. The impact to evacuation routes would be less than significant. The project site is not located within an area classified by Cal Fire as moderate, high, or very high fire severity zone, and there are no large, undeveloped areas on or near the site that would exacerbate fire risks such that would expose the project to wildfire related hazards. The project would not require installation or maintenance of associated infrastructure that may exacerbate fire risk. The project would include replacement of an existing culvert to repair a deteriorated storm drain. The new RCB culvert would result in an increase of flow capacity which would reduce flood risk in the area. Implementation of the project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. The impact related to wildfire would be less than significant.

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

Discussion of Impacts

a) ***Less than Significant with Mitigation Incorporation.*** The incorporation of the mitigation measures included in Section IV (Biological Resources) would reduce potential impacts to a less-than-significant level. The project site does not contain any resource listed in, or determined to be eligible by, the State Historical Resource Commission and does not contain a resource included in a local register of historic resources or identified as significant in a historical resource survey. Additionally, the project site does not contain any object, building, structure, site, area, place, record, or manuscript that a lead agency determined to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. However, cultural resources could potentially be uncovered during construction. Mitigation measures included in Section V (Cultural Resources) would reduce potential impacts to a less-than-significant level.

b) ***Less Than Significant with Mitigation Incorporation.*** Cumulatively considerable means that the incremental effects of an individual 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. The analysis within this Initial Study demonstrates that the project would not have any individually limited, but cumulatively considerable impacts. As presented in the analysis in Biological Resources, Cultural Resources, Noise, and Tribal Cultural Resources sections, any potentially significant impacts would be less than significant after mitigation. Due to the limited scope of direct physical impacts to the environment associated with construction, the project's impacts are project-specific in nature. Compliance with the conditions of approval issued for the proposed development would further assure that project-level impacts would not be cumulatively considerable. Consequently, the project along with other cumulative projects would create a less than significant cumulative impact with respect to all environmental issues.

c) ***Less Than Significant Impact.*** With implementation of the project measures discussed in the Project Description, the project would not result in substantial adverse effects to human beings, either directly or indirectly.

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REPORT PREPARATION

City of San Rafael – CEQA Lead Agency

Theo Sanchez, P.E., Associate Civil Engineer

Coastland Civil Engineering, Inc. – Project Engineer

Jenny Melman., Senior Engineer

WRA, Inc. – CEQA and Regulatory Permits Consultant

Greta Brownlow, Principal
Geoff Reilly, Project Manager
Yingying Cai, Environmental Planner
Matt Osowski, Environmental Permitting Specialist
Ivy Poisson, Biologist
Tommy Dryer, Biologist
Peter Kobylarz, GIS Professional

ALTA Archaeological Consultants – CEQA Cultural Resources Subconsultant
Risa DeGeorgey, Principal
Nicholas Radtkey, Senor Archaeologist/Architectural Historian

Appendix A: Archaeological Survey Report (Confidential)

This document contains sensitive information.
Public can contact the City of San Rafael to request review of the document.

Appendix B: Native American Correspondence

Local Government Tribal Consultation List Request

NATIVE AMERIAN HERITAGE COMMISSION

915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Date: 01/14/2020

Type of List Requested

■ **CEQA Tribal Consultation List (AB 52) –** ***Per Public Resource Code §21080.3, subs. (b), (d), (e) and 21080.3.2***

☐ **General Plan (SB 18)** – ***Per Government Code §65352.3.***

Local Action Type:

☐General Plan ☐General Plan Element ☐General Plan Amendment
☐Specific Plan ☐Specific Plan Amendment ☐Pre-planning Outreach

Required Information

Project Title: ALTA2020-03 Rotary Manor Culvert Project
Local Government/Lead Agency: US Army Corps of Engineers
Contact Person: Dean Martorana (Alta Archaeological Consulting)
Street Address: 15 Third Street
City: Santa Rosa Zip: 95404
Phone: (707) 544-4206 Fax: (707) 546-2135
Email: dean@altaac.com

Specific Area Subject to Proposed Action

County: Marin **City/Community:** San Rafael

Project Description: The project proponent is applying for a Federal 404 permit to replace a large corrugated metal pipe culvert which has failed and needs either repair or complete replacement. The property is located on one parcel (APN 010-291-71) totaling 4.52 acres. The physical address of the parcel is 1821 Fifth Avenue near San Rafael, California (Map 1).

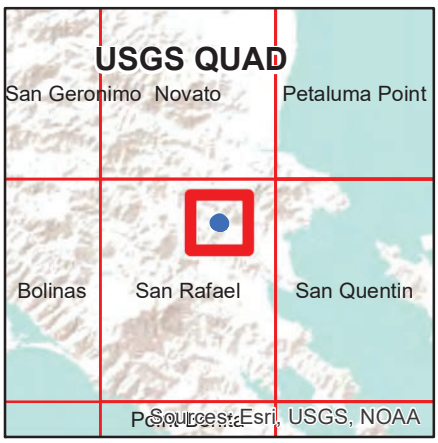
Additional Request

■ **Sacred Lands File Search –** ***Required Information***

USGS 7.5' Quadrangle Name(s): San Rafael
Township: NA Range: NA

Section(s): Unsectioned portion of Rancho San Pedro, Santa Margarita y Las Gallinas, Mount Diablo Base and Meridian

Figure 2. Project Location



USGS 7.5' San Rafael Quad.
(2013 National Geographic Society)
San Pedro Santa Margarita
y Las Gallinas Land Grant; MDBM

1821 Fifth Avenue
San Rafael, CA 94901
(APN 010-291-71)

1:24,000
Miles
0 0.25 0.5 1
0 0.25 0.5 1
Kilometers

ALTA
ARCHAEOLOGICAL CONSULTING
ALTA 2020-03
Map Date: 1/9/2020

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

January 21, 2020

Dean Martorana
US Army Corps of Engineers

Via Email to: dean@altaac.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, ALTA2020-03 Rotary Manor Culvert Project, Marin County

Dear Mr. Martorana:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

- Any report that may contain site forms, site significance, and suggested mitigation measures.

  All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Staff Services Analyst

Attachment

Native American Heritage Commission
Native American Contacts List
January 21, 2020

Federated Indians of Graton Rancheria
Gene Buvelot
6400 Redwood Drive, Ste 300 Coast Miwok
Rohnert Park ,CA 94928 Southern Pomo
gbuvelot@gratonrancheria.com
(415) 279-4844 Cell
(707) 566-2288 ext 103

Federated Indians of Graton Rancheria
Greg Sarris, Chairperson
6400 Redwood Drive, Ste 300 Coast Miwok
Rohnert Park ,CA 94928 Southern Pomo
gbuvelot@gratonrancheria.com
(707) 566-2288 Office
(707) 566-2291 Fax

Guidiville Indian Rancheria
Merlene Sanchez, Chairperson
P.O. Box 339 Pomo
Talmage ,CA 95481
admin@guidiville.net
(707) 462-3682
(707) 462-9183 Fax

This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.

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, or Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans Tribes for the proposed:
ALTA2020-03 Rotary Manor Culvert Project, Marin County.

Alta Archaeological Consulting, LLC
15 Third Street
Santa Rosa, CA 95401
office (707) 544-4206
fax (707) 546-2135
www.altaac.com

January 21, 2020

Merlene Sanchez, Chairperson
Guidiville Band of Pomo Indians
P.O. Box 339
Talmage, CA 95481

Re: ALTA2020-03 – WRA Rotary Manor Culvert San Rafael

Dear Chairperson Sanchez,

Alta Archaeological Consulting (ALTA) has been retained by the project proponent to complete an archaeological field survey for a City of San Rafael project. This project requires a Section 404 permit from the Army Corps of Engineers, who is serving as the Federal lead agency for this project.

Rotary Manor, located on private property in the City's Sun Valley neighborhood, includes a corrugated metal pipe culvert that has failed requiring rehabilitation or full removal and replacement. The property is located on one parcel (APN 010-291-71) totaling 4.52 acres. The physical address is 1821 Fifth Avenue, San Rafael, CA 94901. The project is located on Township 2N, Range 6W, Section 32, of the Mount Diablo Base and Meridian.

We are contacting you to provide notification of this project pursuant Section 5 of Public Resources Code 21080.3.1(d). The regulations require that you contact us within 30 days from your receipt of this letter to request a consultation regarding any potential impacts of this project on tribal cultural resources. If you do not contact us within 30 days following receipt of this letter, the County will proceed with the project with the assumption that the project will not have a potential effect on tribal cultural resources (an archaeological survey of the parcels will be conducted in support of the permit process). If consultation is requested, please provide the name and contact information of the designated lead contact person as part of your request. The County will contact the designated person to set a meeting date to begin consultation within 30 days of our receipt of your request. Thank you in advance for your efforts.

Sincerely,

Dean Martorana, M.A., RPA
Staff Archaeologist
15 Third Street
Santa Rosa, CA 95401
dean@altaac.com
(707) 544-4206 office
(707) 546-2135 fax

Alta Archaeological Consulting, LLC
15 Third Street
Santa Rosa, CA 95401
office (707) 544-4206
fax (707) 546-2135
www.altaac.com

January 21, 2020

Buffy McQuillen, Tribal Heritage Preservation Officer
Federated Indians of Graton Rancheria
6400 Redwood Drive, Ste 300
Rohnert Park, CA 94928

Re: ALTA2020-03 – WRA Rotary Manor Culvert San Rafael

Dear Tribal Heritage Preservation Officer McQuillen,

Alta Archaeological Consulting (ALTA) has been retained by the project proponent to complete an archaeological field survey for a City of San Rafael project. This project requires a Section 404 permit from the Army Corps of Engineers, who is serving as the Federal lead agency for this project.

Rotary Manor, located on private property in the City's Sun Valley neighborhood, includes a corrugated metal pipe culvert that has failed requiring rehabilitation or full removal and replacement. The property is located on one parcel (APN 010-291-71) totaling 4.52 acres. The physical address is 1821 Fifth Avenue, San Rafael, CA 94901. The project is located on Township 2N, Range 6W, Section 32, of the Mount Diablo Base and Meridian.

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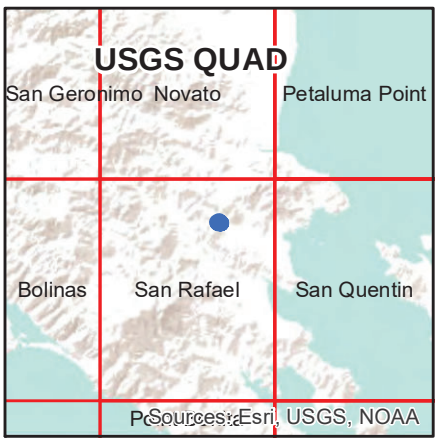
Sincerely,

Dean Martorana, M.A., RPA
Staff Archaeologist
15 Third Street
Santa Rosa, CA 95401
dean@altaac.com
(707) 544-4206 office
(707) 546-2135 fax



USGS 7.5' San Rafael Quad.
(2013 National Geographic Society)
San Pedro Santa Margarita
y Las Gallinas Land Grant; MDBM

Project Parcel

1821 Fifth Avenue
San Rafael, CA 94901
(APN 010-291-71)

1:24,000
Miles
0 0.25 0.5 1
0 0.25 0.5 1
Kilometers

ALTA ARCHAEOLOGICAL CONSULTING
ALTA 2020-03
Map Date: 1/21/2020

FEDERATED INDIANS OF
GRATON
RANCHERIA

Submitted via electronic e-mail: dean@altaac.com

February 4, 2020

RE: Formal Request for Tribal Consultation Pursuant to the California Environmental Quality Act (CEQA), Public Resources Code section 21080.3.1, subds. (b), (d) and (e) for the ALTA2020-03 - *WRA Rotary Manor Culvert Project, 1821 Fifth Avenue, San Rafael.*

Dear Agency Representative:

This letter constitutes a formal request for tribal consultation under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e) for the mitigation of potential project impacts to tribal cultural resource for a project within the Federated Indians of Graton Rancheria's ancestral lands:

Receiving this letter sets forth the Tribe's formal request for consultation on the following topics checked below, which shall be included in consultation if requested (Public Resources Code section 21080.3.2, subd. (a):

___x__ Alternatives to the project
___x__ Recommended mitigation measures
___x__ Significant effects of the project

The Tribe also requests consultation on the following discretionary topics checked below (Public Resources Code section 21080.3.2, subd. (a):

___x__ Type of environmental review necessary
___x__ Significance of tribal cultural resources, including any regulations, policies or standards used by your agency to determine significance of tribal cultural resources
___x__ Significance of the project's impacts on tribal cultural resources
___x__ Project alternatives and/or appropriate measures for preservation or mitigation that we may recommend, including, but not limited to:

(1) Avoidance and preservation of the resources in place, pursuant to Public Resources Code section 21084.3, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks or other open space, to incorporate the resources with culturally appropriate protection and management criteria;
(2) Treating the resources with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resources, including but not limited to the following:
    a. Protecting the cultural character and integrity of the resource;
    b. Protection the traditional use of the resource; and

c. Protecting the confidentiality of the resource.

(3) Permanent conservation easements or other interests in real property, with culturally Appropriate management criteria for the purposes of preserving or utilizing the resources or places.

(4) Protecting the resource.

Additionally, the Tribe would like to receive any cultural resources assessments or other assessments that have been completed on all or part of the project's potential "area of project effect" (APE), including, but not limited to:

1).The results of any record search(es) conducted at an archaeological information center of the California Historical Resources Information System (CHRIS), including, but not limited to:

(a) Any known cultural resources that have already been recorded on or adjacent to the potential APE;
(b) Whether the probability is low, moderate or high that cultural resources are located in the potential APE; and
(c) If a survey is required to determine whether previously unrecorded cultural resources are present in the potential APE.

2). The results of any archaeological inventory survey that was conducted of all or part of the potential APE, including, but not limited to:

(a) Any report that may contain site forms, site significance, and suggested mitigation measures.

3). The results of any Sacred Lands File searches conducted through the Native American Heritage Commission for all or part of the potential APE;

4). Any ethnographic studies conducted for any area including all or part of the potential APE; and

5) Any geotechnical reports regarding all or part of the potential APE.

We would like to remind your agency that CEQA Guidelines section 15126.4, subdivision (b)(3) states that preservation in place is the preferred manner of mitigating impacts to archaeological sites. Section 15126.4, subd. (b)(3) of the CEQA Guidelines has been interpreted by the California Court of Appeal to mean that "feasible preservation in place must be adopted to mitigate impacts to historical resources of an archaeological nature unless the lead agency determines that another form of mitigation is available and provides superior mitigation of impacts." *Madera Oversight Coalition v. County of Madera* (2011) 199 Cal.App.4th 48, disapproved on other grounds, *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439.

FEDERATED INDIANS OF
GRATON
RANCHERIA

The Tribe would like to begin consultation within 30 days of your receipt of this letter. Please contact my office at (707) 566-2288 or by email at bmcquillen@gratonrancheria.com as the person who will serve as the lead contact on behalf of the Tribe.

Sincerely,

Buffy McQuillen, THPO/NAGPRA
Federated Indians of Graton Rancheria

6400 Redwood Drive, Suite 300 • Rohnert Park, CA • 94928 • Office: 707.566.2288 • Fax: 707.566.2291
www.gratonrancheria.com

Yingying Cai <yingying.cai@wra-ca.com>

Rotary Manor Tribal Consultation

Theo Sanchez <Theo.Sanchez@cityofsanrafael.org> Wed, Jul 20, 2022 at 9:57 AM
To: "bmcquillen@gratonrancheria.com" <bmcquillen@gratonrancheria.com>
Cc: Geoff Reilly <reilly@wra-ca.com>, Jennifer Melman <melman@coastlandcivil.com>, Heidi Utterback <utterback@coastlandcivil.com>, Yingying Cai <yingying.cai@wra-ca.com>

Good morning Buffy,

We would like to initial formal consultation with the Federated Indians of Graton Rancheria for the City of San Rafael's Rotary Manor Culvert Replacement project. In preparation of the CEQA Mitigated Negative Declaration for this project, our consultant has prepared the attached cultural report for the project. Please review this document and let us know if you have any comments.

Thank you,

Theo Sanchez, PE | City of San Rafael

Associate Civil Engineer

Department of Public Works

Work Cell# 415.725.1003

Theo.Sanchez@cityofsanrafael.org

From: Yingying Cai <yingying.cai@wra-ca.com>
Sent: Thursday, July 7, 2022 2:11 PM
To: Theo Sanchez <theo.sanchez@cityofsanrafael.org>
Cc: Geoff Reilly <reilly@wra-ca.com>; Jennifer Melman <melman@coastlandcivil.com>; Heidi Utterback <utterback@coastlandcivil.com>

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ALTA2020_03 Rotary Manor Culvert 7_5_22.pdf
4634K

Yingying Cai <yingying.cai@wra-ca.com>

Rotary Manor Tribal Consultation

Theo Sanchez <Theo.Sanchez@cityofsanrafael.org> Wed, Aug 17, 2022 at 9:27 AM
To: "bmcquillen@gratonrancheria.com" <bmcquillen@gratonrancheria.com>
Cc: Geoff Reilly <reilly@wra-ca.com>, Jennifer Melman <melman@coastlandcivil.com>, Heidi Utterback <utterback@coastlandcivil.com>, Yingying Cai <yingying.cai@wra-ca.com>

Good morning,

Just wanted to follow up regarding the request below for formal consultation on the City's Rotary Manor Culvert Replacement project. Attached is the cultural report that was prepared for this project. Please let us know if you have any comments.

Thank you,

Theo Sanchez, PE | City of San Rafael

Associate Civil Engineer

Department of Public Works

Work Cell# 415.725.1003

Theo.Sanchez@cityofsanrafael.org

From: Theo Sanchez
Sent: Wednesday, July 20, 2022 9:57 AM
To: bmcquillen@gratonrancheria.com
Cc: Geoff Reilly <reilly@wra-ca.com>; Jennifer Melman <melman@coastlandcivil.com>; Heidi Utterback <utterback@coastlandcivil.com>; Yingying Cai <yingying.cai@wra-ca.com>
Subject: RE: Rotary Manor Tribal Consultation

Good morning Buffy,

[Quoted text hidden]

ALTA2020_03 Rotary Manor Culvert 7_5_22.pdf
4634K

Yingying Cai <yingying.cai@wra-ca.com>

Rotary Manor Tribal Consultation

Buffy McQuillen <BMcQuillen@gratonrancheria.com> Wed, Aug 31, 2022 at 1:30 PM
To: Theo Sanchez <Theo.Sanchez@cityofsanrafael.org>
Cc: Geoff Reilly <reilly@wra-ca.com>, Jennifer Melman <melman@coastlandcivil.com>, Heidi Utterback <utterback@coastlandcivil.com>, Yingying Cai <yingying.cai@wra-ca.com>, Hector Garcia <HGarcia@gratonrancheria.com>

Hi Theo, thank you for the information.

Buffy

Buffy McQuillen

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Appendix C: Geotechnical Investigation Report

MILLER PACIFIC ENGINEERING GROUP

April 12, 2021
File: 1725.080altr.doc

Coastland
1400 Neotomas Avenue
Santa Rosa, California 95405

Attn: Jennifer Melman

Re: Geotechnical Investigation
Rotary Manor Culvert Replacement
San Rafael, California

Introduction and Project Description

This letter presents the results of our Geotechnical Investigation for the proposed culvert replacement at the Rotary Manor at 1821 Fifth Avenue in San Rafael. The San Rafael Creek traverses the eastern portion of the property and a culvert was installed during previous site development to convey flows through the site. While detailed information pertaining to the original culvert construction is not available, the structure appears to have been constructed using concrete box and arched corrugated metal pipe (CMP) sections.

Miller Pacific was retained by the City in 2016 to evaluate conceptual repair alternatives for a sinkhole that developed near the south end of the culvert after a portion of the CMP segment failed. The City has since elected to replace the CMP portion of the culvert with a new six-foot-wide by eight-foot-tall cast-in-place concrete box culvert which will be designed by Coastland. The new culvert is expected to be installed using open trench methods with excavations of up to about 15 feet required for construction. An existing wood trellis located near the failed portion of the culvert will also be reconstructed as part of the planned improvements. A Site Plan showing the existing conditions and proposed improvements is attached as Figure 1.

The purpose of our Geotechnical Investigation is to evaluate site conditions and provide geotechnical recommendations for design and construction of the project. The scope of our Investigation is outlined in our proposal letter dated September 22, 2021 and includes reviewing readily-available geologic information, a site reconnaissance to observe and document existing conditions, exploring subsurface conditions with two borings, geotechnical laboratory testing of select soil samples, environmental laboratory testing to screen the existing soils for the presence of CAM 17 metals and total petroleum hydrocarbons, and preparation of this letter report which summarizes our subsurface exploration and laboratory testing and provides geotechnical recommendations and design criteria for the planned improvements.

Regional Geology and Seismicity

The project site is located along San Rafael Creek near the southeast end of Sun Valley. Regional geologic mapping by the California Division of Mines and Geology[1] shows the project area is

[1] California Division of Mines and Geology, "Geology of the Eastern Part of the San Rafael Area, Marin County, California (Open File Report 76-2, Plate 1C), 1976.

underlain by Quaternary-age alluvial deposits. The site is situated near the northern base of Grove Hill and the areas just south of the site are mapped as Jurassic- to Cretaceous-age Franciscan mélange bedrock with greenstone rock masses mapped within the mélange unit. A Regional Geologic Map and descriptions of the mapped geologic units are shown on Figure 2.

The California Geological Survey (previously known as the California Division of Mines and Geology), defines a "Holocene-active fault" as one that had surface displacement within Holocene time (the last 11,700 years). CGS has mapped various faults in the region as part of their Fault Activity Map of California (CGS, 2010). Many of these faults are shown in relation to the project site on the attached Active Fault Map, Figure 3. The San Andreas, San Gregorio and Hayward Faults are the nearest known active faults. The San Andreas and San Gregorio Faults are located approximately 13.6 kilometers (8.5 miles) and 14.9 kilometers (9.3 miles) southwest of the site, respectively, while the Hayward Fault is located approximately 14.6 kilometers (9.0 miles) to the northeast.

Surface Conditions

The site is bordered to the northeast by Fifth Avenue, and to the north, west and south by single- and multi-family residential developments. The northern and eastern portions of the site have been developed with three buildings, an asphalt-paved parking lot and walkways, concrete flatwork and landscaping. San Rafael Creek and the existing culvert run roughly north/south through the eastern end of the property and terminate at a headwall where the creek transitions to open channel flow. The areas surrounding the culvert have been developed with landscaping and an asphalt pathway. The project area is relatively level with surface elevations at about 102 feet[2].

The existing ten-foot-tall by six-foot-wide section of arched CMP culvert which will be replaced is roughly 50-feet-long and extends from its connection with the existing concrete box culvert and terminates at the headwall. The culvert failure resulted in a sinkhole near the transition between the concrete and CMP structures and its development appears to have damaged a wood trellis just south of the culvert. A portion of the culvert has been removed and resulted in an approximately 15-foot-wide by 20-foot-long by 10-foot-deep open excavation. Spoils from this excavation have been temporarily stockpiled just east of the culvert. A separate 12-inch CMP storm drain parallels the western side of the culvert and is partially exposed within the sinkhole. Preliminary plans show the storm drain will be rerouted to discharge into the new culvert. Surface conditions within the project area are shown on Figure 1.

Field Exploration and Laboratory Testing

We explored subsurface conditions near the culvert on March 15, 2021 with two borings at the approximate locations shown on Figure 1. The borings were completed with a truck-mounted drill rig to approximate depths ranging from about 15.5 to 21.5 feet below the ground surface. The borings were logged by our Field Geologist and samples were obtained for classification

[2] Elevations referenced herein are based on those shown in the "(Preliminary) Alternative Analysis Study, Alt 2 – Construction RCB Culvert" by Coastland, dated May 2020. No vertical datum is specified.

and laboratory testing. We prepared boring logs based on soil descriptions in the field, as well as visual examination and testing of the soil samples in our laboratory. The boring logs are presented in Appendix A.

Geotechnical laboratory testing of soil samples from the borings included determination of moisture content, dry density, the percentage of particles passing a No. 200 sieve, gradation and unconfined compressive strength. The results of our geotechnical laboratory tests are presented on Figures A-1 through A-6 in Appendix A. We also obtained samples of the soils at various depths from each boring and combined the samples to form a single composite sample. The composite sample was tested for the presence of CAM 17 metals and total petroleum hydrocarbons (as gas, diesel and motor oil). These laboratory test results are provided in Appendix B and are discussed further in subsequent sections of this report.

Subsurface Conditions

Based on our field exploration, subsurface conditions are generally consistent with the regional geologic mapping and consist of predominantly sandy and clayey alluvial soils. The sandy soils are generally loose to medium dense and are classified under the Unified Soil Classification System as clayey sand with variable amounts of gravel (USCS soil type SC). The clayey soils are generally stiff to very stiff, of low to medium plasticity and are classified as silty clay with sand (USCS soil type CL). While not definitively identified in our borings, it is likely that some of the near-surface soils consist of fill which was derived from native soils that were reworked during previous site grading and culvert construction.

Groundwater was encountered in Boring 2 at about twelve feet below ground surface. Because the boring was not left open for an extended period of time and the clayey soils encountered in Boring 1 are of low permeability, a stabilized depth to groundwater may not have been observed at the boring locations. Groundwater elevations fluctuate seasonally and with changes in tidal elevations, and higher groundwater levels may be present during periods of intense rainfall and/or elevated flows within the creek channel.

Conclusions and Recommendations

Based on the results of our subsurface exploration, we judge that construction of the proposed culvert is feasible from a geotechnical standpoint. Primary geotechnical considerations for the project include providing appropriate temporary sloping or support for excavations, providing appropriate groundwater control measures in areas where excavations extend below the water table, and providing for proper foundation support and backfilling of the new culvert. Additional discussion and recommendations addressing these and other considerations are presented in the following sections.

Environmental Screening of Onsite Soil

As part of our Investigation, we obtained samples of the existing soils at the depths noted in each boring and composited the samples to form a single composite sample. The composite sample was analyzed to “screen” the soils for potential contamination. This included testing for the

presence of CAM 17 metals and total petroleum hydrocarbons as gas, diesel and motor oil. The results of the laboratory testing are included in Appendix B.

The San Francisco Bay Regional Water Quality Control Board has developed Environmental Screening Levels (ESLs) for use in screening sites for potential contamination (SFRWQCB, 2019). While the ESLs are not intended to establish policy or regulation, they are often used to help expedite the identification and evaluation of potential environmental concerns for a given site. The measured concentrations and corresponding ESL for the various contaminants are summarized in Table 1.

Table 1 – Comparison of Laboratory Test Results and SFRWQCB ESLs

Type of Testing	Chemical	Concentration from Laboratory Testing (mg/kg)	Tier 1 ESL Concentration for Soil (mg/kg)
CAM 17 Metals	Antimony	Not Detected	1.1E+01
	Arsenic	2.3	6.7E-02
	Barium	130	3.9E+02
	Beryllium	0.6	5.0E+00
	Cadmium	2.1	1.9E+00
	Chromium	73	1.6E+02
	Cobalt	23	2.3E+01
	Copper	35	1.8E+02
	Lead	46	3.2E+01
	Mercury	Not Detected	1.3E+01
	Molybdenum	Not Detected	6.9E+00
	Nickel	72	8.6E+01
	Selenium	Not Detected	2.4E+00
	Silver	Not Detected	2.5E+01
	Thallium	Not Detected	7.8E-01
	Vanadium	87	1.8E+01
	Zinc	83	3.4E+02
Total Petro. Hydro-cabons	TPH as Diesel	Not Detected	2.6E+02
	TPH as Gasoline	Not Detected	1.0E+02
	TPH as Motor Oil	Not Detected	1.6E+03

We note that the results of the laboratory testing include Arsenic, Cadmium, Lead and Vanadium levels which exceed the Tier 1 ESLs. The test results indicate that all of the other chemicals are

below the Tier 1 ESLs. As discussed in Chapter 12 of the SFRWQCB ESL User's Guide, the natural background concentration of a chemical can vary substantially and background concentrations which exceed the ESLs have been reported in the Bay Area. The User's Guide provides several sources for published background values for metals which could be considered for sites in the Bay Area. As shown in Table 2, the measured values of Arsenic, Lead and Vanadium from the analytical testing are within the published range of these background values while the 2.1 mg/kg measured for Cadmium exceeds the 1.7 mg/kg at the higher end of the range of background levels.

Table 2 – Comparison of Laboratory Test Results and Published Background Levels

Chemical	Concentration from Laboratory Testing (mg/kg)	Published Range of Background Level[1] (mg/kg)
Arsenic	2.3	0.6 to 11.0
Cadmium	2.1	0.05 to 1.7
Lead	46	14.3 to 107.9
Vanadium	87	39 to 288

1. Values taken from *Background Concentrations of Trace and Major Elements in California Soils*, published by the Kearney Foundation of Soil Science Division of Agriculture, March 1996.

Excavations, Temporary Shoring & Dewatering

Excavations of up to about 15 feet in depth will be required to remove and replace the existing culvert. Based on our subsurface exploration, excavations are expected to encounter variable subsurface conditions which include loose to medium dense sandy soils and stiff to very stiff clayey soils. In unsupported excavations, the sandy soils will be susceptible to flowing below groundwater and running to fast raveling above groundwater. The stiff to very stiff clayey soils are expected to exhibit firm behavior. Definitions of the various ground behaviors are presented in the Tunnelman's Ground Classification for Soils, Figure 4.

The stiff to very stiff clayey soils and loose to medium dense sandy soils should be considered Type "B" and "C" soil, respectively, pursuant with OSHA classifications. Temporary sloping or support of excavations will be required to ensure the safety of workers and to reduce the potential for failure of the excavation sidewalls and damage to surrounding improvements. While a variety of systems are available, shoring that applies positive pressure and immediate support to the side walls of the excavation will be more effective in controlling ground movements and reducing the risk of damage to nearby utilities and structures. Excavation stability and the structural design of temporary sloping or shoring should be made the sole responsibility of the Contractor, and the ultimate selection should be based on setbacks to property lines, cost, and other factors. If used, temporary shoring should be designed to resist the lateral earth pressures discussed below.

Groundwater was encountered in Boring 2 at about 12 feet below the ground surface and may be encountered at shallower depths if construction occurs during winter and spring. Temporary

dewatering will be required where excavations extend below the groundwater table. The selection, design, installation, monitoring, and removal of temporary dewatering should be the responsibility of the Contractor in accordance with their means and methods. The Contractor should be required to submit shoring and dewatering plans for review prior to implementation.

Culvert Design

While structural plans are not yet available, we understand the new concrete box culvert will be a six-foot-wide by eight-foot-tall cast-in-place structure with up to about eight feet of soil cover above. The new culvert can be supported on a relatively rigid mat slab foundation which can be integrated into the invert of the new structure. The mat slab foundation should be designed using an allowable bearing pressure of 3,500 pounds per square foot, a modulus of subgrade reaction of 225 pounds per square inch per inch and a minimum thickness of 12 inches. The bottom of the culvert excavation may extend below the groundwater table at some locations. In areas where the excavation bottom is soft, loose, or otherwise unstable, we recommend the areas be over-excavated a minimum of 12 inches below the culvert invert and backfilled with controlled low-strength material (CLSM).

The culvert should be designed to resist pressures from earth, hydrostatic and surcharge loads as shown on the Culvert Loading Diagram, Figure 5. The roof of the culvert structure will act to resist deflection of the sidewalls resulting in a “restrained” condition. Therefore, the structure should be designed to resist “at-rest” lateral earth pressure. Hydrostatic loading may be neglected if wall drainage is incorporated into the design. Wall drainage should consist of either Caltrans Class 1B permeable material within filter fabric or Caltrans Class 2 permeable material. A composite drainage panel such as Miradrain 6000 (or approved equivalent) could also be used. The drainage should be collected in a four-inch perforated PVC drain line at the base of the wall. The permeable material, if used, should extend at least 12 inches from the back of the wall and be continuous from the bottom of the wall to within 12 inches of the ground surface. A typical wall backdrain detail is presented on Figure 6.

Fill Materials and Compaction

Fill materials should generally consist of non-expansive materials that are free of organic matter, have a Liquid Limit of less than 45 (ASTM D 4318) and a Plasticity Index of less than 20 (ASTM D 4318). The fill material should contain no more than 50 percent of particles passing a No. 200 sieve and should have a maximum particle size of four inches. Onsite soils may be used for fill provided the soils meet the criteria described above. Any imported fill material needs to be tested to determine its suitability.

Fill materials should be moisture conditioned to just above the optimum moisture content prior to compaction. Properly moisture conditioned fill materials should subsequently be placed in loose, horizontal lifts of eight-inches-thick or less and uniformly compacted to at least 90 percent relative compaction. Where fill thicknesses are greater than five feet and small settlements would be objectionable, fill materials should be compacted to at least 92 percent relative compaction. In pavement areas, the upper 12 inches of fill should be compacted to at least 95 percent relative

compaction. The maximum dry density and optimum moisture content of fill materials should be determined in accordance with ASTM D1557.

Foundations for New Trellis

The plans show the existing wood trellis which was damaged as a result of the culvert failure will be reconstructed in roughly the same footprint. The structure can be supported on spread footings which are designed using the criteria in Table 3.

Table 3 – Spread Footing Design Criteria

Parameter	Design Value
Minimum Embedment	12 inches
Minimum Width	12 inches
Allowable Bearing Pressure[1, 2]	2,500 psf
Base Friction Coefficient	0.35
Lateral Passive Resistance[3]	300 pcf

Notes:
(1) Design shallow foundations to similar bearing pressures (i.e. size footing widths to main relatively uniform bearing loads).
(2) Increase design values by 1/3 for total design loads including seismic.
(3) Equivalent fluid pressure, not exceed 3,000 psf. Neglect upper 6 inches unless confined by concrete.

New Pavements & Flatwork

The planned work will likely include reconstructing portions of the existing walkways. In areas of new asphalt pavement and concrete flatwork construction, the subgrade should be prepared as discussed above except that the finished subgrade should be compacted to at least 95 percent relative compaction. For pedestrian walkways, asphalt pavement sections should consist of at least 2.5 inches of asphalt-concrete over at least four inches of Class 2 aggregate base. Exterior concrete walkway slabs and other concrete slabs that are not subjected to vehicle loads should be a minimum of four-inches-thick, reinforced with No. 4 reinforcing bars (not welded wire mesh) and underlain with four inches or more of Class 2 Aggregate Base. Class 2 aggregate base used for pavement and flatwork construction should conform to the most recent edition of Caltrans Standard Specifications.

Concrete slabs subject to vehicle loads should be a minimum of five-inches-thick and designed to resist traffic loading. We recommend crack control joints no farther than six feet apart in both directions and that the reinforcing bars extend through the control joints. Asphalt pavements subjected to vehicle loads should consist of at least three inches of asphalt-concrete over at least eight inches of Class 2 aggregate base[3]. The aggregate base should be moisture conditioned to

[3] Recommended pavement section assumes an R-value of 10 and Traffic Index of 4.0. Pavement design may be modified at the discretion of the Civil Engineer.

near optimum and compacted to at least 95 percent relative compaction. Some movement or offset at sidewalk joints should be expected as the underlying soils expand and shrink from seasonal moisture changes.

Supplemental Services

As project plans are nearing completion, we should review them to confirm that the intent of our geotechnical recommendations has been incorporated. We should also prepare a Geotechnical Plan Review letter for submission to the City, as is typically required for issuance of a building permit. During construction, we should be present intermittently to observe and/or test foundation installations, retaining wall drainage and backfill, preparation and compaction of subgrade and aggregate base in new pavement and flatwork areas, and other geotechnical-related work items. The purpose of our observation and testing is to confirm that site conditions are as anticipated, to adjust our recommendations and design criteria if needed, and to confirm that the Contractor's work is performed in accordance with the project plans and specifications.

We trust that this letter contains the information you require at this time. Please do not hesitate to contact us should there be any questions related to our report.

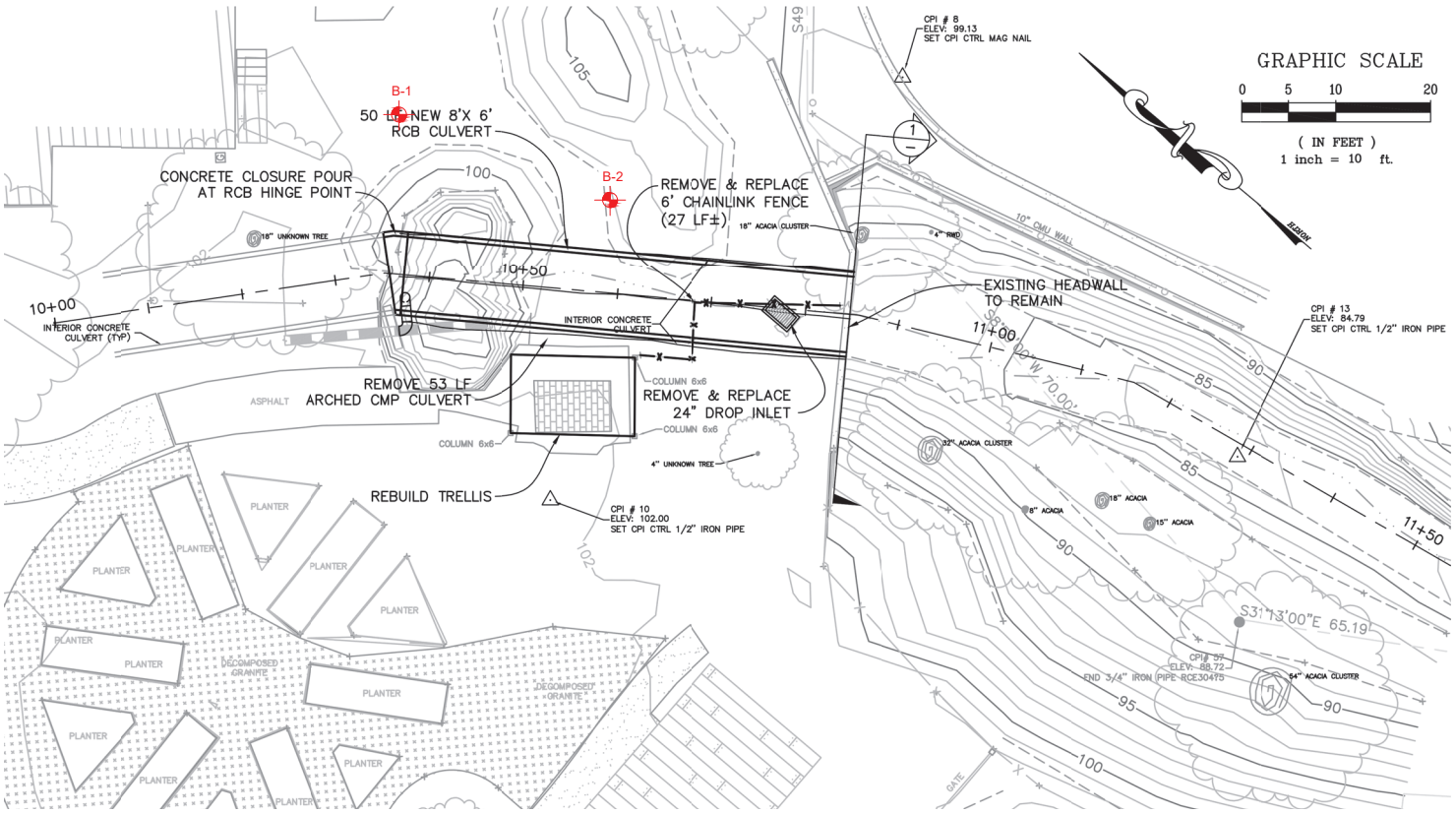
Very truly yours,
MILLER PACIFIC ENGINEERING GROUP

REVIEWED BY:

Rusty Arend
Geotechnical Engineer No. 3031
(Expires 6/30/21)

Mike Morisoli
Geotechnical Engineer No. 2541
(Expires 12/31/22)

Attachments: Figures 1 to 6, Appendices A and B



Legend:

Approximate boring location completed by MPEG, 2021

MPEG
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FILE: 1725.080 Figures.dwg

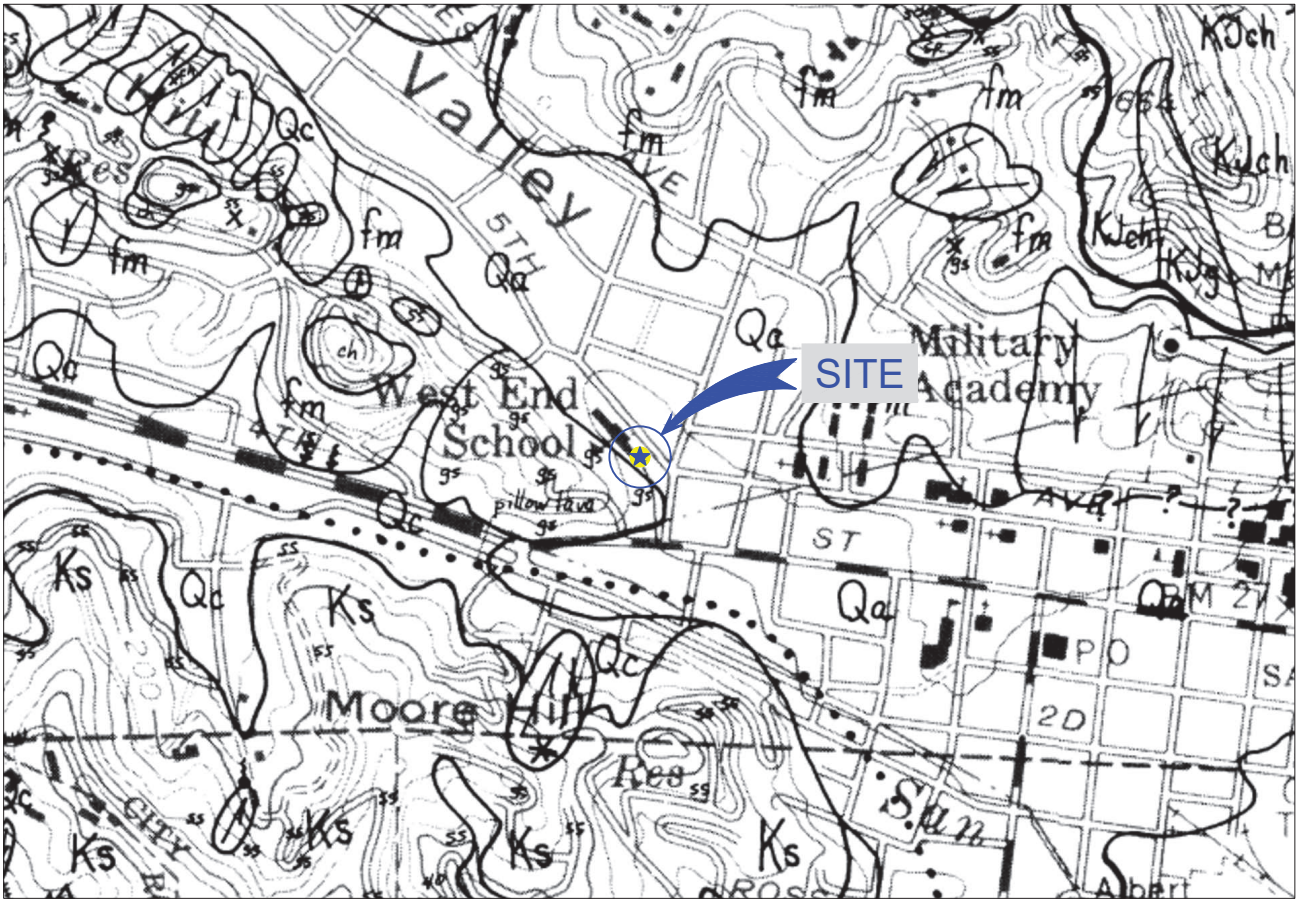
SITE PLAN

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 4/4/21

Designed
Drawn RCA
Checked

1
FIGURE



REGIONAL GEOLOGIC MAP

(NOT TO SCALE)

NORTH

LEGEND

Qa ALLUVIUM (Quaternary)
Unconsolidated deposits of clay, silt, sand and gravel underlying the bottom lands of the main stream valleys, consisting of materials transported and deposited by the streams.

Qa COLLUVIUM (Quaternary)
Unconsolidated and unsorted soil material and weathered rock fragments accumulated on or at the base of slopes by natural gravitational or slope wash processes.

Ks SANDSTONE AND SHALE (Jurassic to Cretaceous)
With very minor amounts of congolomerate.

fm FRANCISCAN MELANGE (Jurassic to Cretaceous)
A tectonic mixture consisting of small to large masses of resistant rock types, principally of sandstone, greenstone, chert and serpentine, embedded in a matrix of pervasively sheared or pulverized rock material.

Reference: California Division of Mines and Geology, "Geology of the Eastern Part of the San Rafael Area, Marin County, California, 1976.

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REGIONAL GEOLOGIC MAP

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 5/5/2018

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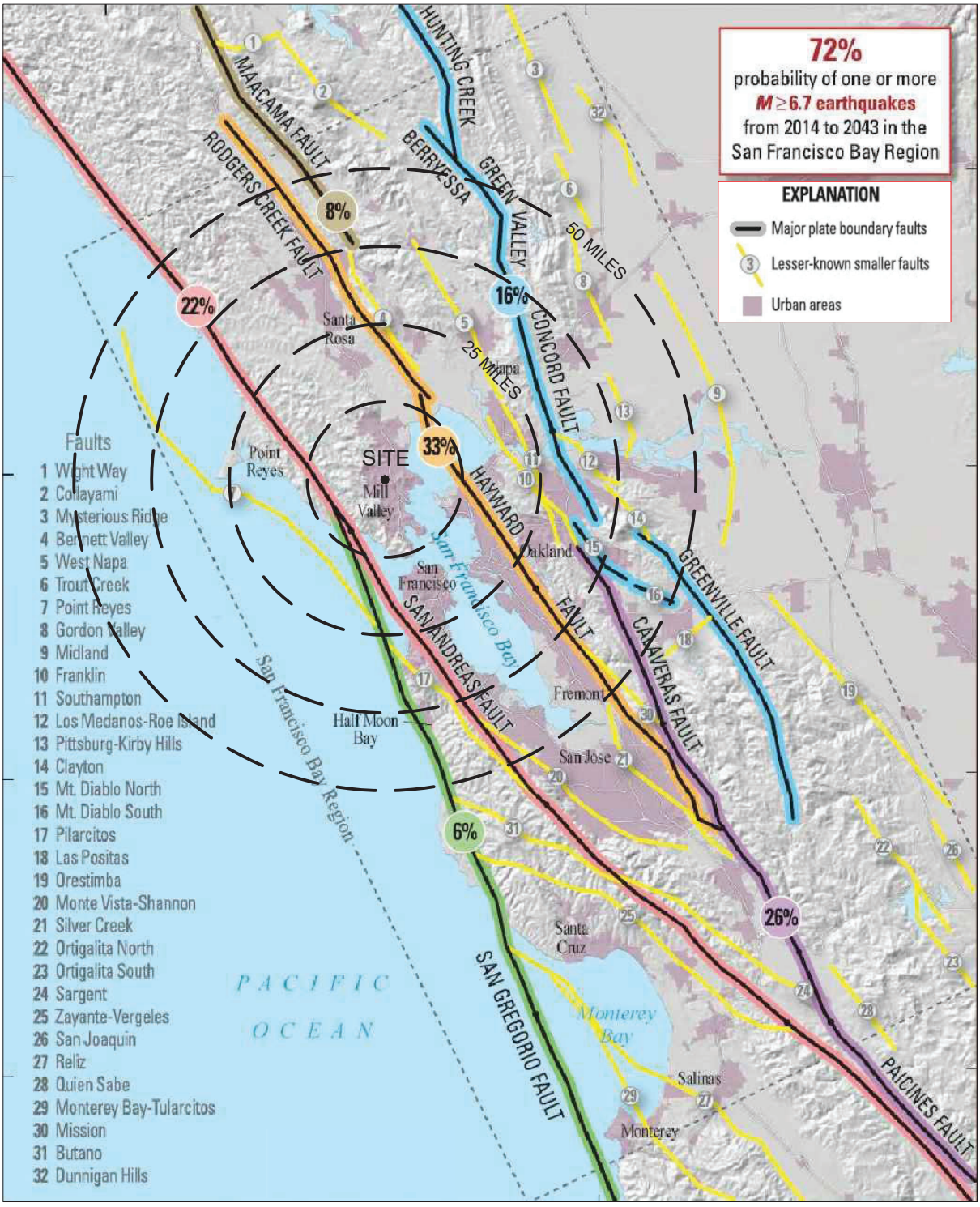
Checked

2
FIGURE



DATA SOURCE:

1) U.S. Geological Survey, U.S. Department of the Interior, "Earthquake Outlook for the San Francisco Bay Region 2014-2043", Map of Known Active Faults in the San Francisco Bay Region, Fact Sheet 2016-3020, Revised August 2016 (ver. 1.1).

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ACTIVE FAULT MAP

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 5/5/2018

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3
FIGURE

Tunnelman's Ground Classification for Soils[1]

Classification		Behavior	Typical Soil Types
Firm		Heading can be advanced without initial support, and final lining can be constructed before ground starts to move.	Loess above water table; hard clay, marl, cemented sand and gravel when not highly overstressed.
Raveling	Slow raveling ----- Fast raveling	Chunks or flakes of material begin to drop out of the arch or walls sometime after the ground has been exposed, due to loosening or to over-stress and "brittle" fracture (ground separates or breaks along distinct surfaces, opposed to squeezing ground). In fast raveling ground, the process starts within a few minutes, otherwise the ground is slow raveling.	Residual soils or sand with small amounts of binder may be fast raveling below the water tale, slow raveling above. Stiff fissured clays may be slow or fast raveling depending upon degree of overstress.
Squeezing		Ground squeezes or extrudes plastically into tunnel, without visible fracturing or loss of continuity, and without perceptible increase in water content. Ductile, plastic yield and flow due to overstress.	Ground with low frictional strength. Rate of squeeze depends on degree of overstress. Occurs at shallow to medium depth in clay of very soft to medium consistency. Stiff to hard clay under high cover may move in combination of raveling at excavation surface and squeezing at depth behind surface.
Running	Cohesive-running ----- Running	Granular materials without cohesion are unstable at a slope greater than their angle of repose (+/- 30° – 35°). When exposed at steeper slopes they run like granulated sugar or dune sand until the slope flattens to the angle of repose.	Clean, dry granular materials. Apparent cohesion in moist sand, or weak cementation in any granular soil, may allow the material to stand for a brief period of raveling before it breaks down and runs. Such behavior is cohesive-running.
Flowing		A mixture of soil and water flows into the tunnel like a viscous fluid. The material can enter the tunnel from the invert as well as from the face, crown, and walls, and can flow for great distances, completely filling the tunnel in some cases.	Below the water table in silt, sand, or gravel without enough clay content to give significant cohesion and plasticity. May also occur in highly sensitive clay when such material is disturbed.
Swelling		Ground absorbs water, increases in volume, and expands slowly into the tunnel.	Highly preconsolidated clay with plasticity index in excess of about 30, generally containing significant percentages of montmorillonite.

1 Modified by Heuer (1974) from Terzaghi (1950)

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TUNNELMANS CLASSIFICATION FOR SOIL

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 5/5/2018

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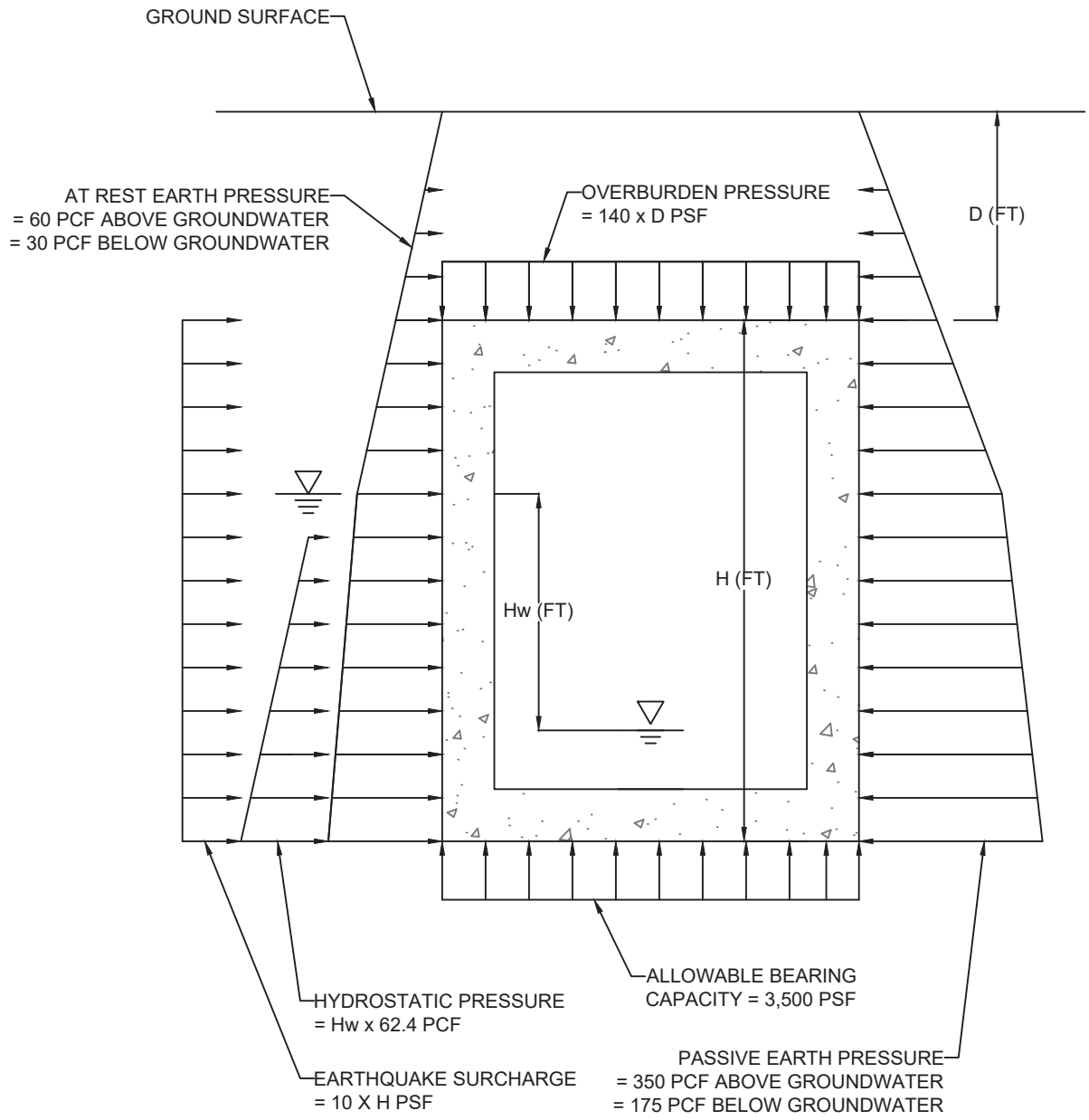
4
FIGURE



NOTES:

(1) GROUNDWATER LEVEL VARIES. ASSUME GROUNDWATER IS AT FIVE FEET BELOW GROUND SURFACE AT SOME POINT OVER THE DESIGN LIFE OF CULVERT

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FILENAME: 1725.080 Figures.dwg

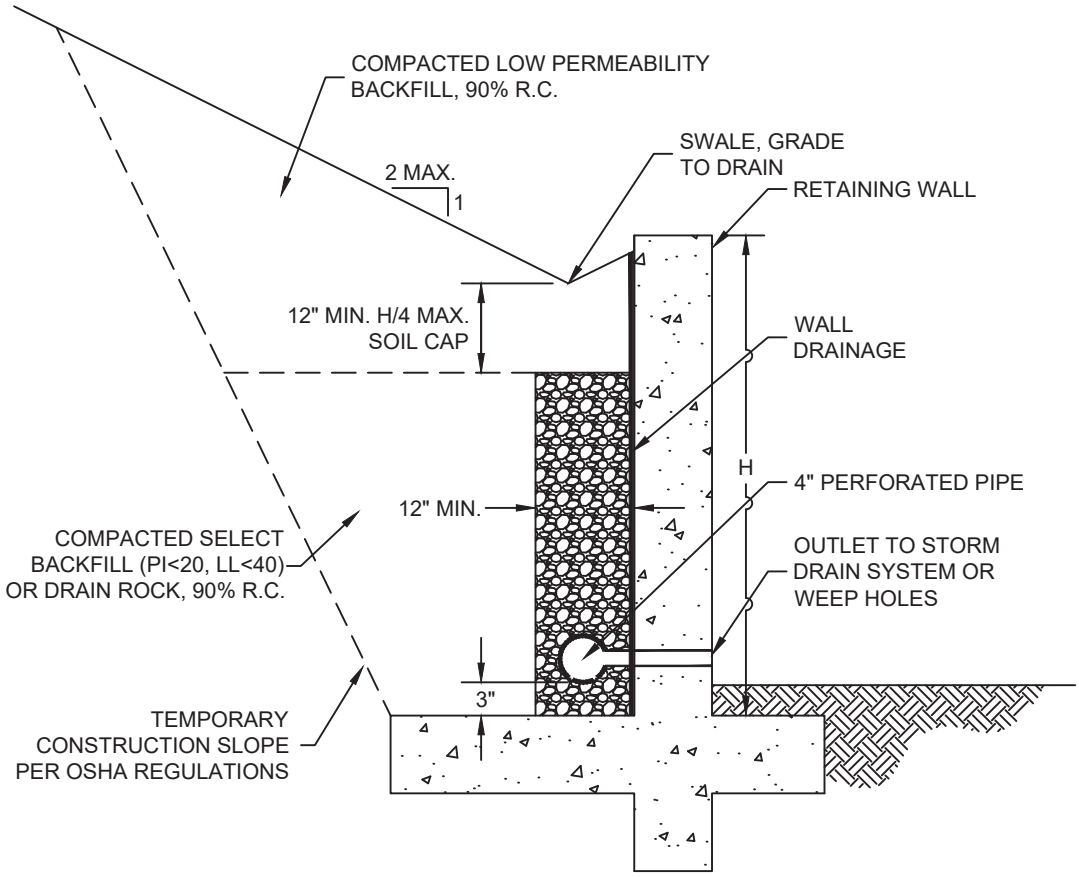
CULVERT LOADING DIAGRAM

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 5/5/2018

Drawn RCA
Checked

5
FIGURE



NOTES:

1. Wall drainage should consist of clean, free draining 3/4 inch crushed rock (Class 1B Permeable Material) wrapped in filter fabric (Mirafi 140N or equivalent) or Class 2 Permeable Material. Alternatively, pre-fabricated drainage panels (Miradrain G100N or equivalent), installed per the manufacturers recommendations, may be used in lieu of drain rock and fabric.

2. All retaining walls adjacent to interior living spaces shall be water/vapor proofed as specified by the project architect or structural engineer.

3. Perforated pipe shall be SCH 40 or SDR 35 for depths less than 20 feet. Use SCH 80 or SDR 23.5 perforated pipe for depths greater than 20 feet. Place pipe perforations down and slope at 1% to a gravity outlet. Alternatively, drainage can be outlet through 3" diameter weep holes spaced approximately 20' apart.

4. Clean outs should be installed at the upslope end and at significant direction changes of the perforated pipe. Additionally, all angled connectors shall be long bend sweep connections.

5. During compaction, the contractor should use appropriate methods (such as temporary bracing and/or light compaction equipment) to avoid over-stressing the walls. Walls shall be completely backfilled prior to construction in front of or above the retaining wall.

6. Refer to the geotechnical report for lateral soil pressures.

7. All work and materials shall conform with Section 68, of the latest edition of the Caltrans Standard Specifications.

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SCHEMATIC WALL BACKDRAIN

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 5/5/2018

Drawn RCA
Checked

6
FIGURE

APPENDIX A

SUBSURFACE EXPLORATION & GEOTECHNICAL LABORATORY TESTING

MAJOR DIVISIONS		SYMBOL		DESCRIPTION
COARSE GRAINED SOILS over 50% sand and gravel	CLEAN GRAVEL	GW		Well-graded gravels or gravel-sand mixtures, little or no fines
		GP		Poorly-graded gravels or gravel-sand mixtures, little or no fines
	GRAVEL with fines	GM		Silty gravels, gravel-sand-silt mixtures
		GC		Clayey gravels, gravel-sand-clay mixtures
	CLEAN SAND	SW		Well-graded sands or gravelly sands, little or no fines
		SP		Poorly-graded sands or gravelly sands, little or no fines
	SAND with fines	SM		Silty sands, sand-silt mixtures
		SC		Clayey sands, sand-clay mixtures
FINE GRAINED SOILS over 50% silt and clay	SILT AND CLAY liquid limit <50%	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL		Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays
		OL		Organic silts and organic silt-clays of low plasticity
	SILT AND CLAY liquid limit >50%	MH		Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
		CH		Inorganic clays of high plasticity, fat clays
		OH		Organic clays of medium to high plasticity
HIGHLY ORGANIC SOILS		PT		Peat, muck, and other highly organic soils
ROCK				Undifferentiated as to type or composition

KEY TO BORING AND TEST PIT SYMBOLS

CLASSIFICATION TESTS

PI	PLASTICITY INDEX
LL	LIQUID LIMIT
SA	SIEVE ANALYSIS
HYD	HYDROMETER ANALYSIS
P200	PERCENT PASSING NO. 200 SIEVE
P4	PERCENT PASSING NO. 4 SIEVE

STRENGTH TESTS

UC	LABORATORY UNCONFINED COMPRESSION
TXCU	CONSOLIDATED UNDRAINED TRIAXIAL
TXUU	UNCONSOLIDATED UNDRAINED TRIAXIAL
	UC, CU, UU = 1/2 Deviator Stress
DS (2.0)	DRAINED DIRECT SHEAR (NORMAL PRESSURE, ksf)

SAMPLER TYPE

- MODIFIED CALIFORNIA
- STANDARD PENETRATION TEST
- THIN-WALLED / FIXED PISTON
- HAND SAMPLER
- ROCK CORE
- X SAMPLE COMPOSITED FOR CAM 17 & TPH TESTING

SAMPLER DRIVING RESISTANCE

Modified California and Standard Penetration Test samplers are driven 18 inches with a 140-pound hammer falling 30 inches per blow. Blows for the initial 6-inch drive seat the sampler. Blows for the final 12-inch drive are recorded onto the logs. Sampler refusal is defined as 50 blows during a 6-inch drive. Examples of blow records are as follows:

25	sampler driven 12 inches with 25 blows after initial 6-inch drive
85/7"	sampler driven 7 inches with 85 blows after initial 6-inch drive
50/3"	sampler driven 3 inches with 50 blows during initial 6-inch drive or beginning of final 12-inch drive

NOTE: Test boring and test pit logs are an interpretation of conditions encountered at the excavation location during the time of exploration. Subsurface rock, soil or water conditions may vary in different locations within the project site and with the passage of time. Boundaries between differing soil or rock descriptions are approximate and may indicate a gradual transition.

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FILENAME: 1725.080 BL.dwg

SOIL CLASSIFICATION CHART

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 4/4/2021

Drawn EIC
Checked

A-1
FIGURE

FRACTURING AND BEDDING

Fracture Classification	Spacing	Bedding Classification
Crushed	less than 3/4 inch	Laminated
Intensely fractured	3/4 to 2-1/2 inches	Very thinly bedded
Closely fractured	2-1/2 to 8 inches	Thinly bedded
Moderately fractured	8 to 24 inches	Medium bedded
Widely fractured	2 to 6 feet	Thickly bedded
Very widely fractured	greater than 6 feet	Very thickly bedded

HARDNESS

Low	Carved or gouged with a knife
Moderate	Easily scratched with a knife, friable
Hard	Difficult to scratch, knife scratch leaves dust trace
Very hard	Rock scratches metal

STRENGTH

Friable	Crumbles by rubbing with fingers
Weak	Crumbles under light hammer blows
Moderate	Indentations <1/8 inch with moderate blow with pick end of rock hammer
Strong	Withstands few heavy hammer blows, yields large fragments
Very strong	Withstands many heavy hammer blows, yields dust, small fragments

WEATHERING

Complete	Minerals decomposed to soil, but fabric and structure preserved
High	Rock decomposition, thorough discoloration, all fractures are extensively coated with clay, oxides or carbonates
Moderate	Fracture surfaces coated with weathering minerals, moderate or localized discoloration
Slight	A few stained fractures, slight discoloration, no mineral decomposition, no affect on cementation
Fresh	Rock unaffected by weathering, no change with depth, rings under hammer impact

NOTE: Test boring and test pit logs are an interpretation of conditions encountered at the location and time of exploration. Subsurface rock, soil and water conditions may differ in other locations and with the passage of time.

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ROCK CLASSIFICATION CHART

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 4/4/2021

Drawn EIC
Checked

A-2
FIGURE

BORING 1

EQUIPMENT: Mobile B53 Hydraulic Drill Rig with 8.0-inch Hollow Stem Auger
DATE: 3/15/2021
ELEVATION: 102 feet*
*REFERENCE: Google Earth, 2021

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)		BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	OTHER TEST DATA	OTHER TEST DATA
0	0			Clayey SAND with Gravel (SC) brown, moist, medium dense, fine- to coarse-grained						
		X			21	124	10.6		27.4% P200, SA	
1	5	X		gravels decrease slightly	14	113	15.2			
2	10	X		Clayey SAND (SC) brown, wet, loose, medium- to very coarse-grained	10	108	18.0		14.9% P200	
		X			5		19.9			
4				Silty CLAY with Sand (CL) brown and gray with orange mottling, moist, stiff, low to medium plasticity						
	15	X			21	106	21.7	2825 UC		
5										
6	20	X		grades gray, trace organics						

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(4) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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FILENAME: 1725.080 BL.dwg

BORING LOG

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 4/4/2021

Drawn EIC
Checked

A-3
FIGURE

BORING 1 (CONTINUED)

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)		BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	OTHER TEST DATA	OTHER TEST DATA
	20	X		Silty CLAY with Sand (CL) gray, moist, stiff, low to medium plasticity, trace organics	15	95	28.3			
				Boring terminated at 21.5 feet No groundwater observed upon completion of drilling						
7										
	25									
8										
9	30									
10										
	35									
11										
12	40									

▽ Water level encountered during drilling

▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(4) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

MPEG MILLER PACIFIC ENGINEERING GROUP
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FILENAME: 1725.080 BL.dwg

BORING LOG

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 4/4/2021

Drawn EIC
Checked

A-4
FIGURE

BORING 2

EQUIPMENT: Mobile B53 Hydraulic Drill Rig with 8.0-inch Hollow Stem Auger
DATE: 3/15/2021
ELEVATION: 102 feet*
*REFERENCE: Google Earth, 2021

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)		BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	OTHER TEST DATA	OTHER TEST DATA
0	0			Clayey SAND with Gravels (SC) brown, moist, medium dense, fine- to coarse-grained						
		X			32	113	14.2		43.3% P200	
1				Clayey SAND (SC) medium to dark brown, moist, loose to medium dense, very fine- to medium-grained sand						
	5									
2		X		poor recovery, resampled with mod-cal	9					
3	10	X		grades darker gray-brown	12	112	17.7	600 UC		
		X		no recovery, resampledwith mod-cal	12					
4		X		grades green						
	15				22	119	13.1			
5				Boring terminated at 15.5 feet Boring caved up to 12 feet after augers were removed Groundwater measured at 12 feet upon completion						
6	20									

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(4) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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FILENAME: 1725.080 BL.dwg

BORING LOG

Rotary Manor
Culvert Replacement
San Rafael, California

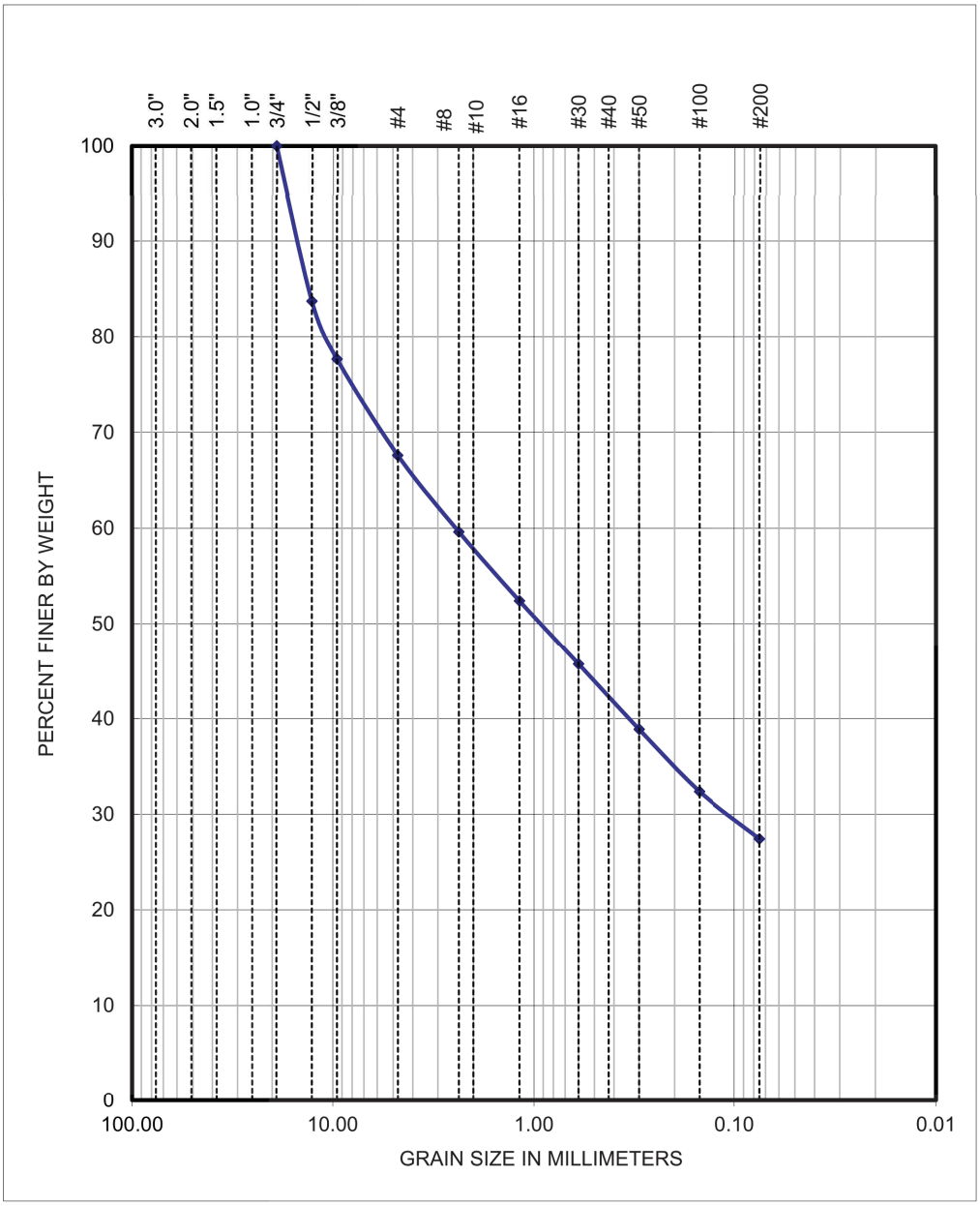
Project No. 1725.080 Date: 4/4/2021

Drawn EIC
Checked

A-5
FIGURE

MILLER PACIFIC ENGINEERING GROUP

PARTICLE SIZE ANALYSIS - ASTM D 6913 & ASTM D 1140



SYMBOL	SAMPLE SOURCE	CLASSIFICATION
◆	B1 @ 3.0'	Clayey SAND with Gravel (SC)

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SIEVE ANALYSIS RESULTS

Rotary Manor
Culvert Replacement
San Rafael, California

Project No. 1725.080 Date: 4/4/2021

Drawn EIC
Checked

A-6
FIGURE

APPENDIX B

ENVIRONMENTAL LABORATORY TESTING

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

31 March 2021

Miller Pacific Engineering - Novato
Attn: Ben Pappas
504 Redwood Blvd., Suite 220
Novato, CA 94947
RE: Soil Testing
Work Order: 21C2278

Enclosed are the results of analyses for samples received by the laboratory on 03/15/21 15:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanette Poplin

Jeanette L. Poplin For Stephen F. McWeeney
Lab Manager

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Miller Pacific Engineering - Novato	Project Manager: Ben Pappas	
504 Redwood Blvd., Suite 220	Project: Soil Testing	Reported:
Novato, CA 94947	Project Number: Coastland - Rotary Manor / 1725.080	03/31/21 12:58

Bay Area: 262 Rickenbacker Circle | Livermore, CA 94551 | T: 925-828-6226 | F: 925-828-6309 | ELAP# 2728
Central Valley: 9090 Union Park Way Suite 113 | Elk Grove, CA 95624 | T: 916-686-5190 | F: 916-686-5192 | ELAP# 2922
North Bay: 110 Liberty Street | Petaluma, CA 94952 | T: 707-769-3128 | F: 707-769-8093 | ELAP# 2303
San Diego: 2722 Loker Avenue West Suite A | Carlsbad, CA 92010 | T: 760-930-2555 | F: 760-930-2510 | ELAP# 3055

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Borings 1 & 2 - Composite	21C2278-01	Soil	03/15/21 15:30	03/15/21 15:30

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Miller Pacific Engineering - Novato	Project Manager: Ben Pappas	
504 Redwood Blvd., Suite 220	Project: Soil Testing	Reported:
Novato, CA 94947	Project Number: Coastland - Rotary Manor / 1725.080	03/31/21 12:58

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	ELAP#	Method	Note
Borings 1 & 2 - Composite (21C2278-01)		**Sample Type: Soil**				**Sampled: 03/15/21 15:30**			
Metals by EPA 6000/7000 Series Methods									
Antimony	ND mg/kg	2.0	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Arsenic	**2.3 mg/kg**	**1.5**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Barium	**130 mg/kg**	**2.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Beryllium	**0.61 mg/kg**	**0.50**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Cadmium	**2.1 mg/kg**	**2.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Chromium	**73 mg/kg**	**1.5**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Cobalt	**23 mg/kg**	**2.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Copper	**35 mg/kg**	**2.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Lead	**46 mg/kg**	**5.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Mercury	ND mg/kg	0.20	1	AC15017	03/24/21 11:39	03/25/21 11:44	2303	EPA 7471A	
Molybdenum	ND mg/kg	2.0	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Nickel	**72 mg/kg**	**5.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Selenium	ND mg/kg	5.0	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Silver	ND mg/kg	1.0	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Thallium	ND mg/kg	5.0	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Vanadium	**87 mg/kg**	**2.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
Zinc	**83 mg/kg**	**5.0**	1	AC14848	03/22/21 15:25	03/25/21 16:55	2303	EPA 6010B	
TPH by EPA GC Methods									
TPH as Diesel	ND mg/kg	5.0	1	AC14165	03/16/21 10:18	03/16/21 11:05	2303	EPA 8015B	
TPH as Gasoline	ND ug/kg	1000	1	AC13808	03/18/21 08:00	03/18/21 13:20	2303	EPA 8015B	
TPH as Motor Oil	ND mg/kg	50	1	AC14165	03/16/21 10:18	03/16/21 11:05	2303	EPA 8015B	
Surrogate: o-Terphenyl	*85.0 %*	*60-140*		*AC14165*	*03/16/21 10:18*	*03/16/21 11:05*	2303	*EPA 8015B*	
Surrogate: Trifluorotoluene (TFT)	*99.2 %*	*60-140*		*AC13808*	*03/18/21 08:00*	*03/18/21 13:20*	2303	*EPA 8015B*	

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
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Miller Pacific Engineering - Novato	Project Manager: Ben Pappas	
504 Redwood Blvd., Suite 220	Project: Soil Testing	Reported:
Novato, CA 94947	Project Number: Coastland - Rotary Manor / 1725.080	03/31/21 12:58

Notes and Definitions

QM-04	High RPD and/or poor percent recovery may reflect sample non-homogeneity.
QM-08	The RPD was outside acceptance limits for MS/MSD, possibly due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Alpha Analytical Laboratories Inc.
www.alpha-labs.com
WATERS, SEDIMENTS, SOLIDS

Corporate Laboratory (1551)
208 Mason Street, Ukiah CA 95482
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707.468.5267 (fax)
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North Bay Laboratory (2303)
110 Liberty Street, Petaluma CA 94952

Bay Area Laboratory (2728)
262 Rickenbacker Circle, Livermore CA 94551

Central Valley Laboratory (2922)
9090 Union Park Way #113, Elk Grove CA 95624

San Diego Service Center
2722 Loker Ave West, Ste A, Carlsbad CA 92010

Chain of Custody - Work Order

Reports and Invoices delivered by email in PDF format

Lab No 21C2278 Pg ____ of ____

Report to	Invoice to (if different)	Project Information
Company: Miller Pacific Engineering Group	**Contact:** Laura Hansen	**Project ID:** Rotary Manor
Attn: Rusty Arend	**Email address:** lhansen@millerpac.com	**Project No:** 1725.080
Address: 504 Redwood Boulevard, Suite 220 Novato, CA 94947	**Address:** 504 Redwood Boulevard, Suite 220 Novato, CA 94947	**PO Number:**
Phone/Fax: 415-382-3444 / 415-382-3450	**Phone/Fax:** 415-382-3444 / 415-382-3450	
Email Address: rarend@millerpac.com		

Signature below authorizes work under terms stated on reverse side.

Field Sampler - Printed Name & Signature: Emily Carreno

Sample Identification	Sampling Date	Sampling Time	Container: 40ml VOA Vial	Container: Plastic	Container: Glass	Container: Sleeve	Container: Other	Preservative: HCl	Preservative: HNO3	Preservative: H2SO4	Preservative: Other	Preservative: None	Matrix: Drinking Water	Matrix: Wastewater	Matrix: Soil	Matrix: Other	Total Number of Containers per Sample ID	Analysis Request: CAM 17 (EP:A 6010B/7471A)	Analysis Request: TPH, Diesel & Motor Oil (EPA 8015B)	Analysis Request: TPH, Gasoline (EPA 8015B)	Notes / DDW Source Codes
Borings 1 & 2 - Composite	3/15	15:30			X													X	X	X	Please composite all samples
																					and run one suite of tests on
																					the one composite sample

TAT
- Standard 10 days: (X)
- RUSH: 5 days ( ) 48 hours ( ) Other: ___days ( ) Preapproval required

TEMP °C
- Ukiah
- Livermore
- Elk Grove
- Petaluma 10.9
- Carlsbad

Relinquished by	Received by	Date	Time
Emily Carreno	[signature]	3/15/21	1530

DDW Write On EDT Transmission? ( ) Yes ( ) No

State **System** Number: _____

If "Y" please enter the Source Number(s) in the column above

CA Geotracker EDF Report? ( ) Yes ( ) No

Global ID: Sampling Company Log Code:

EDF to (Email Address):

Travel and Site Time:	Mileage:	Misc. Supplies: