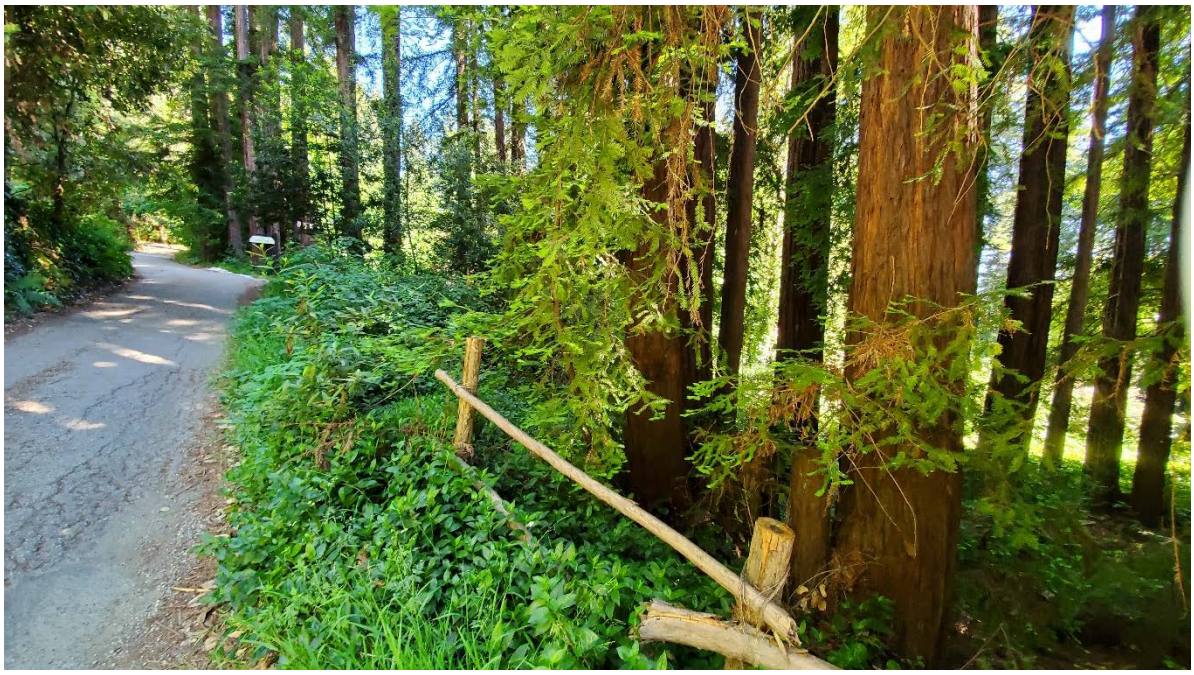

Redwood Park Tank Project

Final Initial Study – Mitigated Negative Declaration

prepared by

San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, California 95006
Contact: Carly Blanchard, Environmental Planner

prepared with the assistance of

Rincon Consultants, Inc.
437 Figueroa Street, Suite 203
Monterey, California 93940

December 2020

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
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Initial Study

1. Project Title

Redwood Park Tank Project

2. Lead Agency Name and Address

San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, California 95006

3. Contact Person and Phone Number

Carly Blanchard
Environmental Planner
831-338-2153 ext. 639

4. Project Location

The project would be located on a 6,534 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California.

5. Project Sponsor's Name and Address

San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, California 95006

6. General Plan Designation

Rural Residential (R-R)

7. Zoning

R-1-15 (Single-Family Residential)

8. Description of Project

Project Background

The San Lorenzo Valley Water District (SLVWD or District) was established in 1941 and serves several communities within the 136 square-mile San Lorenzo River watershed. SLVWD owns,

operates, and maintains three water systems supplying separate service areas from separate water sources. The North Service Area includes the unincorporated communities of Boulder Creek, Brookdale, and Ben Lomond. SLVWD serves an average of approximately 1.7 million gallons of water per day to approximately 7,900 service connections and a population of more than 22,000.

SLVWD will be retiring two aging and leaking 20,000-gallon water storage tanks, referred to as the "Swim Water Storage Tanks," located at 1045 Country Club Drive. Consequently, SLVWD needs new water storage infrastructure to support the North Service Area.

Project Description

The Redwood Park Tank Project ("proposed project" or "project") consists of the construction and operation of a new 125,000-gallon bolted steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. Figure 1 shows the regional location of the project site. Figure 2 shows the project location.

The project site is currently undeveloped. Figure 3 shows photographs of the existing project site. On the eastern side of the site, a cut slope descends to Dundee Avenue. A wooden fence stands approximately three feet north of the proposed tank location. The proposed footprint of the new 30-foot diameter water tank is clear of trees and thickly vegetated with ivy. A grove of native coast redwood and mixed hardwood species is located approximately 18 feet south of the proposed tank location.

The proposed project would require the removal of five trees: one small, suppressed coast redwood and four tanbark oak trees. Dead trees, branches, and secondary trunks would also be removed from the existing grove to improve grove health. The project would also involve post-construction revegetation of the site with five fruit and nut trees and three blackberry bushes.

Figure 4 shows the tank site plan. The project would construct the following infrastructure at the project site:

- 125,000-gallon bolted steel water storage tank (30 feet in diameter, 24 feet in height)
- Two water pumps, housed in an 80 square-foot pumping station made from concrete masonry and fire-resistant roofing
- Baserock surfaced or paved driveway
- 400 linear feet of 8-inch ~~high-density polyethylene (HDPE)~~ ductile iron water pipeline connecting the project site to the "Swim Water Storage Tanks" site on Country Club Drive
- Standby backup generator and propane tank for emergency power

Construction of the project is estimated to commence in Spring 2021 and last 12 months. Before commencement of construction, vegetation and roots would be cut back from the building area. Construction equipment could include an excavator, tractor box scraper, and bobcat. Construction activities would include soil excavation for ring footings, cut-and-fill grading to construct a level building pad for the water tank and apron, and re-densification of soil under the tank pad. Excavation would be up to a maximum of four feet in depth. A six-foot high fence would be constructed around the new water tank to partially block it from public view. Figure 5 shows a visual simulation of the proposed infrastructure and surrounding fencing. Fencing material would be a combination of wood and chain link, with wood serving as a visual barrier. The new water pipeline

Figure 1 Regional Location

Imagery provided by Esri and its licensors © 2020.

Project Location

N

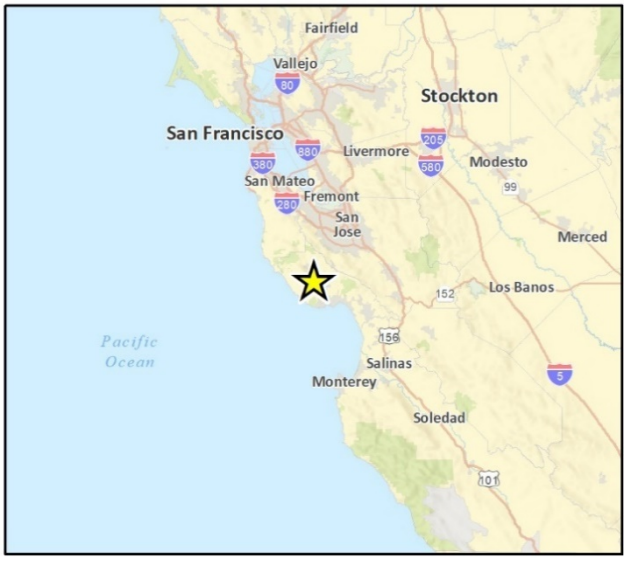


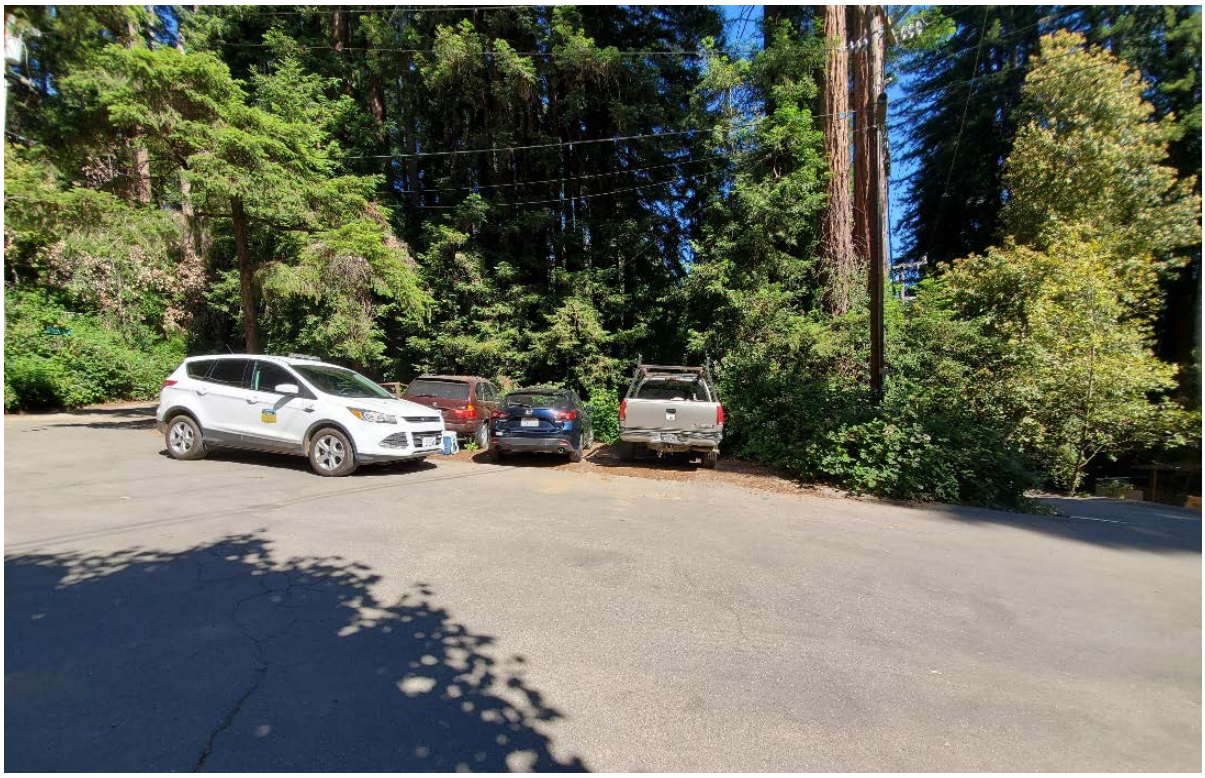
Figure 2 Project Location

Imagery provided by Microsoft Bing. ESRI, and their licensors © 2020.

Figure 3 Project Site Photographs

Photograph 1. Photo taken from Country Club Drive, outside the southwest corner of the proposed water tank site, facing northwest.

Photograph 2. Photo taken from center of proposed water tank site, facing east.



Photograph 3. Photo taken from Country Club Drive, facing north towards proposed water tank site.

Photograph 4. Photo taken along the proposed pipeline alignment, facing south on Country Club Drive.

Figure 4 Tank Site Plan

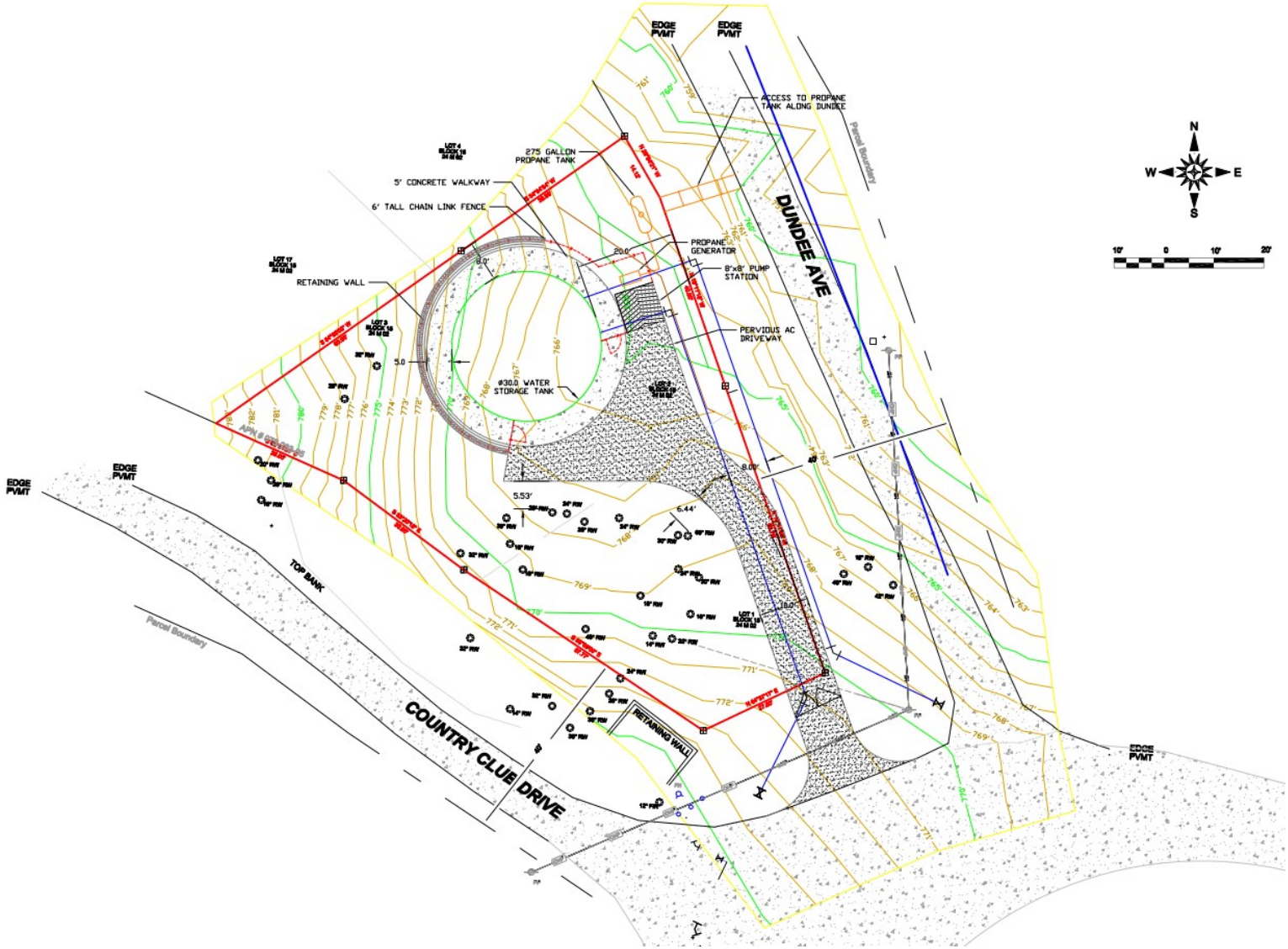


Figure 5 Tank Visual Simulation

would be located entirely underground within the paved roadway on Country Club Drive. Pipeline construction would take approximately ~~three~~ two weeks.

Construction staging of smaller equipment and materials would occur primarily within the boundaries of the project site. Larger equipment (e.g., water tank) may be temporarily staged at the large, flat, previously graded turnout off State Route (SR) 9 across from Highlands County Park at 8500 CA-9 in Ben Lomond. Construction staging would not involve ground disturbance. In addition, temporarily staged equipment would not occupy the entire turnout area. No lane closures of SR 9 would be required.

The Ben Lomond Fire Protection District has reviewed and approved the project site and construction area (Appendix G). In case of emergency, the Ben Lomond Fire Protection District would contact the construction contractor to restore road access immediately for emergency traffic. Further traffic control measures are discussed in Section 17, *Transportation*.

Operation and maintenance activities would be conducted by SLVWD employees, and would require approximately one trip per month to the project site. The pump station would operate up to three hours per day. The proposed project would require approximately 22,000 kilowatt hours (kWh), or 22 megawatt-hours (MWh) of electricity annually. The project also includes a liquid propane gas (LPG) generator for emergency backup energy supply.

Project Design Features

The sale agreement terms have been incorporated into the proposed project as the following Project Design Features:

- **Tree Care.** To ensure the protection of the trees and meet District requirements, during pre-construction and/or construction on the Property, the District will perform a construction impact assessment and develop a tree protection plan. The District will hire a Project Arborist to complete the following:
  - Locate, catalog and map trees/tree groups greater than 6 inches in trunk diameter growing within 20 feet of the limits of grading
  - Identify trees as to size, and trunk diameter
  - Rate individual tree health/structure and preservation suitability as “good, fair or poor”
  - Map critical root zones
  - Review grading, utility, drainage, building and landscape construction plans to determine potential impacts to trees
  - Identify trees with active disease organisms or structural weakness that present risk to the redefined use of the site
  - Provide recommendations for remedial treatments and maintenance to improve tree condition and decrease risk in preparation for construction
  - Create tree preservation specifications including a protection-fencing plan
  - Provide all findings in the form of a written report to the District accompanied by a Tree Location Map/Preservation Plan Vegetation
  - Promptly upon completion of construction on the Property, the District would reasonably replant vegetation on the Property with plants that are native to the neighborhood and wildlife friendly

- **Fencing.** The District would reasonably seek to minimize fencing around the water tank to be constructed on the Property, while ensuring enough distance between the tank and the fence for adequate access - usually eight lineal feet with necessary gates. Height of fencing shall be approximately six lineal feet. Fencing material would be a combination of wood and chain link, with wood serving as a visual barrier.
- **Rodent Control.** During construction on the Property, the District would purchase and reasonably install one owl nesting box to aid in rodent control.
- **Pump Station Enclosure.** The District would reasonably design and construct the pumping station enclosure from concrete masonry split-faced architectural tan block and fire-resistant roofing.
- **Trench Line and Roadway.** Promptly upon completion of construction on the Property, the District would repair open trenches and roadway in accordance with County of Santa Cruz design criteria (EP -1 Longitudinal Trench Detail and EP -2 Trench Cut Details).

In addition, the following Tree Preservation Specifications from the Tree Resource Assessment/Construction Impact Assessment/Tree Protection Plan (Appendix A) have been incorporated into the project as Project Design Features:

- **Preconstruction meeting with the Project Arborist.** A meeting with the Project Arborist, Project Manager, and all contractors involved with the project shall take place prior to project initiation All tree preservation specifications will be reviewed and discussed.
- **Field decisions.** The Project Arborist, Soils Engineer and Grading Contractor will work together to determine the most effective construction methods required to preserve and protect trees.
- **Tree Preservation Zone (TPZ) establishment.** TPZs shall be established as indicated on the attached map. The TPZs shall be delineated by chain link fencing, no less than 72 inches in height with metal stakes embedded in the ground. Rice straw bales shall be placed circumventing the fence perimeters where necessary as defined by the Project Arborist. Bales shall be stabilized by driving metal stakes or sections of #5 rebar through the bales 12 to 18 inches into the soil surface, one at each end of bale. The fencing will be installed prior to the onset of the project under the supervision of the Project Arborist and shall not be moved.
- **Restrictions within the TPZ.** No storage of construction materials, debris, or excess soil will be allowed within the TPZ. Parking of vehicles or construction equipment in this area is prohibited. Solvents, liquids or phytotoxic materials of any type shall never be stored or disposed of within the any TPZ and shall only be disposed of as prescribed by law.
- **Grade alterations.** Maintain the natural grade around all trees to be preserved. If tree roots are encountered during the construction process, the Project Arborist will be notified immediately. Exposed roots will be immediately covered with moistened burlap (or similar material) until the Project Arborist makes a determination as to required mitigation methods and extent of damage.
- **Trenching requirements.** Any areas of where trenching is proposed will be evaluated with the Project Arborist and the Contractor prior to excavation or construction.
- **Tree canopy alterations.** Unauthorized pruning of any tree on this site will not be allowed. Tree canopy alterations will be performed to the specifications established by the Project Arborist.
- **Supplemental irrigation.** Irrigation shall be provided using “soaker” hoses or similar method of slow delivery. Supplemental irrigation requirements shall be determined by the Project Arborist and will be required prior to and after completion of the grading.

- **Mulch layer.** A four to six inch layer of tree chip mulch shall be applied within the TPZ. A 12-inch distance from tree trunks will be maintained that is free of chips or organic material or excess soil accumulation.

The following recommendations from the Cultural Resources Assessment (Appendix C) and SLVWD contractor specifications have also been incorporated into the project as Project Design Features:

- **Worker's Environmental Awareness Program.** A qualified archaeologist will be retained to conduct a Worker's Environmental Awareness Program training for archaeological sensitivity for all construction personnel prior to the commencement of any ground disturbing activities. Archaeological sensitivity training should include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find.
- **Unanticipated Discovery of Cultural Resources.** If potential archaeological resources are discovered during subsurface excavations at the construction sites, SLVWD's construction contractor specifications require that the contractor halt construction operations at the location of the find and contact a qualified archaeologist to assess the value of the potential cultural resources. If cultural resources are encountered during ground-disturbing activities, work in the immediate area shall be halted and an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for California Register of Historical Resources eligibility. If the discovery proves to be significant under CEQA and cannot be avoided by the project, additional work such as data recovery excavation and Native American consultation and archaeological monitoring may be warranted to mitigate any significant impacts to cultural resources.

In addition, the following construction noise control measures have been incorporated into the project as Project Design Features:

- **Construction Hours Limits.** Construction shall be limited to Monday through Friday from 8:00 a.m. to ~~6:00~~ 5:00 p.m.~~, and Saturday from 9:00 a.m. to 6:00 p.m~~. No noise-generating work shall occur on Saturdays, Sundays, or federal holidays.
- **Construction Staging Areas and Stationary Equipment Locations.** The contractor shall select equipment staging areas and stationary noise-generating construction equipment locations as far as practicable from sensitive receivers.
- **Equipment Maintenance**. All contractors, as a condition of contract, shall be required to maintain and tune-up all construction equipment to minimize noise emissions.
- **Idling Prohibition and Enforcement.** Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would mean turning off equipment if it would not be used for five or more minutes.
- **Equipment Shielding.** Stationary equipment areas with appropriate acoustic shielding shall be designated on building and grading plans. Equipment and shielding shall be installed prior to construction and remain in designated location throughout construction activities. Impact noise producing equipment (i.e., jackhammers and pavement breaker[s]) shall be equipped with noise attenuating shields, shrouds, or portable barriers or enclosures to reduce operating noise.
- **Mufflers.** All diesel equipment shall be operated with closed engine doors and shall be equipped with properly operating and maintained residential grade mufflers. Pneumatic impact tools and

equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers.

- **Electrically-Powered Tools and Facilities.** Whenever feasible, electrical power shall be used to run air compressors and similar power tools rather than diesel equipment.
- **Pre-Construction Notification.** Prior to construction, written notification that identifies the type, duration, and frequency of construction activities shall be provided to residents within 100 feet of the project site.

9. Surrounding Land Uses and Setting

Land uses around the project site are predominantly residential. The proposed tank site is bordered on the west and south by Country Club Drive, Dundee Avenue to the east, and a single-family residence to the north. The pipeline alignment is bordered by residences to the east and west along Country Club Drive.

10. Other Public Agencies Whose Approval is Required

- State Water Resources Control Board, Drinking Water Branch: Review/Approval of Change in Water System Operation Permit
- County of Santa Cruz: Potential Encroachment Permit for Work in Public Right-of-Way

Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving at least one impact that is "Potentially Significant" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

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

Determination

Based on this initial evaluation:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potential 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	Date
Printed Name	Title

Environmental Checklist

1 Aesthetics

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	■
b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	■
c. 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 a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	■	☐
d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	■

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

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

The project site is located in a rural mountainous area in San Lorenzo Valley. The project site is not located within a scenic vista or view corridor as designated by the County of Santa Cruz (County of Santa Cruz 1994). ~~State Route (~~SR~~)~~ 9, located approximately 0.3-mile to the east of the project site is a designated scenic road in the Santa Cruz County General Plan (County of Santa Cruz 1994).

As is shown in Figure 3, Site Photographs, the project is generally screened from view by existing topographical and elevation changes as well as tree cover. Due to intervening topography, the project site is not visible from SR 9. Larger equipment may be temporarily staged at the large, flat, previously graded turnout off SR 9 across from Highlands County Park. This temporary staging area would be visible from SR 9, a designated scenic road. However, the proposed project would not substantially damage scenic resources within a state scenic highway. The turnout is previously disturbed and graded, has been used as a construction staging area for other local SLVWD projects, and does not contain scenic resources such as trees, rock outcroppings, or historic buildings. Upon

completion of construction, temporarily staged equipment would be removed and the turnout would return to pre-construction conditions.

The project site is not visible from a designated vista point nor is it within a scenic view. The project would not obstruct or remove scenic views as none exist in the area, and therefore, the project would have no impact on a scenic vista or scenic resources within a state scenic highway.

NO IMPACT

c. *Would the project, 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 a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

The project site is currently undeveloped, and is located in a non-urbanized area. Figure 3 shows photographs of the existing project site. The project site is located within a second-growth redwood forest in the Santa Cruz Mountains. The visual character of the surrounding area is characterized by mountainous terrain, redwoods, and single-family homes on large lots.

Forty-six existing trees on the project site would be preserved and protected. The proposed project would require the removal of five trees: one small, suppressed coast redwood and four tanbark oak trees. Dead trees, branches, and secondary trunks would also be removed from the existing grove to improve grove health. However, the project would also involve post-construction revegetation of the site with five fruit and nut trees and three blackberry bushes.

Upon completion of construction, the new water pipeline connecting the site to the "Swim Water Storage Tanks" site on Country Club Drive would be located entirely underground and would not be visible. Promptly upon completion of construction, SLVWD would repair open trenches and roadway in accordance with County of Santa Cruz design criteria.

The proposed project would result in installation of a new steel water storage tank on an undeveloped site. The new tank would be 30 feet in diameter and 24 feet in height. A six-foot high fence would be constructed around the new water tank to partially block it from public view. Fencing material would be a combination of wood and chain link, with wood serving as a visual barrier. The project would also require the addition of a water pump station, a driveway, and a standby backup generator and propane tank to the site. Some of these components would be visible from the adjacent roadways. Figure 5 shows a visual simulation of the proposed infrastructure and surrounding fencing, as would be seen from the project site itself. Public views would be further blocked by trees on the project site.

Due to the steep terrain in the area and existing tree cover, the majority of the project site is blocked from public view. In addition, water storage facilities are part of the water system infrastructure and aesthetic landscape in the San Lorenzo Valley. SLVWD plans to paint the tank in a muted color that blends with the surrounding forest colors, which would further reduce the visual prominence of the structure. As previously discussed, the temporary construction staging area off SR 9 is previously disturbed and has been used as a staging area for other local projects. Thus, the proposed project would not result in a substantial degradation to the visual quality of the site or surrounding, and this impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

The proposed infrastructure does not include lighting. The facility would be painted in a muted color/tone that blends with the surrounding forest colors. Thus, the project would not result in impacts related to creation of a new source of light or glare. No impact would occur.

NO IMPACT

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2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on 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?	☐	☐	☐	■

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b. Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

The project site is located in a forested rural area and is not in agricultural production or located adjacent to or near agricultural lands. The project site does not contain any lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation. In addition, the project does not contain Farmland of Local Importance or Grazing

Land that would be converted to a non-agricultural use. The project site is designated "Urban and Built-Up Land," which is not an agricultural designation (California Department of Conservation 2018). There are no Williamson Act contracts on the property. Thus, the proposed project would not result in or lead to the conversion of agricultural lands. No impact would occur.

NO IMPACT

c. Would the project 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. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

The project site is not zoned as Timberland Preserve, and is not located adjacent to lands zoned Timberland Preserve. Thus, the project would not conflict with zoning of lands that have a Timberland Preserve designation. The site is not identified as having timber resources in the County's GIS mapping system (County of Santa Cruz 2020).

The proposed project would require the removal of five trees: one small, suppressed coast redwood and four tanbark oak trees. Dead trees, branches, and secondary trunks would also be removed from the existing grove to improve grove health. However, the project would also involve post-construction revegetation of the site with five fruit and nut trees and three blackberry bushes.

The trees to be removed are not considered to be forest resources or forest land under state definitions; the site and surrounding forestland are not managed for the production of forest products or traditional forest uses, but are comprised of residential uses within a wooded setting. Thus, the proposed project would not result in or lead to conversion of forest lands. No impact related to forest lands would occur.

NO IMPACT

e. Would the project 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?

The project would provide water storage infrastructure to support the SLVWD's North Service Area. As discussed in detail in Section 14, *Population and Housing*, the project would not be growth-inducing. Furthermore, the project site is not located adjacent to Farmland or forest land. Thus, the proposed project would not involve other changes in the existing environment which could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

NO IMPACT

3 Air Quality

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

The project site is within the North Central Coast Air Basin (NCCAB), which consists of Monterey, Santa Cruz, and San Benito counties and forms an area of more than 5,100 square miles (Monterey Bay Air Resources District [MBARD] 2008). The NCCAB is under the regulatory jurisdiction of the MBARD, which is the local air quality management agency that is required to monitor air pollutant levels to ensure that National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are met and, if they are not met, to develop strategies to meet the standards.

Depending on whether or not the standards are met or exceeded, the NCCAB is classified as being in "attainment" or "nonattainment" for a particular air pollutant. The MBARD's 2016 Air Quality Management Plan (AQMP) assesses the attainment status of the NCCAB. The NAAQS and CAAQS attainment statuses for the NCCAB are listed in Table 1. As shown in the table, the NCCAB is in nonattainment only for the state standards for eight-hour ozone (O_3) and particulate matter 10 microns in diameter or less in size (PM_{10}; MBARD 2017). The NCCAB is in attainment or unclassified for all other state and federal ambient air quality standards.

Table 1 North Central Coast Air Basin Attainment Status

Pollutant	Standard	Designation
1-Hour Ozone	NAAQS	Attainment
	CAAQS	Attainment
8-Hour Ozone	NAAQS	Attainment
	CAAQS	**Nonattainment**
CO	NAAQS	Attainment
	CAAQS	Attainment/Unclassified[1]
NO_2	NAAQS	Attainment
	CAAQS	Attainment
SO_2	NAAQS	Attainment
	CAAQS	Attainment
PM_{10}	NAAQS	Attainment
	CAAQS	Nonattainment
$PM_{2.5}$	NAAQS	Attainment
	CAAQS	Attainment
Lead	NAAQS	Attainment
	CAAQS	Attainment

NAAQS: National Ambient Air Quality Standards; CAAQS: California Ambient Air Quality Standards; CO: carbon monoxide; PM_{10}: particulate matter 10 microns in diameter or less in size; $PM_{2.5}$: particulate matter 2.5 microns in diameter or less in size; NO_2: nitrogen dioxide; SO_2: sulfur dioxide

[1] Monterey County is classified as in Attainment and San Benito and Santa Cruz counties are listed as Unclassified.

Source: MBARD 2017

Air Quality Management

Under California law, the MBARD is required to prepare a plan for air quality improvement for pollutants for which the MBARD is in non-compliance. In March 2017, SLVWD adopted the *2012-2015 Air Quality Management Plan* (2016 AQMP), which assesses and updates elements of the 2012 AQMP, including the air quality trends analysis, emission inventory, and mobile source programs. The 2016 AQMP addresses ways in which the MBARD can achieve attainment of the state 8-hour ozone standard in the NCCAB. In 2012, the United States Environmental Protection Agency designated the NCCAB as in attainment for the current national 8-hour ozone standard of 0.075 parts per million (ppm). In October 2015, the national standard was reduced to 0.070 ppm. However, the NCCAB continues to be in attainment with the federal ozone standard (MBARD 2017).

Air Emission Thresholds

The MBARD has issued criteria for determining the level of significance for project-specific impacts within its jurisdiction in accordance with the NAAQS and CAAQS.

Construction

Based on criteria set forth in the MBARD's *CEQA Air Quality Guidelines* (MBARD 2008), construction projects using typical construction equipment (e.g., dump trucks, scrappers, bulldozers, compactors,

and front-end loaders) are already accommodated in the emission inventories of state- and federally-required air plans, and therefore would not have a significant impact related to precursors of ozone (volatile organic compounds [VOC] and oxides of nitrogen [NO_X]). Construction activities (e.g., excavation, grading, on-site vehicles) which directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors. Sensitive receptors typically include residences, schools, healthcare facilities, and other live-in housing facilities such as prisons or dormitories. Construction of the proposed infrastructure would occur upwind of nearby residential sensitive receptors. Therefore, the PM_{10} threshold of 82 pounds per day would apply to the proposed project's construction activities.

MBARD's *CEQA Air Quality Guidelines* also identify screening thresholds for the evaluation of PM_{10} emissions. Construction projects with less than 8.1 acres per day of minimal earthmoving or 2.2 acres per day of earthmoving (grading, excavation) are assumed to be below the PM_{10} threshold of 82 pounds per day (MBARD 2008).

Operation

MBARD's *CEQA Air Quality Guidelines* identifies quantitative operational thresholds for VOC and NO_X, carbon monoxide (CO), oxides of sulfur (SO_X), and PM_{10}. The proposed project's impacts on criteria air pollution would be significant if the project would be inconsistent with the adopted AQMP or would result in air pollutant emissions during construction or operation that exceed the thresholds in Table 2.

Table 2 Criteria Pollutant Thresholds of Significance

Pollutant/Precursor	Maximum Construction Emissions (lbs/day)	Maximum Operational Emissions (lbs/day)
VOC/NO_X	n/a	137
CO	n/a	550
SO_X	n/a	150
PM_{10}	82[1]	82

lbs/day = pounds per day; CO = carbon monoxide; NO_X = oxides of nitrogen; SO_X = oxides of sulfur; PM_{10} = particulate matter with a diameter of 10 microns or less; VOC = volatile organic compounds (also referred to as reactive organic gases [ROG]).

[1] This threshold only applies if construction is located nearby or upwind of sensitive receptors. In addition, a significant air quality impact related to PM_{10} emissions may occur if a project uses equipment that is not "typical construction equipment" as specified in Section 5.3 of the MBARD's *CEQA Air Quality Guidelines*.

Source: MBARD 2008

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

A project may be inconsistent with the AQMP if it would generate population growth exceeding the forecasts used in the development of the AQMP. The project does not include new housing or businesses, nor would operation and maintenance of the project components require new employees; therefore, the project would not directly result in population growth. The proposed project would expand the water storage capacity of existing water infrastructure. The project would not directly induce population growth because the increased capacity is intended to serve existing demand, accommodate planned growth, and improve performance reliability rather than to serve additional new growth. The MBARD *CEQA Air Quality Guidelines* (2008) states indirect emissions

from a proposed non-residential project intended to meet the needs of the population are consistent with the AQMP if the current population of the county does not exceed the AQMP population forecasts. The current population of Santa Cruz County is estimated at 271,233, and according to the Association of Monterey Bay Area Governments (AMBAG), the population of Santa Cruz County is forecast to reach 308,582 by 2035 (California Department of Finance 2020; AMBAG 2014). Therefore, the project would not indirectly induce population growth above that anticipated by the AQMP and would not conflict with or obstruct implementation of the AQMP. No impact would occur.

NO IMPACT

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The project would generate short-term emissions associated with project construction and long-term emissions associated with operation and maintenance of the new water tank and pump station.

Construction Emissions

Project construction would generate temporary air pollutant emissions. These impacts are associated with fugitive dust and exhaust emissions from heavy construction equipment.

As discussed under *Significance Thresholds*, construction projects with less than 2.2 acres per day of earthmoving (grading, excavation) are assumed to be below the PM_{10} threshold of 82 pounds per day (MBARD 2008). The entire project area totals less than one acre. Therefore, there would be less than 2.2 acres per day of earthmoving, and the project is assumed to be below PM_{10} threshold of 82 pounds per day. In addition, compliance with the MBARD's Rule 400 (Visible Emissions), Rule 403 (Particulate Matter), Rule 425 (Use of Cutback Asphalt), and Rule 426 (Architectural Coatings) would reduce emissions of dust particulates and VOCs during construction activity. During construction the project sites would be watered ~~once~~ twice daily to control fugitive dust emissions, which would further reduce PM_{10} and $PM_{2.5}$ emissions.

Consequently, construction-related air quality impacts would be less than significant.

Operational Emissions

Although the proposed project would result in an expansion of water storage capacity, long-term emissions generated by increased electricity demand from the pump station are not included in this analysis because these emissions are emitted elsewhere, and air quality is a local issue. In addition, electricity suppliers are regulated separately by MBARD as stationary sources.

Monthly maintenance trips would generate negligible operational emissions. Emissions would not exceed the MBARD thresholds for any criteria pollutant. Therefore, operation of the proposed project would have a less than significant operational air quality impact.

LESS THAN SIGNIFICANT IMPACT

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Certain population groups, such as children, the elderly, and people with health problems, are particularly sensitive to air pollution. Sensitive receptors are defined as land uses that are more

likely to be used by these population groups and include health care facilities, retirement homes, school and playground facilities, and residential areas. As previously stated, the project site is located adjacent to residential receptors.

As discussed under items a and b above, the project's construction emissions would not exceed the applicable MBARD PM_{10} threshold, which is designed to be protective of public health. Project grading and construction could involve the use of diesel trucks and equipment that will emit diesel exhaust, including diesel particulate matter, which is classified as a toxic air contaminant. Nearby residents could potentially be exposed to construction-related diesel emissions. Construction-related diesel emissions would be of limited duration (i.e., primarily during grading) and would be temporary. The California Air Resources Board (CARB) has identified diesel exhaust particulate matter as a toxic air contaminant, and assessment of toxic air contaminant cancer risks is typically based upon a 70-year exposure period. Project grading and construction activities that would utilize diesel-powered equipment would expose receptors to possible diesel exhaust for a very limited number of days over the estimated 12-month construction period. Because exposure to diesel exhaust will be well below the 70-year exposure period, and given the limited, intermittent and short-term duration of construction activities that would use diesel equipment, construction-related diesel emissions are not considered significant. Furthermore, the state has been implementing emission standards for different classes of on- and off-road diesel vehicles and equipment that applies to off-road diesel fleets and includes measures such as retrofits that continue to reduce diesel emissions. Additionally, Title 13 of the California Code of Regulations (section 2485(c)(1)) prohibits idling of a diesel engine for more than five minutes in any location. Consequently, the project would not expose sensitive receptors to substantial diesel pollutant concentrations.

Traffic-congested roadways and intersections have the potential to generate high localized carbon monoxide (CO) levels (i.e., CO hotspots). In general, CO hotspots occur in areas with poor circulation or areas with heavy traffic. As discussed above, operation of the project would generate nominal new pollutant emissions, including CO emissions, because the project would require negligible maintenance trips. In addition, the local roads are lightly traveled and not congested. Therefore, the project would not result in CO hotspots on adjacent roadways.

The project would not expose sensitive receptors to substantial pollutant concentrations, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

According to the MBARD *CEQA Air Quality Guidelines* (2008), land uses associated with odor complaints typically include landfills, agricultural uses, wastewater treatment plants, food processing plants, chemical plants, refineries, and landfills. The proposed project does not include construction activities that are generally associated with the creation of objectionable odors. Upon completion of construction, there would be no long-term operations associated with the water storage tanks that would result in generation of odors. No impact related to odors would occur.

NO IMPACT

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4 Biological Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife 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?	☐	☐	☐	■

The impact analysis presented in this section is based on field reconnaissance survey of the project site conducted on May 26, 2020, and review of background information including pertinent primary literature and review of natural resource occurrence databases, resource agency special status species lists, and the Tree Resource Analysis/Construction Impact Assessment/Tree Protection Plan prepared for the project (James P. Allen and Associates 2020, Appendix A). Occurrence records from the California Department of Fish and Wildlife (CDFW; 2020) California Natural Diversity Database (9-quad search area), the California Native Plant Society (2020) Inventory of Rare and Endangered Plants, and the United States Fish and Wildlife Service (USFWS; 2020) Information for Planning and Consultation (USFWS 2020) were reviewed to identify sensitive species known to occur in the region (Appendix B). The off-site construction staging area does not contain sensitive biological habitat or other biological resources due to its location and the previously disturbed, graded nature of the highway turnout; this analysis therefore focuses on the project site itself.

Existing Conditions

The water tank project site consists of a sloped off-road area and associated coast redwood forest habitat with a sparse non-native understory. Tree cover is dominated by second-growth coast redwood (*Sequoia sempervirens*) with other tree species including tan oak (*Notholithocarpus densiflorus*) and California bay (*Umbellularia californica*). There is a sparse forest understory that includes mostly canary ivy (*Hedera canariensis*), big leaf periwinkle (*Vinca major*), Himalayan blackberry (*Rubus armeniacus*) and some French broom (*Genista monspessulana*). All impacts will occur within this habitat type. The pipeline alignment is a previously disturbed, paved roadway.

Special Status Species

Special-status species are those plants and animals that are: 1) listed, proposed for listing, or candidates for listing as Threatened or Endangered by the USFWS and National Marine Fisheries Service under the federal Endangered Species Act; 2) listed or proposed for listing as Rare, Threatened, or Endangered by the CDFW under the California Endangered Species Act; 3) recognized as Species of Special Concern by the CDFW; and/or 4) occurring on lists 1 and 2 of the CDFW California Rare Plant Rank system.

The areas surrounding the Redwood Park Tank Project provide suitable habitat for a number of special status plant and wildlife species that are known to occur in the region. A total of 96 special status species (59 plants and 37 animals) were evaluated for their potential to occur in the project area (Appendix B). The listed plant species identified from the desktop literature review predominantly require one of the following habitats: aquatic, freshwater marsh, coastal dune/scrub, Sandhills, serpentine or grassland. None of these habitats are present in the project site. Of the 96 special status species evaluated, 85 were excluded based on the lack of suitable habitat or because the project area is outside of current geographic distributions. Additionally, those species that are sensitive to human disturbance and not known to occur in areas of residential development could be eliminated based on the location of the site within a residential development. The remaining ten species were evaluated for potential impacts as a result of project development.

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

Impacts to Special Status Plants

One special status plant - minute pocket moss (*Fissidens pauperculus*) - was determined to have the potential to occur within the project area and was evaluated for potential impacts from project development (Appendix B). This species is considered a "special status" species due to its rare occurrence, but it is not state or federally listed. Impacts to non-listed species would only be considered significant under CEQA if those impacts were to result in an adverse effect (i.e., jeopardize the long-term viability) of a local or regional population. Minute pocket moss is more likely to occur in cool shaded areas of native redwood habitat, which would largely be avoided by project design.

The proposed footprint of the new water tank is outside the coast redwood trees and the proposed project would only require the removal of five trees: one small, suppressed coast redwood and four tanbark oak trees. Dead trees, branches, and secondary trunks would also be removed from the existing grove to improve grove health. The project would also involve post-construction revegetation of the site with five fruit and nut trees and three blackberry bushes. As such, loss of a small amount of minute pocket moss, if present in the areas proposed for clearing, is not likely to represent a significant proportion of the regional or local population, and as such would not result in jeopardy to that population.

Impacts to Special Status Animals

Nine special status animals have potential to occur within the project work areas. Of these, one is the federally threatened and state endangered marbled murrelet (*Brachyramphus marmoratus*) and one is a state candidate for listing as threatened western bumble bee (*Bombus occidentalis*) (Appendix B). The remaining seven species include two amphibians: Santa Cruz Black Salamander (*Aneides flavipunctatus niger*) and California giant salamander (*Dicamptodon ensatus*); two birds: Cooper's hawk (*Accipiter cooperii*) and white-tailed kite (*Elanus leucurus*); and three mammals: pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*) and hoary bat (*Lasiurus cinereus*).

Marbled Murrelet

Marbled murrelet is not expected to nest within the project area due to a lack of suitable old-growth redwood breeding/nesting habitat. Individuals may transiently occur within the vicinity (flyover). Vegetation removed from the project site will predominantly include small trees or shrubs, not old growth redwoods; therefore, no impact to nesting marbled murrelet is anticipated.

Western Bumble Bee

Potential impacts to western bumble bee include injury or mortality if individuals or colonies are present within the project area during construction. With implementation of Mitigation Measures BIO-1 and -3 impacts would be mitigated to a less-than-significant level.

Special Status Birds

White tailed kite and Cooper's hawk have a low potential to inhabit and nest within the proposed work areas due to the presence of suitable nest trees, however the level of human presence and development in the understory is likely a deterrent. Because no suitable nest trees are proposed for removal, raptor nests, if present in or near the work area would not be damaged or destroyed; however, construction activity and noise could result in nest abandonment of these raptors, both of which would likely be highly sensitive to human activity near a nest. Nest abandonment and loss of nestlings would be considered a significant impact under CEQA but could be mitigated to a less-than-significant level through implementation of Mitigation Measures BIO-1 and -2.

Other Nesting Migratory Birds

Both projects sites have the potential to support nesting birds that are protected under the California Fish and Game Code (CFGC). Construction activity and noise that disrupts nesting behavior and damage or destruction of active nests within the work areas would be considered a violation of the CFGC. Implementation of Mitigation Measures BIO-1 and -2 would prevent violation of the CFGC.

Special Status Bats

Hoary bat, Townsend's big-eared bat and pallid bat all have a low potential to occur on site both during foraging and for roosting. Work would occur during daylight hours; however, impacts to individuals may occur through direct mortality if bats are roosting in trees when removed. Implementation of Mitigation Measures BIO-1 and -4 would reduce impacts to special status bats to a less-than-significant level.

California Giant Salamander and Santa Cruz Black Salamander

Both California giant salamander and Santa Cruz black salamander may occur in leaf litter or under rocks in moist upland habitat and both have a low potential to occur on paved roadways during dispersal. These species could be injured or killed by construction activity within natural areas, especially during clearing vegetation. Implementation of Mitigation Measures BIO-1 and -5 would reduce impacts to a less-than-significant level.

Mitigation Measures

The following mitigation measures would reduce impacts to candidate, sensitive, and special status species to a less-than-significant level.

BIO-1 Worker Environmental Awareness Program

All personnel associated with project construction shall attend a Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist, to aid workers in recognizing special status resources that may occur in the project area. The specifics of this program shall include identification of the special status species and habitats, a description of the regulatory status and general ecological characteristics of special status resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employers, and other personnel involved with construction of the project. All employees shall sign a

form provided by the trainer documenting they have attended the WEAP and understand the information presented to them. The form shall be submitted to SLVWD to document compliance.

BIO-2 Preconstruction Nesting Raptor and Bird Surveys and Avoidance

To avoid impacts to nesting bird species and raptors, all initial ground-disturbing activities and tree removal shall be limited to the time period between September 15 and February 1. If initial ground-disturbing activities and tree removal cannot be limited to this time period, the project contractor shall complete a pre-construction survey to determine if active nests are within the project area limits, or sufficiently close to project activity to be disturbed by construction activities. Surveys shall be conducted by a qualified biologist.

Construction activity shall be scheduled so that no more than 14 days elapse between the pre-construction survey and the commencement of any activity that would potentially disturb trees or shrubs in the nesting zone. Significant delays in project activity would necessitate a new pre-construction survey. The pre-construction survey should determine if birds are breeding and/or nesting in the construction zone or within 300 feet (500 feet for raptors) of the construction zone. Pre-construction nesting bird and raptor surveys shall be conducted during the time of day when birds are active and shall be of sufficient duration to reliably conclude presence/absence of nesting birds and raptors on site and within the designated vicinity.

If no nests are found, no further action is required. If nests are found, an avoidance buffer will be established by the qualified biologist. The size of the buffer shall be based upon the species, presence of screening vegetation, the proposed work activity, ambient levels of human activity, and existing disturbances associated with land uses outside of the site to ensure the nesting activity is not disrupted. The avoidance buffer shall be demarcated by the biologist with bright orange construction fencing, flagging, construction lathe, or other means to mark the boundary until the adults and young are no longer reliant on the nest site. The qualified biologist shall monitor construction activities that occur near active nest areas to ensure that no inadvertent adverse impacts affect the nest.

BIO-3 Western Bumble Bee Preconstruction Surveys and Avoidance

A qualified biologist(s) shall conduct a pre-construction survey within 14 days of the onset of work. The pre-construction survey effort shall be conducted for a minimum of one hour. The purpose of the survey is to identify and completely avoid individuals and colonies of western bumble bee. If bumble bees of any species are observed, they shall be photographed for identification following the USFWS guidance in Appendix A of *Standardized Bee Photography in the Survey Protocols for the Rusty Patched Bumble Bee* (*Bombus affinis*) (USFWS 2019). If construction begins between March 1st and November 1st, the ground shall also be searched during the survey for active bumble bee colonies. No capture or handling of bumble bees shall be conducted, and western bumble bee shall be avoided. Foraging bees shall be allowed to leave work areas undisturbed, and bee colonies shall be avoided during the active season from March 1 through November 1.

BIO-4 Special Status Bats Preconstruction Surveys and Avoidance

A preconstruction bat emergence survey shall be conducted no more than 14 days prior to the start of construction by a qualified biologist to determine if any trees designated for removal functions as a maternity or temporary roost. Emergence times may vary dependent on species, weather conditions, and time of year and should occur when conditions are favorable (higher temperatures,

high humidity, low wind, no precipitation), and timed to capture bat emergence (typically occurring between sunset and midnight).

Emergence surveys shall be conducted during the maternity season for bats (May 1 through August 31). During September, bats begin to enter their hibernaculum stage in preparation for colder months and may not emerge from their roosts, and emergence surveys would not be conclusive. If bats are identified roosting in trees to be removed, eviction measures can be implemented for non-maternity roosts. Install exclusion netting (specific for bats to prevent re-entry) or other suitable exclusion methods (as determined by a qualified biologist) at roost openings to allow bats to exit but prevent their re-entry into the roost. Nets or exclusion devices would have to be regularly checked to prevent wildlife entrapment. Exclusion devices should be left in place and monitored daily for seven days to confirm the exclusion is successful prior to tree removal. Tree removal should be monitored by a qualified bat biologist in case any further individual relocation is necessary. Removal of trees that have an identified maternity roost shall be scheduled outside the maternity season, and shall follow the procedures outlined above.

BIO-5 Preconstruction Amphibian Surveys and Avoidance

Immediately prior to initial ground disturbance and vegetation removal, a qualified biologist shall conduct a preconstruction clearance survey of the site for special status amphibians. If California giant salamander and/or Santa Cruz black salamander are observed on site, they shall be relocated to suitable habitat in the immediate vicinity by the qualified biologist. The following additional measures shall be implemented to reduce potential impacts:

- Vegetation disturbance shall be the minimum necessary to achieve the goals of the project.
- All trash shall be removed from the site daily and disposed of properly to avoid attracting potential predators to the site.
- No pets shall be permitted on site during project activities.
- All vehicles shall be in good working condition and free of leaks. All leaks shall be contained and cleaned up immediately to reduce the potential of soil/vegetation contamination.
- All hole and trenches shall be covered at the end of the day or ramped to avoid entrapment.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project 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 Wildlife or U.S. Fish and Wildlife Service?

Plant communities are considered sensitive biological resources if they have limited distributions, high wildlife value, include sensitive species, or are particularly susceptible to disturbance. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in the CNDDB. CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's revised (Faber-Langendoen et al. 2012) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Some alliances with the rank of 4 and 5 have also been included in the 2019 sensitive natural communities list under the CDFW revised ranking methodology (CDFW 2019a). Redwood forest is considered a sensitive natural community by CDFW with a rank of G3 S3. Additionally, redwood alliances with California bay laurel, Douglas fir, and tan oak are also considered sensitive; however, they do not have a global or state rank. While the canopy is dominated by coast redwood within the project area, the understory is largely dominated by non-native species. The size of the site situated within a residential area also

contributes to degradation of habitat value from fragmentation. Removal of five trees and placement of the tank within an area dominated by canary ivy would not alter the function of this community; therefore, impacts to sensitive natural communities would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project 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?

The project site is not located within or adjacent to any wetlands or waters and is contained entirely within upland areas. All construction activities would therefore occur in uplands. No impact to state or federally protected wetlands would occur.

NO IMPACT

d. Would the project 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?

The project site is regionally located within an area mapped as an Essential Connectivity Area (CDFW 2010); however, the site is surrounded by residential development and doesn't function as a specific or unique corridor for wildlife movement in the region. Construction would be temporary and the area of disturbance would be small, creating little disturbance for local wildlife movement. Once construction is complete, it would not result in permanent changes that would impair wildlife movement as compared to the existing conditions. Therefore, impacts to wildlife movement and the use of native wildlife nursery sites would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Project Design Features include measures to protect trees, including the required development of an impact assessment, tree protection plan, and arborist report. The Tree Resource Analysis/Construction Impact Assessment/Tree Protection Plan prepared for the project (Appendix A) identified and evaluated 51 trees on site. The report includes an analysis of impacts due to construction and provides Project Design Features to protect trees that are to remain. The five trees to be removed do not meet "Significant" tree requirements, as defined by Santa Cruz County Code Chapter 16.34 (James P. Allen and Associates, 2020). With implementation of Project Design Features incorporated to protect trees, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is not located within the jurisdiction of an adopted Habitat Conservation Plan, Natural Community Plan, or other approved local, regional, or state habitat conservation plan (CDFW 2019b). Thus, no impact would occur.

NO IMPACT

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5 Cultural Resources

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

This section is based on information provided in the Phase I cultural resources memorandum for the project (Rincon Consultants, Inc. 2020; Appendix C). The significance of cultural resources and impacts to those resources is determined by whether or not those resources can increase collective knowledge of the past. The primary determining factors are site content and degree of preservation. This analysis focuses on areas of ground disturbance. Because no ground disturbance is proposed within the off-site staging area, the analysis focuses on the project site itself.

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

The project would involve the construction of a new tank on a currently vacant parcel and the installation of a water pipeline in an existing roadway. No built environment resources are located in the project site. Therefore, there would be no impact to historical resources.

NO IMPACT

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

No archaeological resources were identified within the project site during the records search, Native American outreach, and pedestrian survey. Although no archaeological resources have been previously identified within the project site, there is potential for unknown, buried archaeological resources to be discovered during ground disturbing activities. Section 01560 Part 1.09 of the SLVWD's construction contractor specifications require the contractor to conform to the applicable requirements of the National Historic Preservation Act of 1966 as it relates to the preservation of cultural resources. If potential archaeological resources are discovered during subsurface excavations at the construction sites, SLVWD's construction contractor specifications require that the contractor halt construction operations at the location of the find and contact a qualified archaeologist to assess the value of the potential cultural resources.

In addition, as identified in the *Project Design Features*, standard best management practices would be implemented during project construction measures in case of unanticipated discovery of cultural resources during project development. Impacts to archaeological resources would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

While the project site is unlikely to contain human remains, the potential for the recovery of human remains is always a possibility during ground disturbing activities. However, based on the disturbed nature of the project site and the lack of any identified cultural resources within the study area, the potential to encounter human remains is considered low. However, the discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the Coroner will notify the California Native American Heritage Commission (NAHC), which will determine and notify a most likely descendant (MLD). The MLD shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site.

Impacts to human remains would be less than significant.

LESS THAN SIGNIFICANT IMPACT

6 Energy

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Result in a 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?	☐	☐	☐	■

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Energy use during project construction would be primarily in the form of fuel consumption to operate heavy equipment, light-duty vehicles, machinery, and generators. Energy use during construction would be temporary in nature, and construction equipment used would be typical of similar-sized construction projects in the region. Furthermore, in the interest of cost efficiency, construction contractors would not utilize fuel in a manner that is wasteful or unnecessary. Therefore, project construction would not result in a potential impact due to wasteful, inefficient, or unnecessary consumption of energy resources, and no construction-related energy impact would occur.

During operation, the proposed project would require approximately 22 MWh of electricity per year to power the pump station. Electricity demands would be met by Pacific Gas & Electric (PG&E). Operation and maintenance activities would be conducted by SLVWD employees, and would require approximately one trip per month to the project site. However, electricity and fuel consumption would not be wasteful, inefficient, or unnecessary because maintenance activities would only occur as necessary for facility operation. Therefore, no operational energy impacts would occur.

NO IMPACT

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

SLVWD has not adopted specific renewable energy or energy efficiency plans with which the project could comply. Adopted on September 10, 2018, California Senate Bill (SB) 100 accelerates the State's Renewables Portfolio Standards Program by requiring electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045. Because the proposed project would be powered by the existing electricity grid, the project would eventually be powered by renewable energy mandated by

SB 100 and would not conflict with this statewide plan. The project would not conflict with or obstruct the state plan for renewable energy; therefore, no impact would occur.

NO IMPACT

7 Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. 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?	☐	☐	■	☐
2. Strong seismic ground shaking?	☐	☐	■	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
4. Landslides?	☐	☐	■	☐
a. Result in substantial soil erosion or the loss of topsoil?	☐	■	☐	☐
b. 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?	☐	☐	■	☐
c. Be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	■	☐	☐
d. 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?	☐	☐	☐	■
e. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	■

Santa Cruz County is located in the Coast Ranges physiographic province of California, which is characterized by a series of low mountain ranges, coastal terraces, alluvial valleys, and steep foothills. The northwest-southeast structural grain of the Coast Ranges is controlled by a complex of active faults within the San Andreas fault system. The Santa Cruz Mountains, within which the project site is located, are between the San Andreas strike-slip fault system to the northeast and the San Gregorio-Nacimiento strike-slip fault system to the southwest. The three major active faults in the region are the Zayante-Vergeles Fault, the San Andreas Fault, and the San Gregorio Fault, all of which are associated with Holocene activity (movement in the last 11,000 years; City of Santa Cruz 2011).

In August 2019, a geotechnical investigation was prepared for the proposed project by Haro, Kasunich, and Associates, Inc (Appendix D). The purpose of the investigation was to evaluate the soil and bedrock conditions at the site and develop geotechnical design criteria and recommendations for the proposed water tank foundation. Based on the results of the subsurface exploration, the project site is underlain by compressible firm sandy silt topsoil and lean clay from the surface to depths of approximately 2.5 feet. Below the topsoil, stiff to very stiff sandy silty lean clay was found to a depth of up to 20 feet. Stiff weathered siltstone and hard siltstone was encountered below that. The site is mapped as Tm: Monterey Formation (middle Miocene) - Medium to thick-bedded and laminated olive-gray to light gray semi-siliceous organic mudstone and sandy siltstone (Haro, Kasunich, and Associates, Inc. 2019).

a.1. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving 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?

a.2. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

The project site is located in a seismically active region of California and the region is considered to be subject to very intense shaking during a seismic event. The active San Andreas Fault Zone and the potentially active Zayante Fault Zone are located about 6.8 miles and 2.5 miles from the project site, respectively. The project site is not located in a Fault Zone (County of Santa Cruz 2020). According to the geotechnical investigation prepared for the proposed project, since no known faults cross the project site, the potential for surface ground rupture is low (Haro, Kasunich, and Associates, Inc. 2019).

Although the project site is located in a seismically active area, the project would not expose people to seismically induced risk. The proposed project involves construction of water storage infrastructure; the project would not involve any habitable structures. A large seismic event, such as a fault rupture, seismic shaking, or ground failure, could result in breakage of the proposed pipelines, failure of joints, and/or aboveground or underground leakage of water. In such an event, the infrastructure would be inspected and repaired as soon as possible. Additionally, the project would be required to comply with the California Building Standards Code (California Code of Regulations Title 24). The project has been designed to incorporate appropriate standard engineering practices and specifications to minimize risk of structural failure in a seismic event and reduce secondary impacts that may occur as a result. Design and construction of the project would also adhere to American Water Works Association Standards for protection from thrust and earth movement.

The project would be subject to seismic shaking. The project would not result in construction of any habitable structures, and thus would not expose people or habitable structures to seismic hazards. During a major earthquake there is potential for severe ground shaking at this site. However, the geotechnical investigation concluded that structures designed in accordance with the most current California Building Code ~~(2013 California Building Code)~~ should perform adequately during strong seismic shaking (Haro, Kasunich, and Associates, Inc. 2019). The proposed project would adhere to current California Building Code standards.

In summary, the proposed project would not involve development of habitable structures and is not located within an Alquist-Priolo Earthquake Fault Zone. Therefore, the project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault or seismic-related ground failure, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.3. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

a.4. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

c. Would the project 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?

Potential seismic hazards include liquefaction and damage from strong seismic shaking. Because of the stiff to very stiff consistency of the weathered siltstone, clayey siltstone, and hard siltstone underlying the project site, the geotechnical investigation concluded the potential for seismic-induced liquefaction is low. During the geotechnical field investigation and site reconnaissance, no visual indications of slope instability were observed on the project site. In addition, conditions encountered in site borings did not indicate potential instability (Haro, Kasunich, and Associates, Inc. 2019).

The geotechnical investigation did indicate the project site is located in an area mapped as a large probable landslide deposit of about 450 acres in size as shown on the "Preliminary Map of Landslide Deposits in Santa Cruz County," which encompasses hundreds of occupied parcels. The geotechnical investigation indicates that a geologic report for another property within the suspected landslide deposit noted the deposit was not mapped on a regional geologic map and in an examination of stereo aerial photographs, concluded there was no evidence in the aerial photographs to support the existence of the landslide, notably the absence of a landslide headscarp (Haro, Kasunich, and Associates, Inc. 2019).

As indicated in items a.1 and a.2, because no known faults cross the project site, the potential for surface ground rupture is low. The most current California Building Code edition design considerations, specifically the seismic factors and coefficients from Chapter 16, Volume II, would be followed during design and construction of the projects. None of the project components would destabilize the terrain in a manner that would increase the risk of liquefaction or landslides.

Trenching for the proposed pipeline would be limited to a maximum depth of four feet, and construction activities would include the lining and appropriate backfilling of trenches to minimize potential effects associated with subsidence. In addition, Sections 01540 and 02221 of the SLVWD

construction contractor specifications require contractors to submit and implement a detailed plan that includes sheeting, shoring, bracing, or other excavation supports to prevent caving of the trenches.

Therefore, the project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, liquefaction, or landslides, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

According to the 1980 Soil Conservation Survey of Santa Cruz County (United States Department of Agriculture), the hazard of erosion is very high for the soils on the project site and surrounding area (Nisene-Aptos Complex-158). The project geotechnical report also indicates that soils at the project site have potential for erosion where unvegetated (Haro, Kasunich, and Associates, Inc. 2019).

The proposed project would require excavation and grading activities on the project site. Grading and excavation could result in soil erosion if not properly managed. Therefore, the proposed project's erosion impacts would be potentially significant. Mitigation Measure GEO-1 would require implementation of the recommendations identified in the geotechnical investigation, which include the following erosion controls:

- All grading and soil disturbance shall be kept to a minimum.
- No eroded soil shall be allowed to leave the site.
- All bare soil should be seeded and mulched immediately after grading with barley, rye, grass and crimson clover and covered with straw.
- Prior to the rainy season bare soil on cut or fill slopes shall be well vegetated or protected from erosion by installation of ground cover or properly installed erosion control blankets

Implementation of Mitigation Measure GEO-1 would reduce impacts to a less than significant level.

GEO-1 Geotechnical Investigation Recommendations

The project contractor shall implement the recommendations identified in the geotechnical investigation prepared for the proposed project by Haro, Kasunich, and Associates, Inc. in August 2019.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Based on the geotechnical investigation's subsurface exploration and testing, the near surface soil at the tank site consists of firm to stiff sandy silt and lean clay topsoil, stiff to very stiff weathered siltstone, and clayey siltstone of variable strength. Test results indicate the soil contains 80 percent fines (clay and silt). The fine-grained soils are moderately expansive, difficult to compact, and unsuitable for use as structural fill (Haro, Kasunich, and Associates, Inc. 2019). Therefore, this impact is potentially significant.

Mitigation Measure GEO-1 requires implementation of all recommendations from the geotechnical investigation. To provide uniform support for the proposed water tank, the geotechnical

investigation recommends the top three feet of soil at the site be sub-excavated, removed from the site, and replaced with select non-expansive engineered fill (Haro, Kasunich, and Associates, Inc. 2019). Implementation of geotechnical recommendations would minimize risks associated with expansive soils. This impact would be less than significant with mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

e. Would the project 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?

The proposed project would not require sanitary sewer service and would not use septic systems. No impact would occur.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No unique geologic features have been identified in plans or observed on the site. The site is not identified as having paleontological resources in the County's GIS mapping system (Santa Cruz County Planning Department 2020). The depth of grading and area of disturbance for the proposed project would be minimal. Thus, the project would have no impact on paleontological resources.

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8 Greenhouse Gas Emissions

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

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey there are other changes in addition to rising temperatures. The baseline to which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC), the understanding of anthropogenic (human caused) warming and cooling influences on climate has led to a high confidence (95 percent or greater chance) that the global average net effect of human activities has been the dominant cause of warming since the mid-twentieth century (IPCC 2007).

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases such as hydrofluorocarbons (HFC) and perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills.

Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (California Environmental Protection Agency [CalEPA] 2006). Different

types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. CO_2 has a 100-year GWP of one. By contrast, CH_4 has a GWP of 25, meaning its global warming effect is 25 times greater than CO_2 on a molecule per molecule basis (IPCC 2007).

The accumulation of GHGs in the atmosphere regulates Earth's temperature. Without the natural heat-trapping effect of GHGs, Earth's surface would be about 34 degrees Celsius cooler (CalEPA 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The primary GHGs of concern include CO_2, CH_4, N_2O, and fluorinated gases (HFCs, PFCs), and SF_6. These all contribute to climate change on a global scale and climate change affects numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns.

Individual projects would generate GHG emissions through the burning of fossil fuels and/or other means, thus potentially contributing to cumulative impacts related to climate change. In response to an increase in human-made GHG concentrations over the past 150 years, California implemented Assembly Bill (AB) 32, the "California Global Warming Solutions Act of 2006." AB 32 codifies the Statewide goal of reducing emissions to 1990 levels by 2020 (essentially a 15 percent reduction below 2005 emission levels) and the adoption of regulations to require reporting and verification of statewide GHG emissions. Furthermore, on September 8, 2016, the governor signed Senate Bill (SB) 32 into law, which requires the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030. SB 32 extends AB 32, directing CARB to ensure that GHG emissions are reduced to 40 percent below the 1990 level by 2030.

On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally-appropriate quantitative thresholds consistent with a Statewide per capita goal of 6 metric tons (MT) of CO_2e by 2030 and 2 MT of CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the State.

The majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines Section 15064[h][1]).

In 2013, the County of Santa Cruz adopted a Climate Action Strategy (CAS) to establish goals and policies that incorporate sustainability and GHG reduction into its management processes. The first step in completing the CAS was to complete a GHG emissions inventory. The County of Santa Cruz's 2009 inventory amounted to 791,278 MT of CO_2e community-wide and 34,267 MT of CO_2e from municipal operations. As of 2013, the County had already achieved the State's AB 32 goal of reducing GHG emissions to below 1990 levels by 2020 because of the cessation of manufacturing at

the Davenport Cement Plant. Therefore, the County of Santa Cruz has set a goal to reduce emissions to 18 percent below 2009 levels by 2020, 30 percent below 2009 levels by 2035, and 59 percent below 2009 levels by 2050 (County of Santa Cruz 2013).

Neither MBARD nor SLVWD have adopted GHG emissions thresholds. MBARD is currently in the process of developing GHG emissions thresholds for evaluating projects under CEQA. Where MBARD is the lead agency, it has adopted a threshold of 10,000 MT of CO_2e per year for stationary source projects or compliance with an adopted GHG Reduction Plan/Climate Action Plan (MBARD 2016). However, MBARD does not have formally adopted thresholds for projects where it is not the lead agency.

As identified in Section 15064.7(c) of the CEQA Guidelines, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence. In April 2012, the San Luis Obispo County Air Pollution Control District (SLOAPCD), whose jurisdiction is adjacent to MBARD's jurisdiction to the south, adopted quantitative thresholds for GHG emissions for most land use projects (SLOAPCD 2012). The SLOAPCD *CEQA Handbook* includes a bright-line threshold of 1,150 MT of CO_2e, as well as an efficiency threshold of 4.9 MT of CO_2e per service population per year (service population is the total residents and employees accommodated by a project). The analysis herein uses the bright-line threshold of 1,150 MT CO_2e.

a. Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction emissions are confined to a relatively short period of time in relation to the overall life of the proposed project because the total construction period would only last approximately 12 months. Construction-related GHG emissions were estimated to be equivalent to those calculated for the SLVWD's Swim Tank Project (SLVWD 2018). Air districts such as the South Coast Air Quality Management District (SCAQMD) have recommended amortizing construction-related emissions over a 30-year period in conjunction with a project's operational emissions (SCAQMD 2008). In accordance with the SCAQMD's recommendation, estimated GHG emissions from project construction were amortized over a 30-year period and added to annual operational emissions to determine the proposed project's total annual GHG emissions. As shown in Table 3, construction activities are estimated to generate approximately 215 MT of CO_2e, which amortized over 30 years is approximately 7 MT of CO_2e per year.

As discussed in Section 6, *Energy,* operation of the proposed project would require approximately 22 MWh of electricity per year to power the pump station. The pump station would tie into the local electrical grid, and electricity demands would be met by PG&E. In 2017, the most recent year for which verified data is available, PG&E reported an energy intensity factor of 210 pounds of CO_2e per MWh of electricity delivered (PG&E 2019). Consequently, electricity demands associated with operation of the pump station would generate approximately 4,620 pounds, or approximately 2 MT of CO_2e per year. Operational maintenance trips would generate negligible GHG emissions.

Table 3 summarizes the construction and operational GHG emissions associated with the proposed project.

Table 3 Estimated Project GHG Emissions

Year	Emissions (CO_2e)
Total Construction Emissions[1]	215 MT
Amortized Construction Emissions (over 30 years)	7 MT/year
Total Annual Operational Emissions	2 MT/year
Total Annual Emissions	**9 MT/year**
SLOAPCD Recommended Threshold	1,150 MT/year
Exceed Threshold?	No

[1]Construction-generated GHG emissions were estimated to be equivalent to those calculated for the SLVWD Swim Tank Project.
Source: SLVWD 2018

As shown in Table 3, GHG emissions associated with construction and operation of the proposed project would not exceed the SLOAPCD recommended threshold of 1,150 MT per year. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The County of Santa Cruz (2013) CAS establishes GHG reduction strategies to be incorporated at the county level. Strategy E-8 calls for a reduction of energy use for water supply through water conservation measures, including adoption of a water conservation ordinance, adoption of a water-efficient landscape ordinance, and promotion of residential greywater irrigation systems. The proposed project would upgrade existing aging infrastructure and reduce the potential for water loss due to leaking pipes, thereby supporting Strategy E-8 of the CAS. Although the proposed project would increase the existing water system's storage capacity, the purpose of this project is to serve existing demand, accommodate projected growth, and improve performance reliability rather than to serve new growth. The proposed project is therefore consistent with the CAS. The project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. No impact would occur.

NO IMPACT

9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	■	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	■	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	☐	☐	☐	■
d. Be located on a site that is included on a list of hazardous material 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 in 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?	☐	☐	■	☐

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b. Would the project 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?

Construction of the proposed project would temporarily increase the transport and use of hazardous materials in the area during the use of construction vehicles and equipment. Limited quantities of miscellaneous hazardous substances, such as diesel fuel, oil, solvents, and other similar materials, would be transported to the project site, used, and stored during the construction period. These materials would be disposed of off-site in accordance with all applicable laws pertaining to the handling and disposal of hazardous waste. In addition, ground-disturbing activities could cause an accidental upset or accident condition of hazardous materials in use during construction. If such conditions cause a release of hazardous materials into the environment, potential impacts could occur. However, Section 01010 Part 1.07, Section 01060 Part 1.08, and Section 01560 Part 1.07 of the SLVWD construction contractor specifications state that the contractor must comply with the following procedures regarding hazardous materials, which would reduce hazardous materials impacts to a less than significant level:

- Properly store all volatile and hazardous wastes in covered metal containers and remove these wastes daily in accordance with all applicable disposal regulations, local ordinances, and anti-pollution laws.
- Store hazardous materials in covered, leak-proof containers when not in use, away from storm drains and heavy traffic areas, and in areas protected from rainfall infiltration.
- Store hazardous materials on a surface that prevents spills from permeating the ground surface and in an area secure from unauthorized entry at all times.
- Collect, remove, and legally dispose of waste oil, used oil filters, other waste petroleum materials, and any other hazardous waste generated by the contractor at suitable disposal facilities off-site.
- Construct on-site temporary fuel storage facilities to comply with current regulations. Ensure that fuel storage facilities are diked to contain any fuel spills and are properly grounded.
- Provide oil drip pans to contain any oil leakage from construction vehicles.

In the unlikely event that unanticipated, existing soil or groundwater contamination is discovered during construction of the proposed project, SLVWD has set forth construction contractor specifications that require appropriate treatment, handling, and notification of unanticipated hazardous environmental conditions. Article 4 of the *General Conditions* of the SLVWD construction contractor specifications states that if the construction contractor encounters a hazardous environmental condition, the construction contractor shall immediately secure or otherwise isolate such condition, stop all work in connection with such condition and in any area affected thereby, and notify SLVWD and the District Engineer of the hazardous environmental condition. The construction contractor shall not be required to resume work in connection with such condition or in any affected area until after SLVWD has obtained any required permits related thereto and delivered written notice to the construction contractor specifying that such condition and any affected area is or has been rendered safe for the resumption of work and specifying any special conditions under which such work may be resumed safely.

Project construction activities would comply with all applicable regulations, including the enforcement of hazardous materials treatment, handling, notification, and transportation regulations and implementation of best management practices (BMPs) as required by the SLVWD construction contractor specifications. As such, hazardous materials impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

Neither the ~~The~~ project site nor the off-site staging area are ~~is not~~ located within 0.25 mile of an existing or proposed school. The closest school is St. Andrews Preschool, located approximately 0.5 mile to the northeast of the project site. No impact would occur.

NO IMPACT

d. Would the project be located on a site that is included on a list of hazardous material 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?

Government Code Section 65962.5 requires the CalEPA to develop an updated Cortese List. The California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. The analysis for this section included a review of the following resources on June 1, 2020 to provide hazardous material release information:

- State Water Resources Control Board GeoTracker database
- DTSC EnviroStor database

There are no known hazardous materials sites located on the project site or off-site staging area, or within 0.5 mile from the project site or off-site staging area. No impact would occur.

NO IMPACT

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?

The proposed project is not located within an airport land use plan or within two miles of a public airport or public use airport. No impact would occur.

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The County of Santa Cruz published a draft Operational Area Emergency Management Plan that establishes a comprehensive, all-hazards approach to incident management for activities including prevention, preparedness, response, and recovery. The Operational Area Emergency Management Plan primarily focuses on organizational structure and chain of command and does not include policies specific to the project site (County of Santa Cruz 2015); therefore, this analysis focuses on the proposed project's potential to generally interfere with emergency response activities in the project vicinity.

Construction of the proposed project may require a temporary road closure on the 400 LF segment of Country Club Drive between Dundee Avenue and Scenic Way to accommodate trenching and pipeline installation activities. Emergency responders would still be able to access this road and the surrounding roadways ~~via Dundee Avenue and Scenic Way~~ throughout the construction period. As discussed in Section 17, *Transportation*, emergency services (e.g., medical, fire, police) would have coordinated access to Country Club Drive and surrounding streets throughout the construction period. In emergency access or evacuation scenarios, steel plates placed alongside active trenches would quickly be used to restore vehicle access in the roadway. All local service providers (including emergency personnel) would be contacted before roadway construction begins to schedule services around daily roadway openings and establish communication protocols with SLVWD for accommodating unscheduled access needs.

Project operation would not interfere with emergency response because the pipeline would be located entirely underground, and the aboveground infrastructure would not impede access in emergency response scenarios. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The project site is not located in a High Fire Hazard Area. According to the California Department of Forestry and Fire Protection (2007), the project site is located in the Moderate Fire Hazard Severity Zone in the State Responsibility Area. The proposed project is also not located in a Fire Hazard Area as designated by the County of Santa Cruz (2020). Furthermore, the project would not involve the construction of habitable structures. Thus, the project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

10 Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
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 which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	■	☐
(iv) Impede or redirect flood flows?	☐	☐	☐	■
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	■
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	■

The project site is currently undeveloped and vegetated. The west third of the parcel slopes to the east at a gradient of approximately 35 percent. Within the proposed location of the tank, the site slopes toward Dundee Avenue to the east at gradients of 20 to five percent. On the east side of the parcel, a three-foot cut slope descends to Dundee Avenue (Haro, Kasunich, and Associates, Inc. 2019). The pipeline alignment is an existing paved roadway.

The Water Quality Control Plan for the Central Coastal Basin (Basin Plan) designates beneficial uses and water quality objectives for waters of the State in the Central Coast Region, including surface waters and groundwater (Central Coast Regional Water Quality Control Board [RWQCB] 2019).

The project site overlies the Santa Margarita Groundwater Basin. Average groundwater recharge in this area is high because of high aquifer transmissivity, high average rainfall, and sandy soils with low runoff, low evapotranspiration and high infiltration capacity (SLVWD 2016). Due to overdraft conditions in the early 20th century, the basin was adjudicated in 1966 and has been managed under an AB 3030 Groundwater Management Plan since 1994 (Santa Margarita Groundwater Sustainability Agency 2020). The basin is currently managed by the Santa Margarita Groundwater Sustainability Agency.

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Excavation, grading, and construction activities associated with construction of the proposed project would result in soil disturbance. As stormwater flows over a construction site, it can pick up sediment, debris, and chemicals, and transport them to receiving water bodies.

Because the proposed project would disturb less than one acre, the project would not be subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Chapter 16.20 (Grading Ordinance) of the Santa Cruz County Municipal Code requires all grading permit applications to include an erosion control plan for all surfaces to be exposed during construction. Chapter 16.22 (Erosion Control Ordinance) requires erosion and sediment controls and mechanisms for enforcement.

In addition, Section 01560 Part 1.08 of the SLVWD construction contractor specifications require contractors to implement effective wind erosion control measures and to provide effective soil cover for inactive areas and all finished slopes, open space, utility backfill, and completed areas. Contractors must also establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site. Furthermore, contractors must effectively manage all run-on from off the site, all runoff within the site, and all runoff that discharges off the site. Run-on from off the site must be directed away from all disturbed areas. Project operation would not involve new discharges that would violate any water quality standards or waste discharge requirements.

Project design would adhere to the *Design Criteria Containing Standards for the Construction of Streets, Storm Drains, Sanitary Sewers, Water Systems, Driveways Within the Unincorporated Portion of Santa Cruz County* (County of Santa Cruz 2019). The proposed project would constitute a "medium" project for the purposes of the County's design criteria, as it would add between 500 and 5,000 square feet of impervious surface area. Medium projects are exempt from specific quantitative requirements if there is adequate on- and off-site drainage with no known downstream restrictions. The County's design criteria contain qualitative site design and runoff reduction strategies and BMPs for medium projects, including directing surface runoff away from building foundations and footings, minimizing impervious surfaces, and limiting clearing and grading of

native vegetation at the site to the minimum area needed to implement the project (County of Santa Cruz 2019).

Implementation of Mitigation Measure GEO-1 would further reduce erosion-related impacts to water quality by requiring implementation of erosion controls and other BMPs recommended in the geotechnical investigation.

This impact would be less than significant with Mitigation Measure GEO-1 incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Excavation would be up to a maximum of four feet in depth. Groundwater is not likely to be encountered at a depth of four feet and no dewatering activities would occur. Therefore, project construction would have no impact on groundwater supplies.

SLVWD currently has eight active groundwater wells that constitute a substantial portion of the SLVWD water supply. In 2015, groundwater supplied 56 percent of the SLVWD total water supply with 994 acre-feet of groundwater extracted. SLVWD forecasts that groundwater extraction will decrease to 906 acre-feet per year by 2035 and will constitute approximately 41 percent of the total water supply at that time (SLVWD 2016). As a result, although the proposed project would increase potable water system storage capacity, the project would not deplete groundwater supplies because SLVWD intends to reduce total groundwater extraction in favor of other water supply sources in the future.

Furthermore, according to County of Santa Cruz GIS data, the project site is not located in a groundwater recharge area (County of Santa Cruz 2020). Therefore, the project would not significantly reduce the amount of groundwater recharge that is potentially occurring on the project site. Impacts to groundwater resources would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c.(i) Would the project 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 result in substantial erosion or siltation on- or off-site?

Upon completion of construction, the pipeline alignment would be restored to its original condition, and any drainage pattern would be the same as it was prior to project construction activities. However, project implementation would alter the existing drainage pattern of the water tank site through the addition of impervious surfaces, including the water tank roof, pump station roof, and paved driveway surface. Per the recommendations in the geotechnical investigation, as required by Mitigation Measure GEO-1, concentrated surface runoff from the project site would not be allowed to flow onto the slopes below the tank site so as to protect against soil erosion. Instead, roof and surface runoff would be directed away from foundations via buried plastic pipes and conveyed to the paved road downslope of the project site.

Consequently, the proposed project would not result in substantial erosion or siltation on or off site. This impact would be less than significant with incorporation of Mitigation Measure GEO-1.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c.(ii) Would the project 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

c.(iii) Would the project 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 that would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The project would alter the existing drainage pattern of the water tank site through the addition of impervious surfaces. The majority of the project site would remain unpaved and vegetated.

As discussed under item a, project design would adhere to the *Design Criteria Containing Standards for the Construction of Streets, Storm Drains, Sanitary Sewers, Water Systems, Driveways Within the Unincorporated Portion of Santa Cruz County* (County of Santa Cruz 2019). The County's design criteria contain qualitative site design and runoff reduction strategies and BMPs for medium projects, including directing surface runoff away from building foundations and footings, minimizing impervious surfaces, and limiting clearing and grading of native vegetation at the site to the minimum area needed to implement the project (County of Santa Cruz 2019). Compliance with the County's design criteria would control surface runoff and prevent it from resulting in flooding both on or off site or exceeding the capacity of existing or planned stormwater drainage systems.

In addition, stormwater runoff from the project site would not be polluted because the site would not store or contain pollutants. Due to the small surface area affected by the proposed project, no alterations to a stream or river would occur.

This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c.(iv) Would the project 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 impede or redirect flood flows?

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

According to the Federal Emergency Management Agency (FEMA), the project site is located in Zone X, which denotes areas of minimal flood hazard (FEMA 2012). The site is not located near a large body of water, and is therefore not subject to inundation by tsunami or seiche.

Consequently, no impact related to flood flows or project inundation would occur.

NO IMPACT

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

As discussed under items a and b, the project would have no adverse impacts related to water quality objectives or groundwater supplies.

The proposed project would not conflict with the adjudication established for the Santa Margarita Groundwater Basin, which protects the long-term sustainability of the groundwater basin. In addition, the proposed project would not conflict with the Basin Plan.

As such, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. No impact would occur.

NO IMPACT

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11 Land Use and Planning

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
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?	☐	☐	☐	■

a. Would the project physically divide an established community?

The proposed project would construct water storage and conveyance infrastructure near existing water facilities. Upon completion of construction, the pipeline would be located underground, and the water storage tank and pump station would not impede access on Dundee Avenue or Country Club Drive. The project would not divide an established community.

NO IMPACT

b. Would the project 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?

The proposed project would construct a new steel-bolted water storage tank, which would replace capacity lost by retiring the two aging, leaking redwood storage tanks at the Swim Tank site. The Parks, Recreation, and Public Facilities Element of the County of Santa Cruz General Plan/Local Coastal Program includes the following objectives and policies related to water systems and water conservation (County of Santa Cruz 1994):

> **Objective 7.18a. Domestic Water Service.** To ensure a dependable supply of high-quality domestic water to meet the needs of communities that obtain water service from municipal water systems, County water districts and small water systems.
>
> **Objective 7.18c. Water Conservation.** To maximize the County's water conservation potential through a coordinated program with water purveyors and water management agencies involving public education, financial incentives to conserve, voluntary and mandatory conservation measures, retrofit programs, run-off management and water waste regulations and enforcement.
>
> > **Policy 7.18.4. Improvement of Water Systems**. Support water system improvement programs for storage, treatment and distribution facilities to meet necessary water supply and fire suppression requirements.

> **Policy 7.18.6. Water Conservation Requirements.** Utilize the best available methods for water conservation in new developments. Work with all water purveyors to implement demand management programs and water conservation measures. In areas where shortage or groundwater overdraft has been substantiated by the water purveyor, require water conservation measures for new and existing uses. Require the use of water-saving devices such as ultra-low-flow fixtures and native drought-resistant planting in new development projects to promote ongoing water conservation.

The proposed project would improve water infrastructure in SLVWD's service area, thereby increasing the reliability of local water supplies. The project would therefore support the County's objective to implement water storage projects to meet water supply and fire suppression requirements. The new steel-bolted storage tank would be an improvement against the existing leaking redwood storage tanks, which would limit water loss due to leaks and support the County's water conservation objectives. Furthermore, the land use and zoning designation for the project site allow for construction of water infrastructure. Therefore, the proposed project would not conflict with an applicable land use plan, policy, or regulation and is supported by policies in the County of Santa Cruz General Plan/Local Coastal Program. No impact would occur.

NO IMPACT

12 Mineral Resources

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

a. Would the project 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. Would the project 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?

The proposed project is located in a rural, forested area. The site is not designated for mineral extraction in the County's General Plan and is not located within, adjacent to or near existing mining operations or known mineral resources (Santa Cruz County 1994). According to the County's GIS data (2020), the project site is not located in a mineral resource zone. No impact would occur.

NO IMPACT

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13 Noise

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in:				
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?	☐	☐	☐	■

Noise Overview

The unit of measurement used to describe a noise level is the decibel (dB). However, the human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, a method called "A weighting" is used to filter noise frequencies that are not audible to the human ear. A-weighting approximates the frequency response of the average young ear when listening to most ordinary everyday sounds. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the "A-weighted" levels of those sounds. Therefore, the A-weighted noise scale is used for measurements and standards involving the human perception of noise. In this analysis, all noise levels are A-weighted, and "dBA" is understood to identify the A-weighted decibel.

Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. A 10 dB increase represents a 10-fold increase in sound intensity, a 20 dB change is a 100-fold difference, 30 dB is a 1,000-fold increase, etc. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two equivalent noise sources combined do not sound twice as loud as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease; that a change of 5 dBA is readily

perceptible; and that an increase (decrease) of 10 dBA sounds twice (half) as loud (California Department of Transportation [Caltrans] 2013).

Descriptors

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this analysis are the one-hour equivalent noise level (L_{eq}) and the community noise equivalent level (CNEL).

- The L_{eq} is the level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound. For example, $L_{eq(1h)}$ is the equivalent noise level over a 1-hour period and $L_{eq(8h)}$ is the equivalent noise level over an 8-hour period. $L_{eq(1h)}$ is a common metric for limiting nuisance noise whereas $L_{eq(8h)}$ is a common metric for evaluating construction noise.
- The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dBA penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and an additional 10 dBA penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night.

Propagation

Sound from a small, localized source (approximating a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dBA for each doubling of the distance. Traffic noise is not a single, stationary point source of sound. Over some time interval, the movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point. The drop-off rate for a line source is 3 dBA for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dBA per doubling of distance.

Vibration Overview

Vibration levels are usually expressed as a single-number measure of vibration magnitude, in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second. Since it is related to the stresses that are experienced by buildings, PPV is often used in monitoring and controlling construction vibration. Although PPV is appropriate for evaluating the potential of building damage, it is not suitable for evaluating human response. It takes some time for the human body to respond to vibrations. In a sense, the human body responds to an average vibration amplitude (Federal Transit Administration [FTA] 2018). Because vibration waves are oscillatory, the net average of a vibration signal is zero. Thus, the root mean square (RMS) amplitude is used to describe the "smoothed" vibration amplitude (FTA 2018). The RMS of a signal is the square root of the average of the squared amplitude of the signal, usually measured in inches per second. The average is typically

calculated over a one-second period. The RMS amplitude is always less than the PPV and is always positive. Decibel notation is used to compress the range of numbers required to describe vibration. The abbreviation VdB is used in this analysis for vibration decibels to reduce the potential for confusion with sound decibels.

Continued vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hertz), or when foundations or utilities, such as sewer and water pipes, connect the structure and the vibration source.

Regulatory Setting and Significance Thresholds

Noise

California Code of Regulations §50391

Pursuant to Section 50391 of the California Code of Regulations, building and zoning ordinances do not apply to the "location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency."

County of Santa Cruz General Plan Public Safety and Noise Element

The Public Safety and Noise Element of the County of Santa Cruz GP/LCP contains the following policy that pertains to construction noise:

> **Policy 6.9.7. Construction Noise.** Require mitigation of construction noise as a condition of future project approvals.

Santa Cruz County Noise Ordinance

Chapter 8.30 of the Santa Cruz County Code states that no person shall make, cause, suffer, or permit to be made any offensive noise, which can include construction noise (County of Santa Cruz 2017d). According to Section 8.30.010(C)(1)(a), noise that occurs during daytime and evening hours (8:00 a.m. to 10:00 p.m.) is considered to be offensive if one or more of the following occurs:

- Noise is clearly discernable at a distance of 150 feet from the property line of the property from which the sound is broadcast
- Noise is in excess of 75 dBA at the property line of the property from which the sound is broadcast

According to Section 8.30.010(C)(2)(b) of the Santa Cruz County Code, noise that occurs during nighttime hours (10:00 p.m. to 8:00 a.m.) is considered offensive if one or more of the following occurs:

- Noise is made within 100 feet of a building regularly used for sleeping
- Noise is clearly discernable at 100 feet from the property line of the property from which the sound is broadcast
- Noise is in excess of 60 dBA at the property line from which the sound is broadcast

However, Section 8.30.010(C)(5) of the Santa Cruz County Code also states that the necessity of the noise shall be considered when determining if a violation of the noise ordinance exists and

specifically lists permitted construction activities as an example of necessary noise. In addition, Section 13.15.040 of the Santa Cruz County Code exempts noise sources normally and reasonably associated with construction, repair, remodeling, or grading from compliance with the noise planning requirements of Chapter 13.15 provided that a permit has been obtained from the County and such activities take place between 8:00 a.m. and 5:00 p.m. on weekdays with no construction on Saturdays, Sundays, or federal holidays unless advance authorization has been granted by the Building Official.

Vibration

The County of Santa Cruz has not adopted any thresholds for construction or operational groundborne vibration impacts. Vibration limits used in this analysis to determine a potential impact to local land uses are based on information contained in Caltrans' (2020) *Transportation and Construction Vibration Guidance Manual* and the FTA (2018) *Transit Noise and Vibration Impact Assessment Manual*. Maximum recommended vibration limits by the American Association of State Highway and Transportation Officials (AASHTO) are identified in Table 4.

Table 4 AASHTO Maximum Vibration Levels for Preventing Structural Damage

Type of Situation	Limiting Velocity (in/sec)
Historic sites or other critical locations	0.1
Residential buildings, plastered walls	0.2 - 0.3
Residential buildings in good repair with gypsum board walls	0.4 - 0.5
Engineered structures, without plaster	1.0 - 1.5

in/sec = inches per second
Source: Caltrans 2020

Based on AASHTO recommendations, limiting vibration levels to below 0.2 PPV inches per second at residential structures would prevent structural damage regardless of building construction type. These limits are applicable regardless of the frequency of the source. Therefore, 0.2 PPV is utilized as the threshold for assessing vibration impacts to structures.

However, as shown in Table 5 and Table 6, potential human annoyance associated with vibration is usually different if it is generated by a steady state or a transient vibration source.

Table 5 Human Response to Steady State Vibration

PPV (in/sec)	Human Response
3.6 (at 2 Hz)–0.4 (at 20 Hz)	Very disturbing
0.7 (at 2 Hz)–0.17 (at 20 Hz)	Disturbing
0.10	Strongly perceptible
0.035	Distinctly perceptible
0.012	Slightly perceptible

PPV = peak particle velocity; Hz = hertz
Source: Caltrans 2020

Table 6 Human Response to Transient Vibration

PPV (in/sec)	Human Response
2.0	Severe
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible

PPV = peak particle velocity; in/sec = inches per second

Source: Caltrans 2020

As shown in Table 5, the vibration level threshold at which steady vibration sources are considered to be distinctly perceptible is 0.035 inches per second PPV, which is roughly equivalent to the FTA criterion of 78 VdB for identifying impacts to residential land uses from infrequent events, such as passing trains. However, as shown in Table 6, the vibration level at which transient vibration sources (such as construction equipment) is considered to be distinctly perceptible is 0.24 inches per second PPV, which is roughly equivalent to 94 VdB. Therefore, for the purposes of this analysis, the distinctly perceptible vibration level of 94 VdB is utilized as a significance threshold for assessing vibration impacts. Although groundborne vibration is sometimes noticeable in outdoor environments, groundborne vibration is almost never annoying to people who are outdoors; therefore, vibration impacts are assessed at the occupied structures of affected properties (FTA 2018).

Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Some land uses are more sensitive to ambient noise levels than other uses due to the amount of noise exposure and the types of activities involved. The Noise Element of the County of Santa Cruz General Plan/Local Coastal Program considers residences, hospitals, and schools to be sensitive receivers (County of Santa Cruz 1994).

The predominant noise-sensitive land uses in the area of the project site are residences. The proposed tank site is bordered by Country Club Drive to the west and south, Dundee Avenue to the east, and a single-family residence directly adjacent to the north. The pipeline alignment is bordered by residences to the east and west along Country Club Drive. The residential noise-sensitive receiver closest to the project site is the residence located directly adjacent to the proposed water tank and pump station site to the north. The nearest noise-sensitive receiver to the proposed noise-generating equipment at the project site is the existing single-family residence located across Dundee Avenue to the west of the proposed water tank and pump station site.

Ambient Noise Levels

Quiet rural and suburban areas, similar to those adjacent to the project site, typically have noise levels in the range of 25 to 50 dBA (Caltrans 2020). The project site is located outside the existing and future 55 CNEL contour of SR 9 (County of Santa Cruz 1994).

a. Would the project result in 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?

Pursuant to Section 50391 of the California Code of Regulations, building and zoning ordinances do not apply to the "location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency." The proposed project involves the storage and transmission of potable water supplies, and is therefore exempt from local building and zoning ordinances, including the Santa Cruz County Noise Ordinance. Nevertheless, SLVWD as the lead agency has chosen to use the noise level limits in the Santa Cruz County Noise Ordinance as the thresholds of significance for the purposes of evaluating the project's operational impacts under CEQA in accordance with CEQA Guidelines Section 15064.7(c). ~~The analysis in this IS-MND quantifies the project's anticipated noise levels and compares them to the noise standards in the Santa Cruz County Noise Ordinance for informational purposes.~~

Construction Noise

Temporary noise levels caused by construction activity would be a function of the noise generated by construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of noise-generating activities.

For construction noise assessment, construction equipment can be considered to operate in two modes: stationary and mobile. As a rule, stationary equipment operates in a single location for one or more days at a time, with either fixed-power operation (e.g., pumps, generators, and compressors) or variable-power operation (e.g., pile drivers, rock drills, and pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion, such as bulldozers, graders, and loaders (FTA 2018). Noise impacts from stationary equipment are assessed from the center of the equipment, while noise impacts from mobile construction equipment are assessed from the center of the equipment activity area (e.g., construction site).

Section 13.15.040 of the Santa Cruz County Code exempts construction activities that occur between the hours of 8:00 a.m. to 5:00 p.m. on weekdays from compliance with the County's noise limits. ~~Per SCMC Section 11.44.080, noise generated by construction activities is exempt from compliance with the noise level limits contained in SCMC Section 11.44.040 if they occur between the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday and 8:00 a.m. to 6:00 p.m. on Saturday.~~ However, for purposes of analyzing impacts from this project, the FTA *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) criteria will be used. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA L_{eq} for an 8-hour period (FTA 2018).

Construction noise was estimated using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM). Typical construction projects have long-term noise averages that are lower than louder short-term noise events due to equipment moving from one point to another on the site, work breaks, and idle time. Additionally, due to the dynamic nature of a construction site, noise levels are calculated from the center of the activity. Thus, noise generated by water tank and pump station construction is evaluated from the center of the construction site. The distance between the center of the construction site for the water tank and pump station and the property line is approximately 50 feet. For modeling purposes, the three loudest pieces of equipment (a dozer, a grader, and an excavator) that would be used during the loudest phase of water tank and pump station construction (grading and site preparation) were modeled. The hourly noise level at

20 feet from the center of pump station construction area is calculated to be 84 dBA L_{eq}. In addition, Project Design Features included in the *Project Description* as require the installation of equipment shielding and mufflers to reduce construction noise. Installation of sound shielding and use of industrial grade mufflers have been proven to reduce noise levels by at least 15 dBA (Generator Source 2020). Implementation of these Project Design Features would reduce construction noise by approximately 15 dBA, which would result in maximum construction noise levels of approximately 69 dBA Leq at residential property lines near the construction site. Construction noise generated at this site would not exceed the 80 dBA Leq daytime noise threshold. In addition, this analysis conservatively assumes that a number of pieces of construction equipment would be operating simultaneously during each phase of construction, and that there would not be any obstructions to line-of-sight that would further attenuate construction noise. Furthermore, noise modeling conservatively assumed equipment would all be operated at the same time. Realistically, equipment use would likely be staggered. Staggered operation of equipment would further reduce construction related noise.

Unlike pump station construction, which would be centered at a single location, pipeline construction activities would be mobile and would be constantly moving in a linear path along the pipeline alignment. Construction equipment used for site preparation and excavation activities would travel throughout the work areas, which would be a minimum of 400 feet in length by approximately 20 feet in width. The nearest sensitive receptors would be the residences located approximately 25 feet from construction activities. The average distance of sensitive receivers from mobile equipment would be approximately 200 feet. For modeling purposes, the three loudest pieces of equipment (a concrete saw, an excavator, and a loader) that would be used during the loudest phase of pipeline construction (site preparation) were modeled. The average hourly noise level at edge of the pipeline construction area is calculated to reach a maximum hourly noise level equivalent of 72 dBA L_{eq}. Therefore, construction noise associated with pipeline construction would not exceed the 80 dBA L_{eq} daytime noise threshold.

Construction noise would be temporary in nature and limited to the 12-month construction period. Project Design Features would be implemented to minimize construction noise impacts on adjacent properties. Noise impacts associated with construction of the proposed project would be less than significant.

Operational Noise

Upon completion of construction, the only noise-generating equipment associated with regular use of the proposed project would be the water pumps housed in the on-site pump station. Pump station maintenance activities could also require intermittent testing of the emergency LPG generator. However, operation of the emergency LPG generator would be necessary to maintain system operations and water supply during times of traditional power failure. As such, operation would be due to extenuating circumstances and temporary in nature. Maintenance and testing of the emergency LPG generator would be short-term in duration and limited to daytime hours, reducing potential impacts to the nearest sensitive receivers. Given the temporary nature of noise associated with the emergency generators, neither operation nor testing of the generators would generate substantial temporary or permanent increases in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance.

Operation of the water pumps would generate noise within the pump station building that would be transmitted to the exterior of the building via the ventilation openings (louvers) in the façade of the structure. The pump station would be housed in a rectangular, cast-in-place concrete building;

therefore, noise transmittal from pump operation would be limited to the pump station louvers. Based on reference noise level measurements taken at existing water pump stations at other locations, pump stations with one to two water pumps generate noise levels ~~between~~ of approximately ~~41 to 51~~ 55 dBA L_{eq} at ~~15~~ five feet (Central Basin Municipal Water District 2019).[1] See Appendix E for reference noise data. ~~This analysis conservatively assumes the proposed water pump station would generate a maximum noise level of 51 dBA at 15 feet.~~

According to Section 8.30.010(C)(1)(a), noise that occurs during daytime and evening hours (8:00 a.m. to 10:00 p.m.) is considered to be offensive if noise is clearly discernable at a distance of 150 feet from the property line of the property from which the sound is broadcast, and/or if noise is in excess of 75 dBA at the property line of the property from which the sound is broadcast. As previously referenced, quiet rural and suburban areas, similar to those adjacent to the project site, typically have noise levels in the range of 25 to 50 dBA (Caltrans 2020).

The distance from the proposed noise-generating pump station to the property line is approximately 20 feet. At the property line, noise levels would be approximately ~~48~~ 43 dBA L_{eq}, and would not exceed the threshold of 75 dBA. At a distance of 150 feet from the property line (for a total of 200 feet from the noise-generating equipment), noise levels would be 23 dBA L_{eq}. Assuming conservatively that daytime ambient noise levels are 25 dBA L_{eq} in the project site vicinity, the project would increase ambient noise levels by approximately 2 dBA to 27 dBA L_{eq}. As discussed under *Noise Overview*, the average healthy ear can barely perceive changes of 3 dBA. Therefore, project-related noise would not be discernable above daytime ambient noise levels. Consequently, operation of the pump station would not exceed daytime and evening noise standards.

According to Section 8.30.010(C)(2)(b) of the Santa Cruz County Code, noise that occurs during nighttime hours (10:00 p.m. to 8:00 a.m.) is considered offensive if noise is made within 100 feet of a building regularly used for sleeping, if noise is clearly discernable at 100 feet from the property line of the property from which the sound is broadcast, and/or if noise is in excess of 60 dBA at the property line from which the sound is broadcast. As discussed above, at the property line, noise levels would be approximately ~~48~~ 43 dBA L_{eq}, and would not exceed the threshold of 60 dBA. At a distance of 100 feet from the property line (for a total of 150 feet from the noise-generating equipment), noise levels would be 26 dBA L_{eq}. Assuming conservatively that nighttime ambient noise levels are 25 dBA L_{eq} in the project site vicinity, the project would increase nighttime ambient noise levels by approximately 3 dBA to 29 dBA L_{eq}. Therefore, project-related noise would not be discernable above ambient nighttime noise levels.

The proposed project's water pump station would be located approximately 90 feet from the nearest single-family residence across Dundee Avenue to the west of the project site. At a distance of 90 feet from the pump station, noise levels are conservatively calculated to be ~~31.5~~ 29.9 dBA L_{eq}, which would be discernable above ambient nighttime noise levels. However, the pump station would be designed to minimize noise, including soundproof air venting and concrete masonry block building material. These noise minimization features would further reduce the pump station's generated noise levels. In addition, the pumps would not operate continuously during nighttime hours. As detailed in the *Project Description*, the pumps housed inside the pump station would operate up to three hours per day as needed to replenish water in the tank. Operational noise impacts would be less than significant.

[1] Based on the average of the two reference noise measurements.

Off-Site Traffic Noise

Operation and maintenance activities would require approximately one trip per month to the project site. Off-site traffic noise impacts would be significant if traffic would result in a 3-dBA increase in traffic noise, which would be a barely perceptible increase for the average healthy ear (Caltrans 2020). A doubling of traffic volumes would be necessary to cause a 3-dBA increase (Crocker 2007).

Due to the low number of trips to the site, the project would not double existing daily traffic volumes and therefore would not result in a 3-dBA increase in traffic noise levels. Off-site traffic noise impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Certain types of construction equipment can generate high levels of groundborne vibration. Construction of the proposed project would potentially utilize loaded trucks and a bulldozer as well as a vibratory roller during the paving phase. Neither blasting nor pile driving would be required for construction of the proposed project. Construction vibration estimates are based on vibration levels reported by Caltrans and the FTA (Caltrans 2020; FTA 2018).

A quantitative assessment of potential vibration impacts from construction activities, such as blasting, pile-driving, vibratory compaction, demolition, drilling, or excavation, may be conducted using the equations developed by Caltrans and the FTA (Caltrans 2020; FTA 2018). Project construction activities would occur as close as 25 feet from the nearest structures, which are residences along Country Club Drive. Therefore, construction vibration impacts are assessed at a distance of 25 feet to estimate maximum vibration impacts to structures in the project area. Vibration levels at structures located at a distance of greater than 25 feet from the project site would be less than those experienced at structures located at 25 feet from the project site; therefore, vibration levels were not quantified at these receivers. As discussed under *Significance Thresholds*, construction vibration impacts would be significant if vibration levels exceed:

- 94 VdB, the level at which transient vibration sources, such as construction equipment, is considered to be distinctly perceptible; or
- 0.2 PPV, the threshold for assessing vibration impacts to structures.

Table 7 identifies typical construction equipment for water pipeline and tank construction projects and summarizes vibration levels at a distance of 25 feet.

Table 7 Vibration Levels during Construction Activities

Equipment	PPV at 25 feet (in/sec)	Approximate L_v VdB at 25 feet
Large bulldozer	0.089	87
Loaded trucks	0.076	83
Small bulldozer	0.003	58
Vibratory Roller	0.210	94
Jackhammer	0.035	79
Threshold	**0.2**	**94**
Threshold Exceeded?	Yes	No

PPV = peak particle velocity; in/sec = inches per second; VdB = vibration decibels

Source: FTA 2018

As shown in Table 7, groundborne vibration from construction equipment would not exceed 94 VdB, the identified threshold for human annoyance, at the nearest structures. However, the use of a vibratory roller would exceed 0.2 PPV, the threshold for assessing vibration impacts to structures. Mitigation Measure N-1 would prohibit the use of vibratory rollers. With mitigation, construction vibration impacts would be less than significant.

Operation of the proposed project would not generate vibration. No impact related to operational vibration would occur.

Mitigation Measures

The following mitigation measures are required to reduce vibration impacts to less-than-significant levels.

N-1 Use of Non-Vibratory or Pneumatic Tired Rollers

Construction activities shall use non-vibratory smooth wheel rollers or pneumatic tired rollers instead of vibratory rollers in order to reduce potentially significant groundborne vibration impacts on residences near the project site. Non-vibratory smooth wheel rollers and pneumatic tired rollers do not generate substantial vibration.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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?

As discussed in Section 9, *Hazards and Hazardous Materials*, the proposed project is not located within an airport land use plan or within two miles of a public airport or public use airport. The project site is not located within the vicinity of a private airstrip. No impact would occur.

NO IMPACT

14 Population and Housing

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

a. Would the project 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)?

The proposed project would involve the construction and operation of water storage and conveyance infrastructure. The project does not propose construction of new homes and would therefore not directly induce population growth in the service area. Although the proposed project would expand the storage capacity of existing water infrastructure by increasing the water storage capacity, the purpose of this project is to serve existing demand, accommodate projected growth in Santa Cruz County, and improve performance reliability rather than to serve new growth. The project would not result in acquisition of additional water supplies, and the project would not expand service beyond areas presently served by existing infrastructure. Furthermore, the new infrastructure would be maintained by existing SLVWD employees and would not indirectly induce population growth as a result of new employment opportunities. Therefore, the project would not indirectly support population growth. No impact related to substantial population growth would occur.

NO IMPACT

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The project would not displace people or housing, as no housing units exist on the project site. No impact related to displacement of people or housing would occur.

NO IMPACT

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15 Public Services

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:				
	1 Fire protection?	☐	☐	☐	■
	2 Police protection?	☐	☐	☐	■
	3 Schools?	☐	☐	☐	■
	4 Parks?	☐	☐	☐	■
	5 Other public facilities?	☐	☐	☐	■

a.1-5 Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 fire protection, police protection, schools, parks, and/or other public facilities?

As discussed in Section 14, *Population and Housing*, construction and operation of the proposed project would not result in direct or indirect population growth. In addition, the proposed project would build a new water storage tank, and would not result in new permanent facilities that would generate the need for additional fire or police protection services, schools, parks, or other public facilities. No impact to public services would occur.

NO IMPACT

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16 Recreation

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

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

As discussed in Section 14, *Population and Housing*, the proposed project would not directly or indirectly support substantial population growth. Therefore, the proposed project would not increase the need for or use of neighborhood and regional parks or other recreational facilities. No impact to recreational facilities would occur.

NO IMPACT

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17 Transportation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
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 use (e.g., farm equipment)?	☐	☐	☐	■
d. Result in inadequate emergency access?	☐	☐	■	☐

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The proposed project involves construction and operation of water storage and conveyance infrastructure that would not conflict with policies, plans, ordinances, or programs regarding the performance of the circulation system, public transit, bicycle, or pedestrian facilities. Construction of the pipeline would take two weeks to complete. Construction of the ~~proposed project~~ pipeline may require ~~a~~ temporary roadblocks ~~closure~~ on the 400 LF segment of Country Club Drive between Dundee Avenue and Scenic Way to accommodate trenching and pipeline installation activities. Construction of the pipeline segment would be temporary and limited to the two~~three~~-week pipeline construction period. ~~Any potential road closure would be temporary.~~

Construction of the proposed project would occur during the working hours of 8:00 a.m. to 5:00 p.m. Monday through Friday. Residents, emergency services (e.g., medical, fire, police), and other services (e.g., mail delivery, garbage and recycling pickup) would have coordinated access to Country Club Drive and surrounding streets throughout the construction period.

No roadblocks are proposed during construction of the water tank. Temporary roadblocks are proposed during pipeline construction, which would take approximately two weeks to complete. Road access would not be blocked for the entire two-week duration of construction. Per standard SLVWD practice for projects in roadways, outside the active construction hours of 8:00 a.m. to 5:00 p.m., steel roadway plates would cover open pipeline trenches, and vehicle access would be restored. In addition, during the 8:00 a.m. to 5:00 p.m. daily construction hours, the portion of the roadway under construction would be re-opened for traffic for increments of 10 minutes once every 45 minutes to one hour.

In emergency access or evacuation scenarios, steel plates placed alongside active trenches would quickly be used to restore vehicle access in the roadway. The Ben Lomond Fire Protection District has reviewed and approved the project site and construction area (Appendix G). In case of emergency, the Ben Lomond Fire Protection District would contact the construction contractor to restore road access immediately for emergency traffic.

Local residents and service providers (including emergency personnel, postal service, garbage, and recycling) would be contacted before roadway construction begins to schedule services around daily roadway openings and establish communication protocols with SLVWD for accommodating unscheduled access needs. In addition, if local residents have a special request for timed access (e.g., a scheduled time they need to leave or return to their home, scheduled construction at their home, etc.), they can contact SLVWD to accommodate road access at the scheduled time.

In addition, per the SLVWD construction contractor specifications, contractors would be responsible for basic traffic control measures to ensure the safety of vehicle traffic and material delivery, including providing flag persons at affected roadway segments and/or intersections and traffic control signage.

Larger equipment (e.g., water tank) may be temporarily staged at the large, flat, previously graded turnout off SR 9 across from Highlands County Park at 8500 CA-9 in Ben Lomond. Temporarily staged equipment would not occupy the entire turnout area, and would therefore not preclude its use for vehicle passing. No lane closures would be required.

As a result, construction-related impacts related to transportation would be less than significant.

Operation and maintenance activities would be conducted by SLVWD employees, and would require approximately one trip per month to the project site. These vehicle trips would represent a negligible increase in traffic and would not impact the performance of the transportation system. Operational transportation impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

CEQA Guidelines Section 15064.3(b) identifies criteria for evaluating transportation impacts. Specifically, the guidelines state vehicle miles traveled (VMT) exceeding an applicable threshold of significance may indicate a significant impact. According to Section 15064.3(b)(3) of the CEQA Guidelines, a lead agency may include a qualitative analysis of operational and construction traffic.

A VMT calculation is typically conducted on a daily or annual basis, for long-range planning purposes. As discussed under item (a), traffic on local roadways may be temporarily increased during project construction due to the presence of construction vehicles and equipment. Increases in VMT from construction would be short-term, minimal and temporary. In addition, maintenance of the proposed project would consist of monthly site visits. However, such visits would represent a *de minimis* increase in VMT in the project area and would be partially offset by VMT from trips which already occur and are associated with maintenance of the existing Swim Tanks, which would no longer be required. No impact associated with VMT per CEQA Guidelines Section 15064.3 would occur.

NO IMPACT

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

The project would not involve reconfiguration of any roadways or intersections that could result in a substantial increase in traffic hazards. No impact would occur.

NO IMPACT

d. Would the project result in inadequate emergency access?

As discussed in Section 9, *Hazards and Hazardous Materials*, construction of the proposed project may require a temporary road closure on the 400 LF segment of Country Club Drive between Dundee Avenue and Scenic Way to accommodate trenching and pipeline installation activities. ~~However, emergency responders would still be able to access this road and the surrounding roadways via Dundee Avenue and Scenic Way.~~ However, as discussed under item a, emergency services (e.g., medical, fire, police) would have coordinated access to Country Club Drive and surrounding streets throughout the construction period. In emergency access or evacuation scenarios, steel plates placed alongside active trenches would quickly be used to restore vehicle access in the roadway. All local service providers (including emergency personnel) would be contacted before roadway construction begins to schedule services around daily roadway openings and establish communication protocols with SLVWD for accommodating unscheduled access needs. In addition, per the SLVWD's construction contractor specifications, contractors would be responsible for basic traffic control measures to ensure the safety of vehicle traffic and material delivery, including providing flag persons at affected roadway segments and/or intersections and traffic control signage.

Project operation would not interfere with emergency access because the pipeline would be located entirely underground, and the aboveground infrastructure would not impede access in emergency response scenarios. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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18 Tribal Cultural Resources

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

As of July 1, 2015, California Assembly Bill 52 of 2014 (AB 52) was enacted and expands CEQA by defining a new resource category, "tribal cultural resources." AB 52 states, "A project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states the lead agency shall establish measures to avoid impacts altering the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3).

PRC Section 21074 (a)(1)(A) and (B) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and is:

1. Listed or eligible for listing in the CRHR or in a local register of historical resources as defined in PRC section 5020.1(k), or
2. 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 PRC Section 5024.1. In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified or adopted. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those having requested notice of projects proposed in the jurisdiction of the lead agency.

On June 10, 2020, SLVWD distributed AB 52 consultation letters for the proposed project, including project information, map, and contact information to five Native American tribes. The tribal governments provided with an AB 52 consultation letter (via certified mail) include the following list of recipients:

- Amah Mutsun Tribal Band
- Amah Mutsun Tribal Band of Mission San Juan Bautista
- Costanoan Ohlone Rumsen-Mutusn Tribe
- Indian Canyon Mutsun Band of Costanoan
- Muwekma Ohlone Indian Tribe of the San Francisco Bay Area

Under AB 52, Native American tribes typically have 30 days to respond and request further project information and request formal consultation. On April 23, 2020, an Executive Order issued by the California Governor (EO N-54-20) suspended the 30-day consultation window requirement for a period of 60 days. All deadlines associated with AB 52 consultation requests and initiation were suspended until June 22, 2020; therefore, the AB 52 consultation window for this project ended July 21, 2020.

On June 26, SLVWD sent follow-up emails to all contacted tribes. On June 29, SLVWD staff conducted follow-up phone calls. On June 29, Patrick Orozco requested a regional location map showing the project site, which SLVWD provided later that day. On July 6, 2020, Valentin Lopez from the Amah Mutsun Tribal Band responded with no comment on the project. Mr. Lopez requested that, in the event cultural resources are discovered on the project site, the tribe be contacted and cultural monitoring be required for the remainder of the work. No other responses were received. Accordingly, AB 52 consultation is complete for the project.

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is 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?

No tribal cultural resources have been identified on or near the project site. Therefore, the project would not cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074. No impact would occur.

NO IMPACT

19 Utilities and Service Systems

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
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?	☐	☐	■	☐

a. Would the project 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. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

c. Would the project 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?

The proposed project would involve the construction and operation of water storage and conveyance infrastructure. Although the proposed project would expand the storage capacity of existing water infrastructure by increasing the water storage capacity, the purpose of this project is to serve existing demand, accommodate planned growth, and improve performance reliability rather than to serve new growth. The project does not involve acquisition of new water supplies and would not expand potable water service beyond areas currently served by existing infrastructure. The proposed project would not generate sanitary wastewater, nor would it require natural gas or telecommunications service.

The proposed project would require approximately 22,000 kWh of electricity annually. The project would tie into the existing electrical grid, and would not require or result in the expansion or relocation of electric power facilities.

No impact related to water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities would occur.

NO IMPACT

d. Would the project 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. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Construction of the proposed project would generate solid waste in the form of soil during site preparation, excavation, and trenching activities. Soil would be re-used on site or hauled off site and disposed of in accordance with solid waste disposal regulations. Excavated soil not used on site would be transported to the Ben Lomond Santa Cruz County Transfer Station, from where it would be trucked to the Buena Vista Landfill. Buena Vista Landfill has a maximum daily throughput of 838 tons per day, and a remaining capacity of 2.2 million cubic yards (California Department of Resources Recycling and Recovery 2020).

Waste generation would be temporary, occurring only during project construction, and would be well below the 300 tons per day permitted capacity of the Ben Lomond Santa Cruz County Transfer Station and the remaining capacity of 2.2 million cubic yards at Buena Vista Landfill. Therefore, the project would not result in significant impacts to a local landfill.

Additional solid waste that would be generated (e.g., by-products of roadway construction including asphalt and concrete) would be disposed of in accordance with all applicable federal, State, and local statutes and regulations. Once constructed, operation and maintenance activities would not generate solid waste. As such, operation of the proposed project would not exceed permitted capacity at local landfills. Solid waste impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

20 Wildfire

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
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 downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	■

a. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

b. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project, 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. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslopes

or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The project site is not located in a Very High Fire Hazard Severity Zone. As discussed in Section 9, *Hazards and Hazardous Materials*, the project site is located in the Moderate Fire Hazard Severity Zone in the State Responsibility Area. The closest Very High Fire Hazard Severity Zone is located approximately three miles west of the project site (CAL FIRE 2007).

The project would not build habitable structures. In addition, the project would remove dead trees, branches, and secondary trunks from the existing redwood grove on the project site, which could serve as fuel for wildfires. Furthermore, the project would improve the reliability of local water supplies and reduce water loss through leaks, thereby bolstering water supplies for firefighting efforts. No adverse impact related to wildfire risk would occur.

NO IMPACT

21 Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Does the project:				
a. 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. 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. Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	■	☐

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?

As noted under Section 4, *Biological Resources,* one special status plant species and nine special status animal species have potential to occur within the project area. Although impacts to special status species could occur (e.g., injury or mortality to individuals if they are present within the project area during construction), Mitigation Measures BIO-1 through -5 would reduce impacts to candidate, sensitive, and special status species to a less-than-significant level. In addition, removal of five trees and placement of the tank within an area dominated by canary ivy would not significantly alter the function of the plant community on the project site. Accordingly, the project

would not 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, or substantially reduce or restrict the range of a rare or endangered plant or animal.

The project site does not contain any known archaeological or tribal cultural resources. As discussed in Section 5, *Cultural Resources*, standard best management practices identified in *Project Design Features* would be implemented during project construction in case of unanticipated discovery of cultural resources. As a result, the proposed project would not eliminate an important example of major periods of California history or prehistory. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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)?

Cumulative impacts are defined as two or more individual project effects which, when considered together or in concert with other projects, combine to result in a significant impact within an identified geographic area. In order for a project to contribute to cumulative impacts, it must result in some level of impact on a project-specific level. As described in the impact analyses provided in Sections 1 through 20 of this IS-MND, a number of the environmental topic areas would experience "No Impact" as a result of the proposed project; in other words, none of the significance criteria identified for these environmental topic areas would result in impacts. These environmental topics include the following: Agriculture and Forestry Resources; Energy; Land Use and Planning; Mineral Resources; Population and Housing; Public Services; Recreation; and Tribal Cultural Resources. These topic areas are not addressed further for cumulative impacts, because they would have no impact and therefore would not contribute to the cumulative scenario for cumulative impacts.

Cumulatively considerable impacts could occur if the construction of other projects occurs at the same time as the proposed project and in the same vicinity, such that the effects of similar impacts of multiple projects combine to expose adjacent sensitive receptors to greater levels of impact than would occur under the proposed project. For example, if the construction of other projects in the area occurs at the same time as construction of the proposed project, potential impacts associated with noise and traffic to residents in the project area may be more substantially affected. The Swim Tank Project would occur in the vicinity of the proposed project, and would involve the retirement of two existing redwood water tanks at the Swim Tank site. Construction activities would not overlap between the two projects. There are no other known cumulative projects in the area to which the project would contribute cumulative impacts.

The following analysis of cumulative impacts addresses those effects for which some level of potential impact was identified, which includes topics for which a "Less than Significant Impact" was identified, as well as those for which the threshold question assumed some level of impact (i.e., those for which consideration of a potential "significant" effect was considered, per *CEQA Guidelines* Section 15382; in this case, threshold questions which assumed impacts would be "Less than Significant with Mitigation Incorporated"). Potential regional cumulative effects were considered for the environmental topics which would result in less than significant impacts from implementation of the project (without or with project mitigation).

- **Aesthetics.** Temporary aesthetic impacts associated with the presence and use of equipment and machinery at and around the site would occur during project construction. If construction activities are consecutive between the Swim Tank Project and the proposed project, this period would be extended. However, these effects would be temporary in duration. Due to the steep terrain in the area and tree cover, the majority of both the Swim Tank site and the project site are blocked from public view. In addition, water storage facilities are part of the water system infrastructure and aesthetic landscape in the San Lorenzo Valley. Therefore, no contribution to cumulative impacts, significant or otherwise, would occur.
- **Air Quality.** Air pollutant emissions disperse from their original source and can affect the entire air basin. For air quality, the baseline analysis addresses the cumulative condition, or the project's contribution to the larger picture which is assessed in analyses of consistency with regional air quality strategies and pollutant dispersal. Air pollutant emissions associated with the project correlate with the construction equipment and machinery used during construction of the project. The region is in non-attainment for criteria pollutant standards for ozone, which means that cumulative air quality impacts are inherently significant. However, MBARD's significance thresholds are intended to determine whether a project would individually or cumulatively jeopardize attainment of the federal standards. The project's air criteria pollutant emissions would not exceed MBARD's significance thresholds. Therefore, air quality impacts of the project would not individually jeopardize attainment of the federal standards. Therefore, the project's contribution to cumulative impacts would not be considerable.
- **Biological Resources.** As described in Section 4, *Biological Resources*, the project could result in impacts to biological resources associated with construction activities on the project site. Implementation of Mitigation Measures BIO-1 through -5, discussed throughout the analysis of biological resources provided in Section 4, would reduce biological resources impacts to less-than-significant levels. The Swim Tank Project, and any other projects in the region, would also be required to comply with federal, State, regional, and local regulations and laws put in place to minimize impacts to biological resources. Therefore, cumulative impacts would be less than significant.
- **Cultural Resources.** Ground-disturbing activities during project construction could potentially result in the accidental discovery of unknown archaeological resources. However, the project would implement standard best management practices to be implemented in the event of unanticipated discovery of cultural resources. In addition, the project would not result in a substantial adverse change to a built environment resource listed or eligible for listing in the NRHP or the CRHR. Therefore, no contribution to cumulative impacts, significant or otherwise, would occur.
- **Geology and Soils.** Impacts associated with geology and soils, including paleontological resources, are inherently restricted to the location of the project activities. Mitigation Measure GEO-1, identified in Section 7, *Geology and Soils*, would require the project to implement recommendations from the geotechnical investigation. Due to the site-specific nature of impacts and the implementation of appropriate mitigation, the project would not contribute to cumulative impacts associated with other future developments.
- **GHG Emissions.** GHG emissions disperse from their original source and can affect the entire Earth. For GHG emissions, the baseline analysis addresses the cumulative condition, or the project's contribution to the larger picture which is assessed in analyses of consistency with climate change goals and policies. GHG emissions associated with the project correlate with the construction equipment and machinery used during construction of the project. The significance threshold based on SLOAPCD guidance is intended to determine whether a project would

individually or cumulatively contribute to significant climate change impacts. The project's GHG emissions would not exceed the significance thresholds. Therefore, the project's contribution to cumulative GHG impacts would not be considerable

- **Hazards and Hazardous Materials.** With regard to hazards and hazardous materials, no regional concern is identified (i.e., no significant cumulative impact). Regulatory compliance described in Section 9 would reduce potential impacts associated with potential hazards to a less-than-significant level. The project would also comply with applicable federal, State, and local laws and regulations regarding hazardous materials. Therefore, no contribution to cumulative impacts, significant or otherwise, would occur.
- **Hydrology and Water Quality.** With regard to hydrology and water quality, no regional concern is identified (i.e., no significant cumulative impact), as there are no impaired water bodies within the vicinity of the project site. Regulatory compliance described in Section 9 and implementation of Mitigation Measure GEO-1 would reduce potential impacts associated with potential hazards to a less-than-significant level. The Swim Tank Project and other projects in the vicinity of the project site would also be subject to regional requirements pertaining to reduction of impacts to hydrology and water quality. Therefore, no contribution to cumulative impacts, significant or otherwise, would occur.
- **Noise.** The project site is located within a rural residential area with low ambient noise levels. The analysis in this IS-MND concluded the project would not exceed noise thresholds established by the County of Santa Cruz for quiet rural environments. Construction of the Swim Tank Project would not occur simultaneously with the proposed project. Furthermore, given the rural residential environment of the project site and attenuation of noise, future development would not be anticipated to occur close enough to the immediate vicinity of the project site to result in cumulative noise impacts. No contribution to a cumulative impact, significant or otherwise, would occur.
- **Transportation.** The project would result in a temporary traffic impacts to the 400-foot portion of Country Club Drive between the Swim Tank site and the project site. No substantial long-term transportation impacts would occur as a result of the project. Given the temporary nature of construction-related traffic impacts and the fact that neither the Swim Tank Project nor the proposed project would generate a substantial amount of operational traffic, the contribution to a cumulative transportation impact, significant or otherwise, would not be cumulatively considerable.
- **Utilities and Service Systems.** The project would not induce population growth and therefore would not, directly or indirectly, contribute to cumulative impacts to utilities and service systems.
- **Wildfire.** As described in Section 20, *Wildfire*, the project site is not located in an area designated as a High Fire Hazard Severity Zone. Therefore, there would not be a significant cumulative impact. Furthermore, the project would not exacerbate wildfire risks. As discussed in Section 20, the project would remove dead trees, branches, and secondary trunks from the existing redwood grove on the project site, which could serve as fuel for wildfires. No contribution to cumulative impacts, significant or otherwise, would occur.

For these reasons, the project would not result in a considerable contribution to any cumulative effects significant or otherwise. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

In general, impacts to human beings are associated with air quality, hazards and hazardous materials, and noise impacts. As detailed in the preceding sections, the project would not result, either directly or indirectly, in adverse effects related to air quality. Implementation of Mitigation Measure GEO-1 would reduce potential impacts related to hazards to a less-than-significant level. Implementation of Mitigation Measure N-1 would reduce potential vibration impacts to a less-than-significant level. Accordingly, the project would not cause substantial adverse effects on human beings, either directly or indirectly. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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Rincon Consultants, Inc. prepared this IS-MND under contract to the San Lorenzo Valley Water District. Persons involved in data gathering analysis, project management, and quality control are listed below.

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Appendix A

Tree Resource Assessment/Construction Impact Assessment/Tree Protection Plan

Dedicated to the Preservation of Trees

San Lorenzo Valley Water District
Redwood Park Tank Construction Project

Tree Resource Analysis/
Construction Impact Assessment/
Tree Protection Plan

Prepared for
San Lorenzo Valley Water District

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ATTTACHMENTS

Tree Resource Inventory
Tree Location Map File
Construction Impact Assessment Sheet 1 of 2
Tree Protection/Revegetation Plan Sheet 2 of 2

ASSIGNMENT/SCOPE OF SERVICES

The San Lorenzo Valley Water District (SLVWD) is considering construction of a water storage tank at the intersection of Country Club Drive and Dundee Avenue in Ben Lomond CA, APN 078-233-05.

The area proposed for construction is populated with a dense grove of large mature coast redwood and other native tree species. In order to create a design that ensures tree health/stability, minimizes tree removal and protects tree resources on this site during construction I have completed the following tasks as requested by Carly Blanchard, SLVWD Environmental Planner:

- Locate, catalog and verify mapped locations trees/tree groups greater than 6 diameter inches within 20 feet of the limits of grading in AutoCAD format
    - NOTE: Several trees that were survey located were "field located" and mapped by measuring from surveyed elements; other trees, property corner stakes, etc.
- Identify each tree as to species
- Measure trunk diameter at a point 4.5 feet above grade
- Rate health, structure and preservation suitability as "good", "fair" or "poor"
- Define and map Critical Root Zones for each preserved tree
- Review project plans to determine potential impacts to tree resources
    - Geo-Technical report prepared by Haro Kasunich & Associates dated August 2019
    - Conceptual plans with site topography prepared by SLVWD
- Identify trees with active disease organisms or structural weakness that present risk to the redefined use of the site
- Provide recommendations for remedial treatments, maintenance and pre-construction treatments to improve tree condition and decrease risk in preparation for construction
- Create tree preservation specifications including a protection fencing plan
- Quantify tree replacement requirements for trees removed due to construction impacts, if any
    - Make recommendations for suitable species and placement
- Define and document a Mitigation Maintenance and Monitoring Program
- Provide all findings in the form of a Tree Resource Assessment/Construction Impact Analysis Report accompanied by an inventory and Tree Location Map/Preservation Plan
    - Electronic file in pdf format
    - Three hard copies

This assignment was limited to the above described services.

SUMMARY

Fifty-one (51) trees growing within and adjacent to the project boundary have been assessed and the known impacts resulting from the construction of proposed improvements defined at this time have been evaluated.

To construct the project as proposed, the removal of five (5) trees is necessary. Tree removal requirements are limited to one small, suppressed coast redwood and four tanbark oak trees. Trees #4, 5, 6, 47 and 48 proposed for removal are in poor condition and/or diseased. The required tree removal will not affect the future health and structural stability of the grove of coast redwoods.

The structure of the grove will be improved by the removal of dead trees, branches and secondary trunks. Trees #15, 17, 20 are dead and present a risk to the redefined use of the property. Trees 1, 2, 3, 12, 16, 27 and 35 through 39 are recommended to be pruned to remove dead branches and secondary trunks that could fall and injure people or damage property.

None of the trees to be removed meet "Significant" status, as defined by Santa Cruz County Code Chapter 16.34 *SIGNIFICANT TREES PROTECTION*. Trees should be pruned or removed in a controlled, sectional manner in order to minimize damage to the surrounding properties, power lines and trees to be preserved. Tree pruning/removal should be scheduled with respect to bird nesting or other wildlife protection criteria.

The proposed trenching and access road construction will result in significant root damage/loss and soil compaction. These procedures will negatively affect the future vigor of Trees #1, 2, 3, and 7 through 11. The implementation of Special Treatments to be defined by the Project Arborist once grade stakes are placed will diminish or eliminate damage potential. Special Treatments may include:

- Repositioning the propane tank and connection line to the Northwest of the Pump House
- Constructing the access road on natural grade
- Repositioning water/utility lines outside of Critical Root Zones (CRZ)
- Construct subterranean utility lines within CRZ using "trenchless" technology or by hand, without the use of mechanized equipment
- Post excavation root pruning

Five (5) fruit and nut trees along with three (3) blackberry bushes will be planted to revegetate the project

To ensure the survivability and proper growth of the replacement trees and bushes a five-year Maintenance and Monitoring Program (MM&P) has been defined with success criteria to meet a 100% survival rate.

Site inspections will be performed by the Project Arborist[1] at necessary intervals. Monitoring reports will be submitted to the San Lorenzo Valley Water District as requested

The implementation of Special Treatments as defined within this document along with adherence to Tree Preservation Specifications are required to assure the protection of 46 trees proposed for retention.

[1] **Project Arborist:** The Consulting Arborist as an authorized representative of the SLVWD and County, with the responsibility of periodic inspection of the project, contractor and subcontractors and contractor's equipment to determine compliance with the project specifications, the County of Santa Cruz tree preservation requirements and the cited professional standards.

BACKGROUND

I was contacted by Carly Blanchard, SLVWD Environmental Planner on March 30, 2020. She asked of my interest and availability to assess the construction impacts to tree resources on this project. Ms. Blanchard provided background materials and verbally described the project. I reviewed the documents and expressed interest in providing the requested service. I visited the site with Ms. Blanchard and Darren Langfield, SLVWD Chief Engineer on April 9 to review conceptual plans and briefly inspect tree resources for cost estimating purposes. I submitted a proposal the next day that was accepted early the following week. A service contract and Notice to Proceed was issued by the District on April 30.

The proposed project consists of the construction and operation of a 125,000-gallon, bolted steel water storage tank, 30 feet in diameter and 24 feet tall. An aerial electric drop is proposed to a new service at the pump station from the aerial transformer on the existing power pole across Dundee Avenue. Below ground water supply lines will connect the tank and pump station to provide residential service. A service/access road will connect the tank site to Country Club Drive

To complete the assessment, numerous site inspections were performed during the month of May 2020. A preliminary concept map file was provided by SLVWD. This base map file included property boundaries, topography, surveyed tree locations for approximately 90% of the trees onsite, proposed utility line placement, access road and water tank placement. Several trees that were not survey located were "field located" by measuring or approximating distance from known features; refuse staging area retaining wall, streets or surveyed trees and plotting the approximate tree trunk location on the map file provided. Numbered metal tags have been attached to each tree's trunk at six feet above grade. The corresponding numbers and tree locations are documented on the attached *Construction Impact Assessment Tree Location Map File "1".*

Impacts to tree resources resulting from the proposed construction was assessed. Necessary site improvements; Limits of Grading, soil stabilization requirements, drainage structure and utility line placement will not be confirmed until the grading plan is finalized and field staking representing cut/fill and disturbance limits are survey located and set in the field by the project survey team.

Tree classification and recommended procedures may change once the exact positions of the proposed improvements are known. Necessary changes will be defined in the field by the Project Arborist to be implemented by the SLVWD.

OBSERVATIONS

Site Description

The project spans approximately 6534 square feet of an undeveloped parcel located Northwest of the intersection of Dundee Avenue and Country Club Drive in Ben Lomond, California, APN 078-233-05.

The western third of the parcel slopes to the east at a gradient of about 35 percent. The steepest sections in this area are populated with dense tanbark oak saplings, hazel shrubs, Algerian ivy, blackberry and poison oak. There is very little growth within the proposed location of the tank save for two diseased tanbark oaks. The site slopes toward Dundee Avenue to the east at gradients of 20 to 5 percent. On the eastside of the parcel, a 3-foot high (±) cut slope descends to Dundee Avenue. This area is also densely vegetated with saplings and Algerian ivy groundcover.

OBSERVATIONS

Tree Descriptions

Tree resources growing within and directly adjacent to project boundaries are comprised of indigenous species including:

- big leaf maple, (*Acer macrophyllum*)
- tan bark oak, *(Notholithocarpus densiflorus*)
- Douglas fir, *(Pseudotsuga menziesii*)
- coast redwood, (*Sequoia sempervirens)*
- California bay, *(Umbellularia californica*)

A dense grove of coast redwood grows on the western extent of the project comprising more than 90% of the project's tree resources. This grove appears to be second or third generation, developed from shoots growing from the large diameter, decaying parent stumps.

The connection points between tree trunks and parent stumps is weakened by deterioration of the stumps wood fibers and subsequent decay development.

Decay, commonly referred to as rot is the primary pathogen that degrades wood strength and tree support capabilities. Boundaries are penetrated as cellulose and lignin, key components in the formation of wood are degraded.

Many of the trees have codominant trunk/stem attachments with imbedded/included bark. Codominant stems are by definition a structural weakness. They consist of stems of similar size originating from the same position on the trunk. In cases where the bark ridge turns inward the union between the two stems is much weaker. These types of attachments with included bark do not form connective tissues between the stems. The stems push against one another as they develop, literally growing themselves apart.

Canopy weight exerts additional stresses on the weak attachment point(s). Weak unions of this type can open and crack when stresses are applied to the upper crown of the tree and are typical of systems prone to failure. Imbedded/Included bark develops between two structural components (trunks, stems, branches) with a narrow angle of attachment as seen at left.. As diameter increases the forces push against one another, in essence "growing themselves apart".

Trunks with wider attachment angles form connective tissue resulting in stronger attachments. See red arrow in photo at right.

There are four tanbark oak trees and dozens of smaller diameter saplings within and adjacent to project boundaries.

This species is a virulent vector of *Phytophthora ramorum,* the pathogen that causes Sudden Oak Death. Tree # 47, pictured at the left is proposed for removal due to construction impacts. This tree displays frass, a combination of insect excrement and sawdust and exudation in the lower trunk. Each of these conditions are common in trees affected by Sudden Oak Death.

There are two big leaf maples growing on the property to the west and a few California bay saplings near the Project entry point.

Tree locations are documented on the attached *Tree Location Map File 1.*

TREE INVENTORY METHODOLOGY

Each tree was visually assessed from the root crown through the foliar canopy extents. The attached inventory lists information on trees ≥ 6 inches in diameter growing within or adjacent to project boundaries.

Round numbered metal tags were affixed to each tree/tree groups trunk. Tree locations are documented on the attached *Tree Location Map File 1*.

The tree inventory lists species, trunk diameter, tree health, structure and suitability ratings, Critical Root Zone extents (Preserved trees only), approximate canopy width and height, level of impacts and description, observations and required procedures.

Diameter is the width of the trunk measured at 4.5 feet above natural grade (ground level). For trees that were unable to be measured at 4.5 feet above natural grade, measurement heights are provided.

Health, Structure and Preservation Suitability Inventory ratings are based on the following criteria:

Tree health and structure are separate issues that are related since both are revealed by tree anatomy. A tree's vascular system is confined in a thin layer of tissue between the bark and wood layers. This thin layer is responsible for transport of nutrients and water between the root system and the foliar canopy. When this tissue layer is functioning properly a tree has the ability to produce foliage (leaves). As long as the tree maintains a connected vascular system it may appear to be in good health.

When conditions conducive to decay are present, fungi, bacteria or poor compartmentalization, wood strength is degraded. As decay advances, the tree's ability to continue standing is compromised. Thus, a tree can appear to be in good health, but have poor structure.

Tree Health: This rating is determined visually. Annual growth rates, leaf size and coloration are examined. Indications of insect activity, decay and dieback percentages are also used to define health ratings.

Trees in "**good**" health are full canopied, with dark green leaf coloration. Areas of foliar dieback or discoloration are less than 10% of the canopy. Dead material in the tree is limited to small twigs and branches less than one inch in diameter. There is no evidence of insects, disease or decay.

Trees with a "**fair**" health rating have from 10% to 30% foliar dieback, with faded coloration, dead wood larger than one inch, and/or visible insect activity, disease or decay.

Trees rated as having "**poor**" health have greater than 30% foliar dieback, dead wood greater than two inches, severe decay, disease or insect activity.

TREE INVENTORY METHODOLOGY, continued

Tree Structure: This rating is determined by visually assessing the roots, root crown (where the trunk meets the ground), supporting trunk, and branch structure. The presence of decay can affect both health and structural ratings.

Trees that receive a "**good**" structural rating are well rooted, with visible taper in the lower trunk, leading to buttress root development. These qualities indicate that the tree is solidly rooted in the growing site. No structural defects such as codominant stems (two stems of equal size that emerge from the same point), poorly attached branches, cavities, or decay are present.

Trees that receive a "**fair**" structural rating may have defects such as poor taper in the trunk, inadequate root development or growing site limitations. They may have multiple trunks, included bark (where bark turns inward at an attachment point), or suppressed canopies. Decay or previous limb loss (less than 2 inches in diameter) may be present in these trees. Trees with fair structure may be improved through proper maintenance procedures.

Poorly structured trees display serious defects that may lead to limb, trunk or whole tree failure due to uprooting. Trees in this condition may have had root loss or severe decay that has weakened their support structure. Trees in this condition can present a risk to people and structures. Maintenance procedures may reduce, but not eliminate these defects.

Suitability for preservation: This rating evaluates tree health, structure, species characteristics, age and potential longevity.

Trees with a "**good**" rating have adequate health and structure with the ability to tolerate moderate impacts and thrive for their safe, useful life expectancy.

A "**fair**" rating indicates health or structural problems have the ability to be corrected. They will require more monitoring and intense management with an expectation that their lifespan will be shortened by construction impacts.

Trees with a "**poor**" rating possess health or structural defects that cannot be corrected through treatment. Trees with poor suitability can be expected to continue to decline regardless of remedies provided. Species characteristics may not be compatible with redefined use of the area. Species which are non-native and unusually aggressive are considered to have a poor suitability rating.

Critical Root Zone: Individual tree root systems provide anchorage, absorption of water/minerals, storage of food reserves and synthesis of certain organic materials necessary for tree health and stability. The Critical Root Zone (CRZ) is the species-specific amount of roots necessary to continue to supply these elements essential for each tree to stand upright and maintain vigor. This distance reflects the minimum footage measurement from the trunk required for the protection of the tree's root zone. Construction activities proposed within these areas are subject to specific review and the implementation of recommended Special Treatments.

DESCRIPTION OF PROJECT IMPACTS

This section describes what procedures are proposed near the individual tree. The influences the proposed construction activities will have on the tree are classified as **None Known, Low, Moderate** or **High.** These classifications are defined as follows:

None Known, the tree is not near the known impact area of the proposed construction.

Low, adverse effects from the proposed construction activities are minimal.

Moderate, this level of impacts will result in loss in tree vigor and/or stability. Recommended procedures must be implemented to decrease these impacts.

High, requiring tree removal or the understanding that premature tree mortality can be anticipated. Mitigation is required for trees subject to this level of impacts.

Site inspections and review of the plans as presented identified numerous construction impacts to individual trees. The construction of this project as presented requires the following procedures:

- **Grading for site stabilization, access road and water tank construction as well as trenching for utility line construction.** These procedures require alteration of natural grade in the form of cut and/or fill (described below) at the defined "Limits of Grading". Roots shattered during this process provide openings for opportunistic decay causing organisms degrading tree support systems and vigor.

NOTE: The Geo-Technical report prepared by Haro Kasunich & Associates dated August 2019 states *the top 3 feet of soil of the tank pad area will need to be sub-excavated and removed offsite and replaced with select non-expansive engineered fill. In addition, there should be a minimum of 3 feet of engineered fill below the bottom of footings. The sub-excavation should extend a minimum of 5 feet beyond foundation perimeters.*

- **Alteration of natural grade**
  - Cuts, lowering of natural grade, require the removal of soil until the desired elevation is reached. A cut within the trees Critical Root Zone can remove non-woody and woody roots. Non-woody (absorbing) roots are responsible for transporting moisture and nutrients necessary for maintaining tree health. More significant cuts remove woody roots that provide structural support, compromising the tree's ability to stand upright.
  - Fill, increasing natural grade, often requires an initial cut to "knit in" and stabilize the material. This material is applied in layers and compacted in the process. Compaction breaks down soil structure by removing air and adding moisture. Anaerobic conditions may develop, promoting decay. Absorbing roots can suffocate from lack of oxygen. Structural roots may be compromised as a result of the decay.

REQUIRED PROCEDURES

Tree Removal

Five (5) trees will need to be removed to construct the project as projected. An additional four (4) trees are recommended to be removed since they are dead and will present a risk to the safe use of the facility. These tree are identified in the attached spreadsheet and listed as follows:

- **Removed due to Construction Impacts**
  - **Trees #4, 5, 6, 47 and 48**
- **Removed due to Condition**
  - **Trees #15, 17, 20 and 31**

NOTE; there will be a large number of tree saplings and native shrubs to removed that were not quantified.

Trees are to be removed in a controlled, sectional manner to avoid damaging surrounding trees to be preserved.

Tree locations are documented on the attached *Construction Impact Assessment/Tree Location Map File 1*.

Tree Maintenance

Maintenance pruning has been defined to remove dead branches, tops and stems for specific inventoried trees defined in the attached spreadsheet. This is necessary in order to decrease the risk of branches, stems and trunks falling and injuring workers or the facility.

- **Dead Branch, Top and Stem Removal: Trees #1, 2, 3, 12, 16, 27 and 35 through 39**

A state licensed, fully insured arborist using the most current versions of the following industry guidelines should be contracted to perform all tree pruning.

- American National Standards Institute A300 for Tree Care Operations-Tree, Shrub and Other Woody Plant Maintenance-Standard Practices.
  - (Part 1)-2001 Pruning
- International Society of Arboriculture: Best Management Practices
- American National Standards Institute Z133.1-1994 for Tree Care Operations-Pruning, Trimming, Repairing, Maintaining, and Removing Trees and Cutting Brush-Safety Requirements

Tree pruning/removal should be scheduled with respect to bird nesting or other wildlife protection criteria.

Special Treatments

- Relocate propane tank to the Northeast of the access road in order to decrease trenching requirements within Critical Root Zones

- Re-position utility/water line trenches outside Critical Root Zones and as far from tree trunks as possible

- Where trenches must remain within Critical Root Zones and cannot be repositioned;
  - Construct pipelines using trenchless technology, horizontal drilling etc.

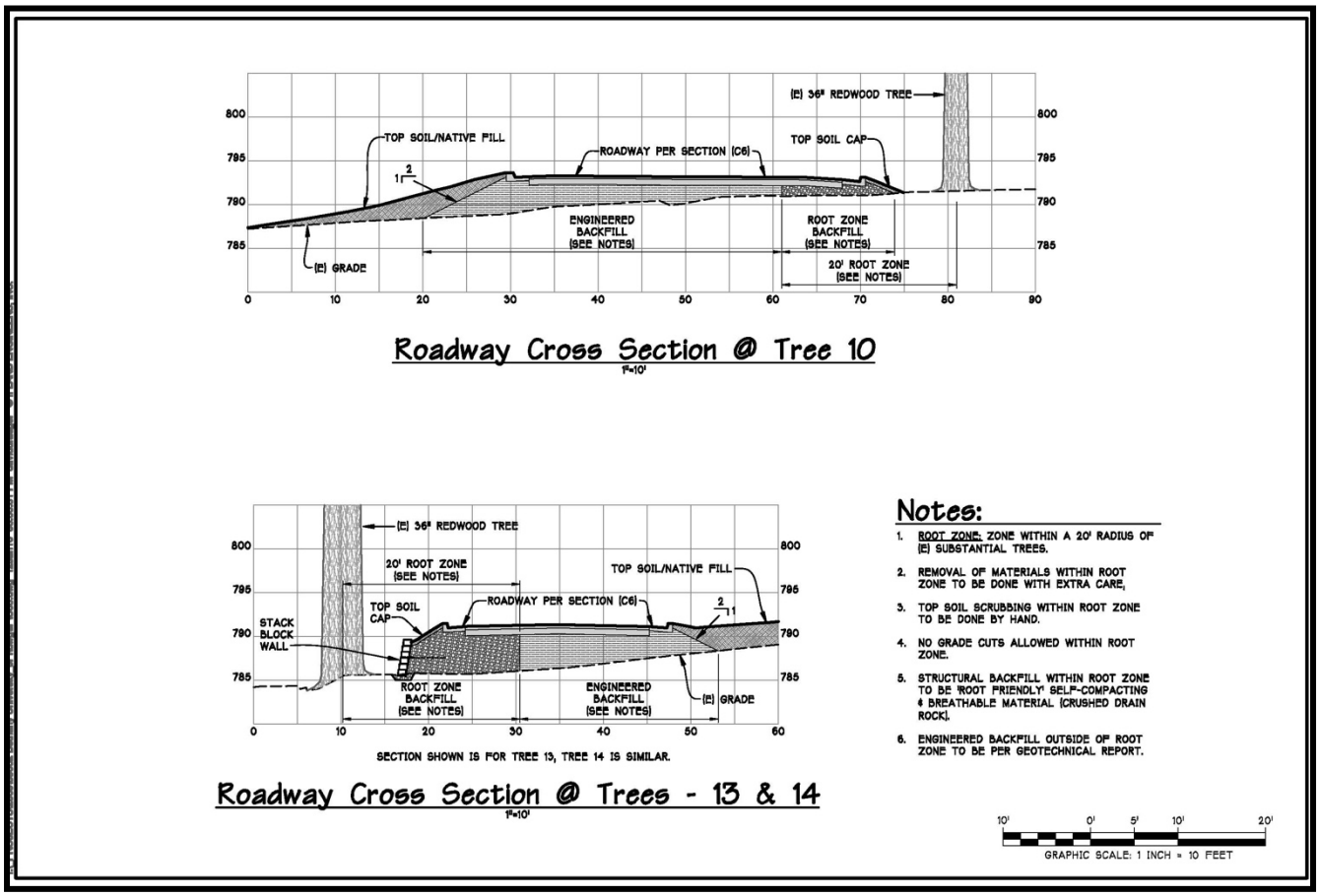
    OR
  - Excavate by hand, without the use of motorized equipment.

Special Treatments, continued

- Roots encountered will be cut cleanly employing the *Root Pruning* procedures defined below
- Spoils will be removed by loading into a small dump truck with wheels straddling the trench driving on sheets of 1 1/8" plywood or steel plates
- Install mechanical diversion barriers to avoid damage from future root growth
- Backfill will be applied using one small dump truck with wheels straddling the trench

- **Access Road Construction**

  The area proposed for the access road travels through the Critical Root Zone of Tree #1, 2, 3 and 7 through 11. In order to minimize compaction and root damage, it is recommended that the road be constructed <u>on natural grade</u> without excavation. Organic materials; leaf litter, twigs, brambles and groundcover will be removed by hand. The road base materials will be applied to a geotextile fabric such as Mirafi, or similar overlaid with the asphalt layer. The graphic below, prepared for a different project illustrates the concept but is not specific to this project.



Special Treatments, continued

- **Pre-Grading Root Severance, Trees #45, 46, 49 and 50;** A "Ditchwitch" type trencher with sharp cutting teeth will prune roots along the Limits of Grading to minimum depths of three feet under the direction of the Project Arborist. This machine can be used when the "Final Line of Disturbance" is near the perimeter of the Critical Root Zone following these procedures:
    - Establish a "final line of disturbance" with field staking. This line represents the furthest distance from the tree trunk that will allow the proposed construction.
    - Trench to a minimum three-foot depth along this established line.
    - Prune roots after trenching using the techniques defined below.

  A backhoe type machine may be required near several trees to be preserved on this site for preconstruction root severance treatments if the distance between these trees and the grading limit cannot be decreased. This procedure is defined below:
    - Establish a "final line of disturbance" with field staking. This line represents the furthest distance from the tree trunk that will allow the proposed construction.
    - Determine the depth of the cut required.
    - Begin digging 8 to 10 feet from the established line in a "spoke in wheel" pattern, using the tree trunk as the hub.
    - Dig toward the tree trunk to determine where roots are located to the required depth
    - Begin pruning roots using the techniques defined below.
    - Upon reaching the final line of disturbance make the final root pruning cuts
- **Root Pruning**
  Once the trencher has severed roots and grading equipment has removed soils from the root severance trench, roots are to be pruned cleanly leaving bark intact. All root pruning should be performed by skilled labor. The following tools should be used:
    - Hand-pruners/Loppers
    - Handsaw
    - Reciprocating saw
    - Chainsaw

When completed, the pruned portions should be covered with burlap or similar material and kept moist.

REVEGETATION

Compensation for tree removal required in order to complete the project will include:

- Preservation and Protection of 46 existing trees
- Implementation of Special Treatments to be defined by the Project Arborist once grade stakes are placed
- Tree and bush planting as a component of the planned landscape to be maintained in perpetuity
    - Five (5) fruit and nut trees of the following or similar species
        - apple *(Malus sp.)*
        - pear *(Pyrus sp.)*
        - walnut *(Juglans sp.)*
    - Three (3) blackberry bushes *(Rubus ursinus)*

Replacement tree and bush planting locations are documented on the attached *Tree Protection and Revegetation Map File "2"*.

Replacement tree nursery stock shall be standard (single trunk).

Trees planted should be well formed without co-dominant, poorly attached stems. Trees shall be disease free and absent of swirling or girdling roots.

Qualified professionals adhering to the following guidelines shall plant the replacement trees:

- Prepare the planting site by excavating 3 times the width and 2 inches less than the exact depth of the nursery container.
- Prune any visible matted or circling roots to remove or straighten them. Cut the root ball vertically on opposite sides at least half the distance to the trunk.
- Free roots from the root ball breaking away some of the soil to provide better contact between the root ball and the backfill soil.
- Backfill with native soil.
- After backfilling a two to four-inch layer of tree chip mulch should be applied to the soil layer. Chips should not be applied within 12 inches of the trunk.
- Stakes for support, should be driven on opposite sides of the root ball and driven into the soil. The tree can be secured to the stakes using "Arbortape" or by using the "ReadyStake" system.

Supplemental irrigation will be provided the new trees by means of a temporary "drip" emitter system for a period of two (2) years. This system shall be designed, installed and maintained by a qualified professional to maintain appropriate moisture levels.

Maintenance and Monitoring Program Criteria

To ensure the survivability and proper growth of the replacement trees success criteria will be defined to meet a 100% survival rate and implemented as follows.

- A qualified professional will monitor the newly planted trees at one (1) month intervals for the first year of growth and every 3 months thereafter for an additional four-year period
  - SLVWD personnel with landscape maintenance skills could be trained to assume the role of "qualified professional".
- Tree health and growth rates will be assessed
- Trees suffering poor growth rates or declining health will be identified
- Invigoration treatments will be provided
- Dead trees or trees in an irreversible state of decline will be replaced
- At the end of the five-year period the status of the new plantings will be assessed to make certain that success criteria have been met and all replacement trees planted are performing well

TREE PRESERVATION AND PROTECTION

Tree Preservation Structures shall be constructed of the following materials as field specified by the Project Arborist.

- Chain link, 72 inches, in height secured to metal stakes driven at least 18 inches into the soil.
- Temporary orange snow fencing attached to "T" posts driven into the ground
- Rice straw bales

Tree Preservation Structure locations are documented on the attached *Tree Protection and Revegetation Map File "2".*

Project Monitoring of the project will be the responsibility of the Project Arborist. Site inspections will take place at the following intervals:

- Following on-site placement of grade stakes
- During tree removal operations
- During preconstruction root severance
- After Tree Preservation fencing locations have been staked
- Following Tree Protection fencing installation and prior to the commencement of grading
- During all grading activities within Critical Root Zones
- As necessary during the grading activities to ensure compliance with all conditions of project approval

To ensure the protection of the trees remaining on this site it is imperative that the recommendations detailed within this document are incorporated as conditions of project approval.

Questions regarding this report may be directed to my office.

Respectfully submitted,

James P. Allen

James P. Allen
Registered Consulting Arborist #390

Tree Preservation Specifications

SLVWD Redwood Park Tank Project
APN 078-233-05

These guidelines should be printed on all pages of the development plans. Contractors and sub-contractors should be aware of tree protection guidelines and restrictions. Contracts should incorporate tree protection language that includes "damage to trees will be appraised using the Guide to Plant Appraisal 10th Edition and result in mitigation costs and monetary fines assessed".

1. **Preconstruction meeting with the Project Arborist:** A meeting with the Project Arborist, Project Manager and all contractors involved with the project shall take place prior to project initiation All tree preservation specifications will be reviewed and discussed.
2. **Field decisions:** The Project Arborist, Soils Engineer and Grading Contractor will work together to determine the most effective construction methods required to preserve and protect trees.
3. **Tree Preservation Zone (TPZ) establishment:** TPZ's shall be established as indicated on the attached map. The TPZ's shall be delineated by chain link fencing, no less than 72 inches in height with metal stakes embedded in the ground. Rice straw bales shall be placed circumventing the fence perimeters where necessary as defined by the Project Arborist. Bales shall be stabilized by driving metal stakes or sections of #5 rebar through the bales 12 to 18 inches into the soil surface, one at each end of bale. The fencing will be installed prior to the onset of the project under the supervision of the Project Arborist and shall not be moved.
4. **Restrictions within the Tree Preservation Zone (TPZ):** No storage of construction materials, debris or excess soil will be allowed within the TPZ. Parking of vehicles or construction equipment in this area is prohibited. Solvents, liquids or phytotoxic materials of any type shall never be stored or disposed of within the any TPZ and shall only be disposed of as prescribed by law.
5. **Grade Alterations:** Maintain the natural grade around all trees to be preserved. If tree roots are encountered during the construction process, the Project Arborist will be notified immediately. Exposed roots will be immediately covered with moistened burlap (or similar material) until the Project Arborist makes a determination as to required mitigation methods and extent of damage.
6. **Trenching requirements:** Any areas of where trenching is proposed will be evaluated with the Project Arborist and the Contractor prior to excavation or construction.
7. **Tree canopy alterations:** Unauthorized pruning of any tree on this site will not be allowed. Tree canopy alterations will be performed to the specifications established by the Project Arborist.
8. **Supplemental irrigation:** Irrigation shall be provided using "soaker" hoses or similar method of slow delivery. Supplemental irrigation requirements shall be determined by the Project Arborist and will be required prior to and after completion of the grading.
9. **Mulch Layer:** A 4-6 inch layer of tree chip mulch shall be applied within the Tree Preservation Zones (TPZ). Maintain a 12-inch distance from tree trunks that is free of chips or organic material or excess soil accumulation.

San Lorenzo Valley Water District
Redwood Park Tank Construction Project
APN 078-233-05

Dedicated to the Preservation of Trees

James P. Allen & Associates

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
1	coast redwood	86.9	Good	Poor	Fair	18	**MODERATE/ Within 17' of proposed access road and 14' from proposed waterline trench**	• Grows from decayed parent stump Divides into two, poorly attached trunks near grade Lower trunk engulfed by ivy and poison oak Pruned for utility line clearance Large diameter dead branches Lower branching removed to the height of 65' • **Preserve and Protect** **Remove dead branches** **Special Treatment Area**
2	coast redwood	Triple Trunk 21.7, 7.6 & 4.6	Fair	Poor	Fair	18	**MODERATE/ Within 9' of proposed access road and 7' from proposed waterline trench**	• Grows from decayed parent stump Divides into two, poorly attached trunks near grade Large diameter dead branches • **Preserve and Protect** **Remove dead branches** **Special Treatment Area**
3	coast redwood	44.7	Good	Fair	Good	18	**MODERATE/ Within 13' of proposed access road and 11' from proposed waterline trench**	• Grows from decayed parent stump Porly attached secondary stem develops at 4' above grade Large diameter dead branches • **Preserve and Protect** **Remove dead branches** **Special Treatment Area**
4	coast redwood	8.3	Poor	Fair	Poor	N/A	**HIGH/ Within proposed access road**	• Small, suppressed tree • **Remove due to Construction Impacts**
5	tanbark oak	8.8	Poor	Poor	Poor	N/A	**HIGH/ Within 3' of proposed access road**	• Trunk bows to Southeast • **Remove due to Construction Impacts**

San Lorenzo Valley Water District
Redwood Park Tank Construction Project
APN 078-233-05

Dedicated to the Preservation of Trees

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Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
6	tanbark oak	Double Trunk 4.9 & 3.5	Poor	Poor	Poor	N/A	**HIGH/ Within proposed access road**	• Canker in lower trunk • **Remove due to Construction Impacts**
7	coast redwood	60.3 @ 36" above grade	Fair	Poor	Fair	18	**MODERATE/ Within 6-7' of proposed access road and utility trench**	• Grows from decayed parent stump Divides into three, poorly attached trunks at 5' above grade • **Preserve and Protect** **Special Treatment Area** **Consider Relocating Propane Tank & Line Across Access Road**
8	coast redwood	54 @ 12" above grade	Fair	Poor	Fair	18	**MODERATE/ Within 7' of proposed access road and 11' from proposed utility trench**	• Grows from decayed parent stump Divides into three, poorly attached trunks near grade Suppressed to West • **Preserve and Protect** **Special Treatment Area** **Consider Relocating Propane Tank & Line Across Access Road**
9	coast redwood	22.5	Fair	Poor	Fair	18	**MODERATE/ Within 12' of proposed access road and 16' from proposed utility trench**	• Tall, suppresssed tree with minimal trunk taper Canopy is comprised of profuse sprout growth • **Preserve and Protect** **Special Treatment Area**
10	coast redwood	17.2	Fair	Fair	Good	14	**MODERATE/ Within 12' of proposed access road and 16' from proposed utility trench**	• Suppressed to West • **Preserve and Protect** **Special Treatment Area**

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
11	coast redwood	26.2	Fair	Fair	Fair	18	**LOW/ Within 16' of proposed access road and 19' from proposed utility trench**	• Grows from decayed parent stump Tall, suppresssed to Noprth and West Minimal trunk taper Canopy is comprised of profuse sprout growth • **Preserve and Protect** **Special Treatment Area**
12	coast redwood	54.2 @ 24" above grade	Fair	Poor	Fair	18	**LOW/ Within 20' of proposed access road and 23' from proposed utility trench**	• Grows from decayed parent stump Divides into three, poorly attached trunks near grade Suppressed to North and West Dead secondary trunk • **Preserve and Protect** **Remove dead secondary trunk**
13	coast redwood	16.4	Fair	Poor	Fair	12	**NONE KNOWN**	• Grows from decayed parent stump Suppresssed tree in center of grove • **Preserve and Protect**
14	coast redwood	46.5	Fair	Poor	Fair	18	**NONE KNOWN**	• Bowed trunk Low Live Crown ratio • **Preserve and Protect**
15	coast redwood	8.4	Dead	Dead	Dead	N/A	**NONE KNOWN**	• Dead • **Remove due to Condition** • **No**
16	coast redwood	11.6	Fair	Poor	Fair	12	**NONE KNOWN**	• Suppressed to West Dead top • **Preserve and Protect** **Remove dead top**

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
17	coast redwood	27.2	Dead	Dead	Dead	N/A	**NONE KNOWN**	• Brash trunk failure at 45' above grade No visible living tissue • **Remove due to Condition**
18	coast redwood	29	Fair	Poor	Fair	18	**NONE KNOWN**	• Suppressed to West • **Preserve and Protect**
19	coast redwood	45.6	Fair	Poor	Fair	18	**NONE KNOWN**	• Grows from decayed parent stump Divides into two, poorly attached trunks at 3' above grade Suppressed to West Low Live Crown Ratio • **Preserve and Protect**
20	coast redwood	9.8	Dead	Dead	Dead	N/A	**NONE KNOWN**	• Dead • **Remove due to Condition**
21	coast redwood	53 @ 24" above grade	Fair	Poor	Fair	18	**NONE KNOWN**	• Grows from decayed parent stump Divides into two, poorly attached trunks at 2' above grade Suppressed to the Northwest Bowed trunk Low Live Crown Ratio • **Preserve and Protect**
22	coast redwood	29.5	Fair	Poor	Fair	18	**NONE KNOWN**	• Suppressed to North and East Trunk bows to Southwest Low Live Crown Ratio • **Preserve and Protect**
23	coast redwood	7.5	Fair	Poor	Fair	18	**NONE KNOWN**	• Small. Suppressed tree Bowed trunk • **Preserve and Protect**
24	coast redwood	15.2	Fair	Poor	Fair	12	**NONE KNOWN**	• Suppressed to North and East Trunk bows to Southwest Low Live Crown Ratio • **Preserve and Protect**

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
25	coast redwood	28.2	Fair	Poor	Fair	18	**NONE KNOWN**	• Suppressed to North and East Trunk bows to Southwest Low Live Crown Ratio Secondary trunk has been removed at 3.5' above grade • **Preserve and Protect**
26	coast redwood	19.3	Fair	Poor	Fair	18	**NONE KNOWN**	• Suppressed to North Low Live Crown Ratio • **Preserve and Protect**
27	coast redwood	32.8	Fair	Poor	Fair	18	**NONE KNOWN**	• Grows from decayed parent stump Suppressed to North Poorly attached. dead secondary trunk to North Trunk bows to Southwest Low Live Crown Ratio • **Preserve and Protect** **Remove dead secondary trunk**
28	coast redwood	12.8	Fair	Poor	Fair	12	**NONE KNOWN**	• Small, suppressed tree Secondary sprout growth • **Preserve and Protect**
29	coast redwood	33.8	Fair	Poor	Fair	18	**NONE KNOWN**	• Top removed at 25' above grade • **Preserve and Protect**
30	coast redwood	12.3	Fair	Poor	Fair	10	**NONE KNOWN**	• Suppressed to East Low Live Crown Ratio • **Preserve and Protect**
31	coast redwood	10.5	Dead	Dead	Dead	N/A	**NONE KNOWN**	• Dead • **Remove due to Condition**

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
32	coast redwood	12.9	Fair	Poor	Fair	10	**NONE KNOWN**	• Grows from decayed parent stump Tall, suppressed tree Secondary sprout growth Minimum trunk taper • **Preserve and Protect**
33	coast redwood	15	Fair	Poor	Fair	12	**NONE KNOWN**	• Grows from decayed parent stump Suppressed to East Bowed trunk with sprout growth • **Preserve and Protect**
34	coast redwood	19.1	Fair	Poor	Fair	16	**NONE KNOWN**	• Grows from decayed parent stump Bowed trunk with sprout growth • **Preserve and Protect**
35	coast redwood	38.5	Fair	Poor	Fair	18	**NONE KNOWN**	• Grows from decayed parent stump Suppressed to North and East Bowed trunk Low Live Crown Ratio Dead branches • **Preserve and Protect** **Remove dead branches**
36	coast redwood	30.5	Fair	Poor	Fair	18	**NONE KNOWN**	• Suppressed to East Poor trunk attachment to #37 and 38 Bowed trunk Low Live Crown ratio Dead branches • **Preserve and Protect** **Remove dead branches**
37	coast redwood	27.3	Fair	Poor	Fair	18	**NONE KNOWN**	• Suppressed to South Poor trunk attachment to #37 and 38 Low Live Crown Ratio Dead branches • **Preserve and Protect** **Remove dead branches**

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
38	coast redwood	55.8 @ 18" above grade	Fair	Poor	Fair	18	**NONE KNOWN**	• Leans to the South Well-attached secondary trunk divides at 2' above grade Profuse sprout growth on lower trunk Dead branches • **Preserve and Protect** **Remove dead branches**
39	coast redwood	29.8 @ 18" above grade	Fair	Poor	Fair	18	**NONE KNOWN**	• Grows from decayed parent stump Suppressed to the South Poorly-attached, dead secondary trunk divides at 2' above grade • **Preserve and Protect** **Remove dead secondary trunk**
40	coast redwood	7.1	Fair	Poor	Fair	8	**NONE KNOWN**	• Suppressed Profuse sprout growth • **Preserve and Protect**
41	coast redwood	18.2	Fair	Poor	Fair		**NONE KNOWN**	• Small tree Suppressed to South • **Preserve and Protect**
42	coast redwood	21.1	Fair	Poor	Fair	18	**NONE KNOWN**	• Mechanical wound on south side of trunk Visible bark damage Low Live Crown Ratio • **Preserve and Protect**
43	coast redwood	22.8	Fair	Poor	Fair	18	**NONE KNOWN**	• Dead ivy encircles trunk Suppressed to West Low Live Crown Ratio • **Preserve and Protect**
44	coast redwood	20.1	Fair	Poor	Fair	18	**NONE KNOWN**	• Ivy encircles trunk Suppressed to West Low Live Crown Ratio • **Preserve and Protect**

Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
45	coast redwood	27.5	Fair	Poor	Fair	18	**MODERATE/ Within 8' of proposed CMU retaining wall**	• Grows from decayed parent stump Ivy encircles trunk Suppressed to West • **Preserve and Protect** **Special Treatment Area**
46	coast redwood	Group of 4 Trunks 32.6, 28.4, 27 & 23.8	Fair	Poor	Fair	18	**LOW/ Within 15' of proposed CMU retaining wall**	• Grows from decayed parent stump Ivy encircles trunk Suppressed in several compass directions Northernmost trunk has been topped at approximately 80' above grade • **Preserve and Protect** **Special Treatment Area**
47	tan bark oak	15.5	Poor	Poor	Poor	N/A	**HIGH/ Within proposed water tank**	• Trunk encircled by ivy growth Frass and exudation; common symptoms of Sudden Oak Death Syndrome • **Remove due to Construction Impacts**
48	tan bark oak	6	Fair	Poor	Poor	N/A	**HIGH/ Within proposed water tank**	• Trunk encircled by ivy growth Dead top • **Remove due to Construction Impacts**
49	big leaf maple	23.8 @ 6" above grade	Fair	Poor	Fair	18	**MODERATE/ Within 10' of proposed CMU retaining wall**	• Grows on neighboring property to the West Divides into three, well-attached stems at 2' above grade Evidence of decay in lower trunk Dead ivy encircles lower trunks Suppressed to East Asymmetrical canopy • **Preserve and Protect** **Special Treatment Area**

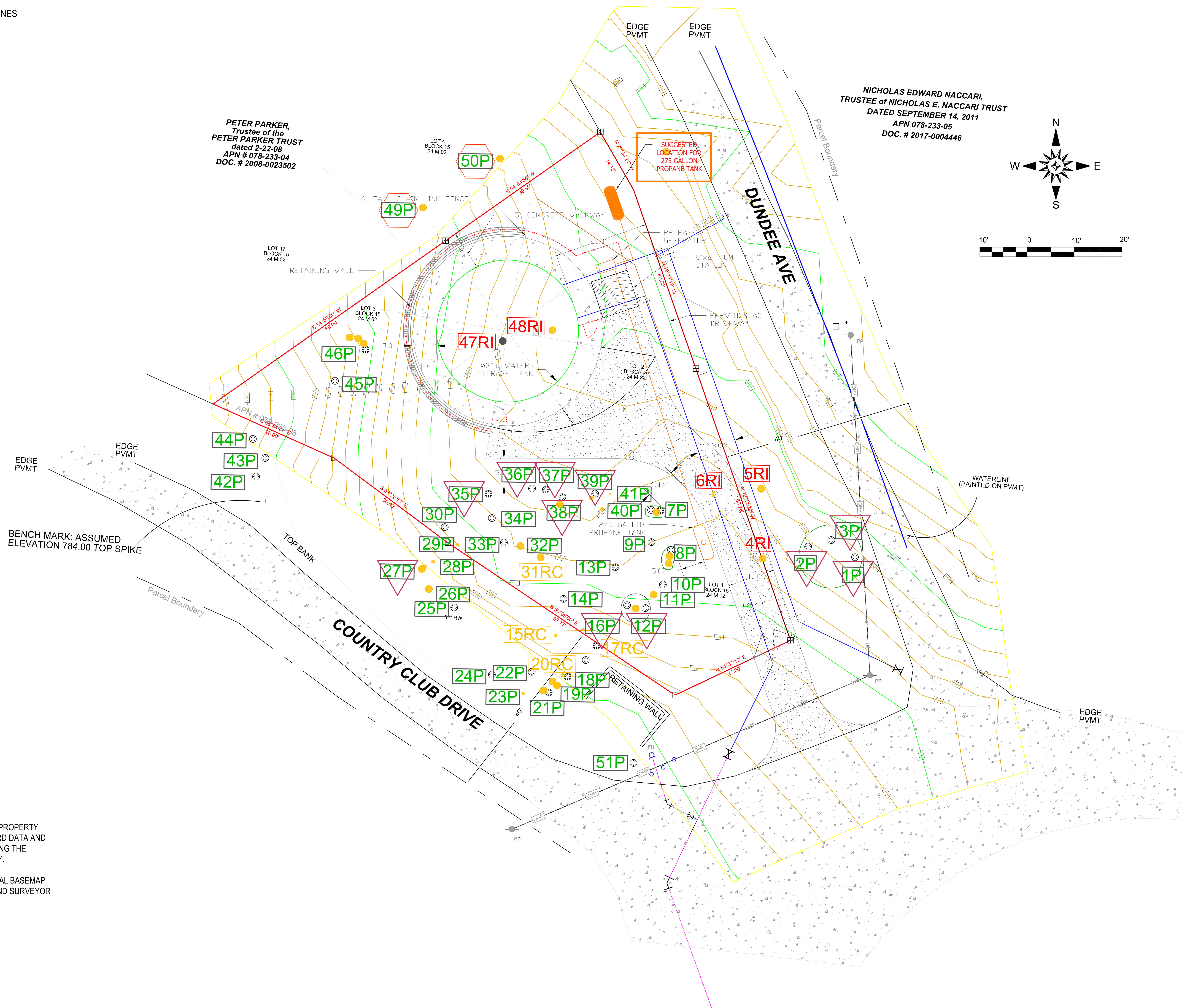
Tree Resource Inventory

TREE #	SPECIES	DIAMETER @ 4.5ft ABOVE NATURAL GRADE (INCHES)	HEALTH	STRUCTURE	SUITABILITY	CRITICAL ROOT ZONE (CRZ), Radial Feet *Preserved Trees Only	IMPACTS LEVEL/ Description	•OBSERVATIONS •RECOMMENDED PROCEDURES •CRITICAL ROOT ZONE (CRZ), Radial Feet
50	big leaf maple	18.9 @ grade	Fair	Poor	Fair	18	**LOW/ Within 15' of proposed CMU retaining wall**	• Grows on neighboring property to the West Divides into six, poorly-attached stems between 6" and 5' above grade Evidence of decay in lower trunk Suppressed to East Asymmetrical canopy • **Preserve and Protect** **Special Treatment Area**
51	Douglas fir	13.1	Fair	Poor	Fair	12	**NONE KNOWN**	• Leans to West Asymmetrical canopy Pruned for utility line clearance Dead and dying branches • **Preserve and Protect** **Remove dead branches**

LEGEND

= PROPERTY LINES

= ADJOINING PROPERTY LINES



REFERENCES

24 M 02
CR 539
DOC. # 2017-0004446
DOC. # 2008-0023502

NOTE

THIS IS NOT A BOUNDARY SURVEY. THE PROPERTY LINES SHOWN ARE DRAWN FROM RECORD DATA AND MAY BE FOUND TO BE DIFFERENT PENDING THE RESULTS OF A FULL BOUNDARY SURVEY.

ELEVATIONS, CONTOUR LINES, AND INITIAL BASEMAP FROM PAUL JENSEN, PROFESSIONAL LAND SURVEYOR

Map Key / Legend

- Survey Located Tree Trunk Location
- Field Located Tree Trunk Location
- 1 Assigned Tree Number
- 2P Preserve and Protect
- 4RC Remove due to Condition
- 3RI Remove due to Construction Impacts
- 2 Grows on Neighboring Property
- 2 Dead branch/stem or top to be pruned/removed

San Lorenzo Valley Water District
Redwood Park Tank Project

Tree Resource Analysis/ Construction Impact Assessment Tree Location Map

Entire Site at 10 Scale

San Lorenzo Valley Water District
Redwood Park Tank Construction Project
Intersection of Dundee & Country Club, Ben Lomond
APN 078-233-05

Tree Location Map

James P. Allen & Associates

119 Surfside Avenue, Santa Cruz CA 95060
office 831.426.6603
email jpallen@consultingarborists.com

1 of 2

Date: 05/31/20
Revision: XX/XX/XX

LEGEND

= PROPERTY LINES

= ADJOINING PROPERTY LINES

PETER PARKER, Trustee of the PETER PARKER TRUST dated 2-22-08 APN # 078-233-04 DOC. # 2008-0023502

NICHOLAS EDWARD NACCARI, TRUSTEE of NICHOLAS E. NACCARI TRUST DATED SEPTEMBER 14, 2011 APN 078-233-05 DOC. # 2017-0004446

Blackberry Bush Location

Fruit or Nut Tree Location

DUNDEE AVE

COUNTRY CLUB DRIVE

Parcel Boundary

SUGGESTED LOCATION FOR 275 GALLON PROPANE TANK

275 GALLON PROPANE TANK

PROPANE GENERATOR

8'x8' PUMP STATION

PERVIOUS AC DRIVEWAY

Ø30.0 WATER STORAGE TANK

6' TALL CHAIN LINK FENCE

4' CONCRETE WALKWAY

RETAINING WALL

EDGE PVMT

WATERLINE (PAINTED ON PVMT)

BENCH MARK: ASSUMED ELEVATION 784.00 TOP SPIKE

TOP BANK

50P 49P 46P 45P 44P 43P 42P 36P 37P 39P 35P 41P 30P 34P 38P 40P 7P 29P 33P 32P 9P 8P 27P 28P 13P 10P 11P 26P 25P 14P 16P 12P 3P 2P 1P 24P 22P 18P 23P 19P 21P 51P

N

W E

S

10' 0 10' 20'

REFERENCES

24 M 02
CR 539
DOC. # 2017-0004446
DOC. # 2008-0023502

NOTE

THIS IS NOT A BOUNDARY SURVEY. THE PROPERTY LINES SHOWN ARE DRAWN FROM RECORD DATA AND MAY BE FOUND TO BE DIFFERENT PENDING THE RESULTS OF A FULL BOUNDARY SURVEY.

ELEVATIONS, CONTOUR LINES, AND INITIAL BASEMAP FROM PAUL JENSEN, PROFESSIONAL LAND SURVEYOR

Map Key / Legend

- Surveyed Located Tree Trunk Location
- Field Located Tree Trunk Location
- 2P — Preserve and Protect
- 2 — Grows on Neighboring Property
- 2 — Dead branch/stem or top to be pruned/removed
- Critical Root Zone, (CRZ)
- Tree Preservation Zone
- Tree Preservation Fencing With Straw Bales
- Pre-construction Root Pruning, Trees #36, 37 and 45-48
- On Grade Access Road Construction
- Suggested Propane Tank Relocation position
- Relocate Water Lines Beyond CRZs or Hand Excavate

REVEGETATION PROGRAM

- Five Fruit and Nut Trees
  - apple (Malus sp.)
  - pear (Pyrus sp.)
  - walnut (Juglans sp.)
- 3 Blackberry Bushes (Rubus ursinus)

San Lorenzo Valley Water District
Redwood Park Tank Project

Tree Protection Plan/ Revegetation Program Tree Location Map

Entire Site at 10 Scale

San Lorenzo Valley Water District
Redwood Park Tank Construction Project
Intersection of Dundee & Country Club, Ben Lomond
APN 078-233-05

Tree Location Map

James P. Allen & Associates
119 Surfside Avenue, Santa Cruz CA 95060
office 831.426.6603
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Date: 05/31/20
Revision: XX/XX/XX

Appendix B

Special-Status Wildlife and Plant Species Table

Special Status Plant Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Agrostis blasdalei Blasdale's bent grass	None/None G2/S2 1B.2 BLM_S-Sensitive | SB_UCSC-UC Santa Cruz	Coastal bluff scrub, Coastal dunes, Coastal prairie. 0 - 150 m. perennial rhizomatous herb. Blooms May-Jul	Not Expected	Suitable habitat is not present.
Amsinckia lunaris bent-flowered fiddleneck	None/None G3/S3 1B.2 BLM_S-Sensitive | SB_UCBG-UC Botanical Garden at Berkeley | SB_UCSC-UC Santa Cruz	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland. 3 - 500 m. annual herb. Blooms Mar-Jun	Not Expected	Suitable habitat is not present.
Arctostaphylos andersonii Anderson's manzanita	None/None G2/S2 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz	Broadleafed upland forest, Chaparral, North Coast coniferous forest. openings, edges. 60 - 760 m. perennial evergreen shrub. Blooms Nov-May	Not Expected	Suitable habitat is not present, and no manzanita's were observed on-site.
Arctostaphylos glutinosa Schreiber's manzanita	None/None G1/S1 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz | SB_USDA-US Dept of Agriculture	Closed-cone coniferous forest, Chaparral. diatomaceous shale. 170 - 685 m. perennial evergreen shrub. Blooms (Nov)Mar-Apr	Not Expected	Suitable habitat is not present, and no manzanita's were observed on-site.
Arctostaphylos ohloneana Ohlone manzanita	None/None G1/S1 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_USDA-US Dept of Agriculture	Closed-cone coniferous forest, Coastal scrub. siliceous shale. 450 - 530 m. evergreen shrub. Blooms Feb-Mar	Not Expected	Suitable habitat is not present, and no manzanita's were observed on-site.
Arctostaphylos pajaroensis Pajaro manzanita	None/None G1/S1 1B.1 BLM_S-Sensitive	Chaparral (sandy). 30 - 760 m. perennial evergreen shrub. Blooms Dec-Mar	Not Expected	Suitable habitat is not present, and no manzanita's were observed on-site.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Arctostaphylos regismontana Kings Mountain manzanita	None/None G2/S2 1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest. granitic or sandstone. 305 - 730 m. perennial evergreen shrub. Blooms Dec-Apr	Not Expected	Suitable habitat is not present, and no manzanita's were observed on-site.
Arctostaphylos silvicola Bonny Doon manzanita	None/None G1/S1 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest. inland marine sands. 120 - 600 m. perennial evergreen shrub. Blooms Jan-Mar	Not Expected	Suitable habitat is not present, and no manzanita's were observed on-site.
Arenaria paludicola marsh sandwort	FE/CE G1/S1 1B.1 SB_SBBG-Santa Barbara Botanic Garden	Marshes and swamps (freshwateror brackish). sandy, openings. 3 - 170 m. perennial stoloniferous herb. Blooms May-Aug	Not Expected	Suitable habitat is not present.
Calyptridium parryi var. *hesseae* Santa Cruz Mountains pussypaws	None/None G3G4T2/S2 1B.1 BLM_S-Sensitive	Chaparral, Cismontane woodland. sandy or gravelly, openings. 305 - 1530 m. annual herb. Blooms May-Aug	Not Expected	Suitable habitat is not present.
Campanula californica swamp harebell	None/None G3/S3 1B.2 BLM_S-Sensitive	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (freshwater), North Coast coniferous forest. mesic. 1 - 405 m. perennial rhizomatous herb. Blooms Jun-Oct	Not Expected	Suitable habitat is not present.
Carex comosa bristly sedge	None/None G5/S2 2B.1	Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland. 0 - 625 m. perennial rhizomatous herb. Blooms May-Sep	Not Expected	Suitable habitat is not present.
Carex saliniformis deceiving sedge	None/None G2/S2 1B.2	Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps (coastal salt). mesic. 3 - 230 m. perennial rhizomatous herb. Blooms May-Jun(Jul)	Not Expected	Suitable habitat is not present.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	None/None G3T1T2/S1S2 1B.1 BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden	Valley and foothill grassland (alkaline). 0 - 230 m. annual herb. Blooms May-Oct(Nov)	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Chorizanthe pungens var. *hartwegiana* Ben Lomond spineflower	FE/None G2T1/S1 1B.1	Lower montane coniferous forest (maritime ponderosa pine sandhills). 90 - 610 m. annual herb. Blooms Apr-Jul	Not Expected	Suitable habitat is not present.
Chorizanthe pungens var. *pungens* Monterey spineflower	FT/None G2T2/S2 1B.2 SB_SBBG-Santa Barbara Botanic Garden | SB_UCBG-UC Botanical Garden at Berkeley	Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland. sandy. 3 - 450 m. annual herb. Blooms Apr-Jun(Jul-Aug)	Not Expected	Suitable habitat is not present.
Chorizanthe robusta var. *hartwegii* Scotts Valley spineflower	FE/None G2T1/S1 1B.1	Meadows and seeps (sandy), Valley and foothill grassland (mudstone and Purisima outcrops). 230 - 245 m. annual herb. Blooms Apr-Jul	Not Expected	Suitable habitat is not present.
Chorizanthe robusta var. *robusta* robust spineflower	FE/None G2T1/S1 1B.1 BLM_S-Sensitive	Chaparral (maritime), Cismontane woodland (openings), Coastal dunes, Coastal scrub. sandy or gravelly. 3 - 300 m. annual herb. Blooms Apr-Sep	Not Expected	Suitable habitat is not present.
Cirsium fontinale var. *campylon* Mt. Hamilton thistle	None/None G2T2/S2 1B.2 BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Valley and foothill grassland. serpentinite seeps. 100 - 890 m. perennial herb. Blooms (Feb)Apr-Oct	Not Expected	Suitable habitat is not present.
Collinsia multicolor San Francisco collinsia	None/None G2/S2 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz	Closed-cone coniferous forest, Coastal scrub. sometimes serpentinite. 30 - 250 m. annual herb. Blooms (Feb)Mar-May	Not Expected	Suitable habitat is not present.
Dacryophyllum falcifolium tear drop moss	None/None G2/S2 1B.3 USFS_S-Sensitive	North Coast coniferous forest. carbonate. 50 - 275 m. moss. Blooms	Not Expected	Suitable habitat is not present.
Dudleya abramsii ssp. *setchellii* Santa Clara Valley dudleya	FE/None G4T2/S2 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	Cismontane woodland, Valley and foothill grassland. serpentinite, rocky. 60 - 455 m. perennial herb. Blooms Apr-Oct	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Eriogonum nudum var. *decurrens* Ben Lomond buckwheat	None/None G5T1/S1 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Lower montane coniferous forest (maritime ponderosa pine sandhills). sandy. 50 - 800 m. perennial herb. Blooms Jun-Oct	Not Expected	Suitable habitat is not present.
Erysimum teretifolium Santa Cruz wallflower	FE/CE G1/S1 1B.1	Chaparral, Lower montane coniferous forest. inland marine sands. 120 - 610 m. perennial herb. Blooms Mar-Jul	Not Expected	Suitable habitat is not present and this species was not observed during the blooming period.
Fissidens pauperculus minute pocket moss	None/None G3?/S2 1B.2 USFS_S-Sensitive	North Coast coniferous forest (damp coastal soil). 10 - 1024 m. moss. Blooms	Low potential	Suitable habitat is present.
Fritillaria liliacea fragrant fritillary	None/None G2/S2 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | USFS_S-Sensitive	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland. Often serpentinite. 3 - 410 m. perennial bulbiferous herb. Blooms Feb-Apr	Not Expected	Suitable habitat is not present.
Grimmia torenii Toren's grimmia	None/None G2/S2 1B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest. Openings, rocky, boulder and rock walls, carbonate, volcanic. 325 - 1160 m. moss. Blooms	Not Expected	Suitable habitat is not present.
Grimmia vaginulata vaginulate grimmia	None/None G2G3/S1 1B.1	Chaparral (openings). Rocky, boulder and rock walls, carbonate. 685 - 685 m. moss. Blooms	Not Expected	Suitable habitat is not present.
Hesperevax sparsiflora var. *brevifolia* short-leaved evax	None/None G4T3/S2 1B.2 BLM_S-Sensitive	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie. 0 - 215 m. annual herb. Blooms Mar-Jun	Not Expected	Suitable habitat is not present.
Hesperocyparis abramsiana var. *abramsiana* Santa Cruz cypress	FT/CE G1T1/S1 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest. sandstone or granitic. 280 - 800 m. perennial evergreen tree. Blooms	Not Expected	Suitable habitat is not present and cypress trees were not observed on-site.
Hesperocyparis abramsiana var. *butanoensis* Butano Ridge cypress	FT/CE G1T1/S1 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest. Sandstone. 400 - 490 m. perennial evergreen tree. Blooms Oct	Not Expected	Suitable habitat is not present and cypress trees were not observed on-site.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Hoita strobilina Loma Prieta hoita	None/None G2?/S2? 1B.1	Chaparral, Cismontane woodland, Riparian woodland. usually serpentinite, mesic. 30 - 860 m. perennial herb. Blooms May-Jul(Aug-Oct)	Not Expected	Suitable habitat is not present.
Holocarpha macradenia Santa Cruz tarplant	FT/CE G1/S1 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBG-UC Botanical Garden at Berkeley	Coastal prairie, Coastal scrub, Valley and foothill grassland. often clay, sandy. 10 - 220 m. annual herb. Blooms Jun-Oct	Not Expected	Suitable habitat is not present.
Horkelia cuneata var. *sericea* Kellogg's horkelia	None/None G4T1?/S1? 1B.1 SB_UCSC-UC Santa Cruz | USFS_S-Sensitive	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub. sandy or gravelly, openings. 10 - 200 m. perennial herb. Blooms Apr-Sep	Not Expected	Suitable habitat is not present.
Horkelia marinensis Point Reyes horkelia	None/None G2/S2 1B.2	Coastal dunes, Coastal prairie, Coastal scrub. sandy. 5 - 755 m. perennial herb. Blooms May-Sep	Not Expected	Suitable habitat is not present.
Lasthenia californica ssp. *macrantha* perennial goldfields	None/None G3T2/S2 1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub. 5 - 520 m. perennial herb. Blooms Jan-Nov	Not Expected	Suitable habitat is not present.
Lessingia micradenia var. *glabrata* smooth lessingia	None/None G2T2/S2 1B.2 SB_BerrySB-Berry Seed Bank | SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Valley and foothill grassland. serpentinite, often roadsides. 120 - 420 m. annual herb. Blooms (Apr-Jun)Jul-Nov	Not Expected	Suitable habitat is not present.
Malacothamnus arcuatus arcuate bush-mallow	None/None G2Q/S2 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland. 15 - 355 m. perennial evergreen shrub. Blooms Apr-Sep	Not Expected	Suitable habitat is not present.
Microseris paludosa marsh microseris	None/None G2/S2 1B.2 SB_SBBG-Santa Barbara Botanic Garden | SB_UCSC-UC Santa Cruz	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland. 5 - 355 m. perennial herb. Blooms Apr-Jun(Jul)	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Monardella sinuata ssp. *nigrescens* northern curly-leaved monardella	None/None G3T2/S2 1B.2 SB_SBBG-Santa Barbara Botanic Garden	Chaparral (SCR Co.), Coastal dunes, Coastal scrub, Lower montane coniferous forest (SCR Co., ponderosa pine sandhills). Sandy. 0 - 300 m. annual herb. Blooms (Apr)May-Jul(Aug-Sep)	Not Expected	Suitable habitat is not present.
Monolopia gracilens woodland woolythreads	None/None G3/S3 1B.2	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland. Serpentine. 100 - 1200 m. annual herb. Blooms (Feb)Mar-Jul	Not Expected	Suitable redwood habitat is present, however serpentine soils are not and this species was not observed during the appropriate blooming period.
Orthotrichum kellmanii Kellman's bristle moss	None/None G2/S2 1B.2 USFS_S-Sensitive	Chaparral, Cismontane woodland. sandstone, carbonate. 343 - 685 m. moss. Blooms Jan-Feb	Not Expected	Suitable habitat is not present.
Pedicularis dudleyi Dudley's lousewort	None/CR G2/S2 1B.2 USFS_S-Sensitive	Chaparral (maritime), Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland. 60 - 900 m. perennial herb. Blooms Apr-Jun	Not Expected	Suitable habitat is not present.
Penstemon rattanii var. *kleei* Santa Cruz Mountains beardtongue	None/None G4T2/S2 1B.2	Chaparral, Lower montane coniferous forest, North Coast coniferous forest. 400 - 1100 m. perennial herb. Blooms May-Jun	Not Expected	Suitable redwood habitat is present, however this species was not observed during the appropriate blooming period.
Pentachaeta bellidiflora white-rayed pentachaeta	FE/CE G1/S1 1B.1 SB_UCBG-UC Botanical Garden at Berkeley	Cismontane woodland, Valley and foothill grassland (often serpentinite). 35 - 620 m. annual herb. Blooms Mar-May	Not Expected	Suitable habitat is not present.
Pinus radiata Monterey pine	None/None G1/S1 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz	Closed-cone coniferous forest, Cismontane woodland. 25 - 185 m. perennial evergreen tree. Blooms	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Piperia candida white-flowered rein orchid	None/None G3/S3 1B.2 BLM_S-Sensitive	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest. sometimes serpentinite. 30 - 1310 m. perennial herb. Blooms (Mar)May-Sep	Not Expected	Suitable redwood habitat is present, however serpentine soils are not and this species was not observed during the appropriate blooming period.
Plagiobothrys chorisianus var. *chorisianus* Choris' popcornflower	None/None G3T1Q/S1 1B.2 SB_UCSC-UC Santa Cruz	Chaparral, Coastal prairie, Coastal scrub. mesic. 3 - 160 m. annual herb. Blooms Mar-Jun	Not Expected	Suitable habitat is not present.
Plagiobothrys diffusus San Francisco popcornflower	None/CE G1Q/S1 1B.1 SB_UCSC-UC Santa Cruz	Coastal prairie, Valley and foothill grassland. 60 - 360 m. annual herb. Blooms Mar-Jun	Not Expected	Suitable habitat is not present.
Plagiobothrys glaber hairless popcornflower	None/None GH/SH 1A	Meadows and seeps (alkaline), Marshes and swamps (coastal salt). 15 - 180 m. annual herb. Blooms Mar-May	Not Expected	Suitable habitat is not present.
Polygonum hickmanii Scotts Valley polygonum	FE/CE G1/S1 1B.1	Valley and foothill grassland (mudstone and sandstone). 210 - 250 m. annual herb. Blooms May-Aug	Not Expected	Suitable habitat is not present.
Sanicula saxatilis rock sanicle	None/CR G2/S2 1B.2 BLM_S-Sensitive	Broadleafed upland forest, Chaparral, Valley and foothill grassland. rocky, scree, talus. 620 - 1175 m. perennial herb. Blooms Apr-May	Not Expected	Suitable habitat is not present.
Senecio aphanactis chaparral ragwort	None/None G3/S2 2B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub. sometimes alkaline. 15 - 800 m. annual herb. Blooms Jan-Apr(May)	Not Expected	Suitable habitat is not present.
Silene verecunda ssp. *verecunda* San Francisco campion	None/None G5T1/S1 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz	Coastal bluff scrub, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland. sandy. 30 - 645 m. perennial herb. Blooms July	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Stebbinsoseris decipiens Santa Cruz microseris	None/None G2/S2 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCSC-UC Santa Cruz	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland. open areas, sometimes serpentinite. 10 - 500 m. annual herb. Blooms Apr-May	Not Expected	Suitable habitat is not present.
Streptanthus albidus ssp. *albidus* Metcalf Canyon jewelflower	FE/None G2T1/S1 1B.1 BLM_S-Sensitive | SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBG-UC Botanical Garden at Berkeley	Valley and foothill grassland (serpentinite). 45 - 800 m. annual herb. Blooms Apr-Jul	Not Expected	Suitable habitat is not present.
Streptanthus albidus ssp. *peramoenus* most beautiful jewelflower	None/None G2T2/S2 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden | SB_UCBG-UC Botanical Garden at Berkeley | USFS_S-Sensitive	Chaparral, Cismontane woodland, Valley and foothill grassland. serpentinite. 95 - 1000 m. annual herb. Blooms (Mar)Apr-Sep(Oct)	Not Expected	Suitable habitat is not present.
Trifolium buckwestiorum Santa Cruz clover	None/None G2/S2 1B.1 BLM_S-Sensitive | SB_SBBG-Santa Barbara Botanic Garden | SB_UCSC-UC Santa Cruz | SB_USDA-US Dept of Agriculture	Broadleafed upland forest, Cismontane woodland, Coastal prairie. gravelly, margins. 105 - 610 m. annual herb. Blooms Apr-Oct	Not Expected	Suitable habitat is not present.
Trifolium polyodon Pacific Grove clover	None/CR G1/S1 1B.1 BLM_S-Sensitive | SB_USDA-US Dept of Agriculture	Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Valley and foothill grassland. mesic, sometimes granitic. 5 - 425 m. annual herb. Blooms Apr-Jun(Jul)	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale

Regional Vicinity refers to within a 9-quad search radius of site.

FE = Federally Endangered FT = Federally Threatened FC = Federal Candidate Species

SE = State Endangered ST = State Threatened SC = State Candidate SR = State Rare

CRPR (CNPS California Rare Plant Rank):

1A=Presumed Extinct in California

1B=Rare, Threatened, or Endangered in California and elsewhere

2A=Plants presumed extirpated in California, but more common elsewhere

2B=Plants Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension:

.1=Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2=Fairly endangered in California (20-80% occurrences threatened)

.3=Not very endangered in California (<20% of occurrences threatened)

Special Status Animal Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Invertebrates				
Bombus occidentalis western bumble bee	None/Candidate Endangered G2G3/S1 USFS_S-Sensitive | XERCES_IM-Imperiled	Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.	Low Potential	Flowering plants are present, and the site is within this species known range.
Cicindela ohlone Ohlone tiger beetle	Endangered/None G1/S1	Remnant native grasslands with California oatgrass & purple needlegrass in Santa Cruz County. Substrate is poorly-drained clay or sandy clay soil over bedrock of Santa Cruz mudstone.	Not Expected	Suitable habitat is not present.
Danaus plexippus pop. 1 monarch - California overwintering population	None/None G4T2T3/S2S3 USFS_S-Sensitive	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind and frost-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	Not Expected	Suitable frost protected habitat is not present.
Euphilotes enoptes smithi Smith's blue butterfly	Endangered/None G5T1T2/S1S2 XERCES_CI-Critically Imperiled	Most commonly associated with coastal dunes & coastal sage scrub plant communities in Monterey & Santa Cruz counties. Hostplant: *Eriogonum latifolium* and *Eriogonum parvifolium* are utilized as both larval and adult foodplants.	Not Expected	Suitable habitat is not present.
Polyphylla barbata Mount Hermon (=barbate) June beetle	Endangered/None G1/S1	Known only from sand hills in vicinity of Mt. Hermon, Santa Cruz County.	Not Expected	Suitable habitat is not present.
Trimerotropis infantilis Zayante band-winged grasshopper	Endangered/None G1/S1 IUCN_EN-Endangered	Isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem). Mostly on sand parkland habitat but also in areas with well-developed ground cover & in sparse chaparral with grass.	Not Expected	Suitable habitat is not present.
Fish				
Eucyclogobius newberryi tidewater goby	Endangered/None G3/S3 AFS_EN-Endangered |	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	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
	CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	reaches, they need fairly still but not stagnant water and high oxygen levels.		
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	Endangered/Endangered G4/S2? AFS_EN-Endangered	Federal listing = pops between Punta Gorda & San Lorenzo River. State listing = pops south of Punta Gorda. Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water & sufficient dissolved oxygen.	Not Expected	Suitable habitat is not present.
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	Threatened/None G5T2T3Q/S2S3 AFS_TH-Threatened	DPS includes all naturally spawned populations of steelhead (and their progeny) in streams from the Russian River to Aptos Creek, Santa Cruz County, California (inclusive). Also includes the drainages of San Francisco and San Pablo Bays.	Not Expected	Suitable habitat is not present.
Thaleichthys pacificus eulachon	Threatened/None G5/S3	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.	Not Expected	Suitable habitat is not present.
Reptiles				
Emys marmorata western pond turtle	None/None G3G4/S3 BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	Not Expected	Suitable habitat is not present.
Amphibians				
Ambystoma californiense California tiger salamander	Threatened/Threatened G2G3/S2S3 CDFW_WL-Watch List | IUCN_VU-Vulnerable	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	Endangered/Endangered G5T1T2/S1S2 CDFW_FP-Fully Protected	Wet meadows near sea level in a few restricted locales in Santa Cruz and Monterey counties. Aquatic larvae prefer shallow (<12 inches) water, using clumps of vegetation or debris for cover. Adults use mammal burrows.	Not Expected	Suitable habitat is not present.
Aneides niger Santa Cruz black salamander	None/None G3/S3 CDFW_SSC-Species of Special Concern	Mixed deciduous and coniferous woodlands and coastal grasslands in San Mateo, Santa Cruz, and Santa Clara counties. Adults found under rocks, talus, and damp woody debris.	Moderate Potential	Suitable redwood habitat is present and this species is known to occur in the Santa Cruz Mountains.
Dicamptodon ensatus California giant salamander	None/None G3/S2S3 CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened	Known from wet coastal forests near streams and seeps from Mendocino County south to Monterey County, and east to Napa County. Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	Low Potential	Suitable redwood habitat is present and this species is known to occur in the Santa Cruz Mountains, however the site is not adjacent to aquatic habitat.
Rana boylii foothill yellow-legged frog	None/Candidate Threatened G3/S3 BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | USFS_S-Sensitive	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	Not Expected	Suitable habitat is not present.
Rana draytonii California red-legged frog	Threatened/None G2G3/S2S3 CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Not Expected	Suitable habitat is not present, and there are no known occurrences in the vicinity of the site.
Birds				
Accipiter cooperii Cooper's hawk	None/None G5/S4 CDFW_WL-Watch List | IUCN_LC-Least Concern	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	Low Potential	Suitable nest trees are present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Agelaius tricolor tricolored blackbird	None/Threatened G2G3/S1S2 BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Not Expected	Suitable habitat is not present.
Aquila chrysaetos golden eagle	None/None G5/S3 BLM_S-Sensitive | CDF_S-Sensitive | CDFW_FP-Fully Protected | CDFW_WL-Watch List | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Not Expected	Suitable nest trees are present, but the site is surrounded by residential development.
Athene cunicularia burrowing owl	None/None G4/S3 BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Not Expected	Suitable habitat is not present.
Brachyramphus marmoratus marbled murrelet	Threatened/Endangered G3G4/S1 CDF_S-Sensitive | IUCN_EN-Endangered | NABCI_RWL-Red Watch List	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	Low Potential	Suitable old-growth redwood habitat is not present, however the site is within this species known range.
Charadrius alexandrinus nivosus western snowy plover	Threatened/None G3T3/S2S3 CDFW_SSC-Species of Special	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
	Concern | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern			
Coturnicops noveboracensis yellow rail	None/None G4/S1S2 CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | NABCI_RWL-Red Watch List | USFS_S-Sensitive | USFWS_BCC-Birds of Conservation Concern	Summer resident in eastern Sierra Nevada in Mono County. Freshwater marshlands.	Not Expected	Suitable habitat is not present.
Cypseloides niger black swift	None/None G4/S2 CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | NABCI_YWL-Yellow Watch List | USFWS_BCC-Birds of Conservation Concern	Coastal belt of Santa Cruz and Monterey counties; central & southern Sierra Nevada; San Bernardino & San Jacinto mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	Not Expected	Suitable habitat is not present.
Elanus leucurus white-tailed kite	None/None G5/S3S4 BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Low Potential	Suitable nest trees are present.
Falco peregrinus anatum American peregrine falcon	Delisted/Delisted G4T4/S3S4 CDF_S-Sensitive | CDFW_FP-Fully Protected | USFWS_BCC-Birds of Conservation Concern	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Not Expected	Suitable habitat is not present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Geothlypis trichas sinuosa saltmarsh common yellowthroat	None/None G5T3/S3 CDFW_SSC-Species of Special Concern | USFWS_BCC-Birds of Conservation Concern	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	Not Expected	Suitable habitat is not present.
Laterallus jamaicensis coturniculus California black rail	None/Threatened G3G4T1/S1 BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_NT-Near Threatened | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	Not Expected	Suitable habitat is not present.
Pandion haliaetus osprey	None/None G5/S4 CDF_S-Sensitive | CDFW_WL-Watch List | IUCN_LC-Least Concern	Ocean shore, bays, freshwater lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	Not Expected	Suitable nest trees are present, but the site is surrounded by residential development.
Progne subis purple martin	None/None G5/S3 CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly; also in human-made structures. Nest often located in tall, isolated tree/snag.	Not Expected	Suitable habitat is not present.
Riparia riparia bank swallow	None/Threatened G5/S2 BLM_S-Sensitive | IUCN_LC-Least Concern	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Not Expected	Suitable habitat is not present.
Mammals				
Antrozous pallidus pallid bat	None/None G5/S3 BLM_S-Sensitive | CDFW_SSC-Species of Special Concern |	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very	Low Potential	Suitable roost trees are present, but the site is surrounded by residential development.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
	IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	sensitive to disturbance of roosting sites.		
Corynorhinus townsendii Townsend's big-eared bat	None/None G3G4/S2 BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Low Potential	Suitable roost trees are present, but the site is surrounded by residential development.
Lasiurus cinereus hoary bat	None/None G5/S4 IUCN_LC-Least Concern | WBWG_M-Medium Priority	Prefers open 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. Requires water.	Low Potential	Suitable roost trees are present, but the site is surrounded by residential development.
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	None/None G5T2T3/S2S3 CDFW_SSC-Species of Special Concern	Forest habitats of moderate canopy & moderate to dense understory. May prefer chaparral & redwood habitats. Constructs nests of shredded grass, leaves & other material. May be limited by availability of nest-building materials.	Not Expected	Suitable habitat is not present.
Taxidea taxus American badger	None/None G5/S3 CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Not Expected	Suitable habitat is not present.

Regional Vicinity refers to within a 9-quad search radius of site.

FE = Federally Endangered FT = Federally Threatened FC = Federal Candidate Species FS=Federally Sensitive

SE = State Endangered ST = State Threatened SC = State Candidate SS=State Sensitive

SSC = CDFW Species of Special Concern SFP = State Fully Protected

Appendix C

Cultural Resources Assessment

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June 9, 2020
Project No: 20-09468

Carly Blanchard, Environmental Planner
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, California 95006
Via Email: cblanchard@slvwd.com

Subject: Cultural Resources Assessment for the Redwood Park Tanks Project, Ben Lomond, Santa Cruz County, California

Dear Ms. Blanchard:

Rincon Consultants, Inc. (Rincon) was retained by the San Lorenzo Valley Water District (SLVWD) to prepare an updated cultural resources study in support of an Initial Study and Mitigated Negative Declaration for the Redwood Park Tank Project (project). SLVWD will be retiring two aging and leaking 20,000-gallon water storage tanks, referred to as the "Swim Water Storage Tanks." Consequently, SLVWD needs new water storage infrastructure to support the North Service Area, which includes the unincorporated communities of Boulder Creek, Brookdale, and Ben Lomond. The Redwood Park Tank Project consists of the construction and operation of a new tank approximately 400 feet from the existing Swim Water Storage Tanks.

Rincon prepared a complete cultural resources technical report for the project in 2018 for the Swim Water Storage Tank Project (Haas et al. 2018). This memorandum utilizes data from the Swim Water Storage Tanks cultural resources study and presents the results of a field survey of the new proposed tank site. All work was completed in compliance with California Environmental Quality Act (CEQA). The District is the lead agency under CEQA.

Project Description

The project consists of the construction and operation of a new 125,000-gallon bolted steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. Figure 2 depicts the project site.

The project site is currently undeveloped. On the eastern side of the site, a cut slope descends to Dundee Avenue. A wooden fence stands approximately three feet north of the proposed tank location. The proposed footprint of the new 30-foot diameter water tank is clear of trees and thickly vegetated with ivy. A grove of native coast redwood and mixed hardwood species is located approximately 18 feet south of the proposed tank location.

The proposed project would require the removal of five trees: one small, suppressed coast redwood and four tanbark oak trees. Dead trees, branches, and secondary trunks would also be removed from the

existing grove to improve grove health. The project would also involve post-construction revegetation of the site with five fruit and nut trees and three blackberry bushes.

The project would construct the following infrastructure at the project site:

- 125,000-gallon bolted steel water storage tank (30 feet in diameter, 24 feet in height)
- Two water pumps, housed in an 80 square-foot pumping station made from concrete masonry and fire-resistant roofing
- Baserock surfaced or paved driveway
- 400 linear feet of 8-inch high-density polyethylene (HDPE) water pipeline connecting the project site to the "Swim Water Storage Tanks" site on Country Club Drive
- Standby backup generator and propane tank for emergency power

Cultural Resources Records Search

A search of the California Historical Resources Information System (CHRIS) at the Northwest Information Center (NWIC) located at Sonoma State University was completed for the Swim Tank Project on July 5, 2018. The search was performed to identify all previously recorded cultural resources, as well as previously conducted cultural resources studies within the original project site and a 0.5-mile radius surrounding it; the 0.5-mile radius includes the new tank site. The CHRIS search included a review of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the Office of Historic Preservation Historic Properties Directory, the California Inventory of Historic Resources, and the Archaeological Determinations of Eligibility list. The following summarizes the results as they pertain to the current project.

The NWIC records search identified four previous studies within a 0.5-mile radius of the project site, none of which are in the project site (Table 1). The National Archaeological Database listings for these studies are included with the records search summary in Attachment A.

Table 1 Previous Cultural Resources Studies within 0.5 mile of the Project Site

Report Number	Author	Year	Title	Relationship to Project Site
S-003916	Cartier, R.	1977	*Archeological Evaluation of the Proposed Land Division for Parcel APN 78-171-48, Santa Cruz County*	Outside
S-024645	Hildreth, J.	2000	*Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California, Mason Creek, THP # 1-00-247 SCR (California Department of Forestry)*	Outside
S-028809	Clark, M.R.	2004	*An Archaeological Reconnaissance of the Proposed San Lorenzo Valley Trail Alignment Alternatives, Boulder Creek-Santa Cruz, Santa Cruz County, California*	Outside
S-047860	Lehmann, S.	1995	*County of Santa Cruz, Survey of Historic Resources, Additions - 1995*	Outside

APE: Area of Potential Effects
Source: NWIC 2018

The NWIC records search identified two previously recorded cultural resources within a 0.5-mile radius of the project site, neither of which is located in the project site. A summary of the previously recorded resources can be seen in Table 2 below.

Table 2 Previously Recorded Cultural Resources within a 0.5-Mile Radius of the Project Site

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status
P-44-000401	CA-SCR-329H	Historic road	State Highway 9	J. Berg and S. Mikesell 1999	Not evaluated
P-44-001015	N/A	Historic building	Alice Wilder House; single-family residence	S. Lehmann 1995	Locally listed

NRHP: National Register of Historic Places; CRHR: California Register of Historical Resources; APE: Area of Potential Effects
Source: NWIC 2018

Native American Scoping

The following summarizes Native American outreach conducted for the Swim Tank Project cultural resources study. Because the current project location falls in close proximity to and within the same township, range, and section as the original tank site, and because the Swim Tank Project originally included the construction of a new water storage tank which would be superseded by the Redwood Tank Project, Rincon did not conduct new outreach for the current project.

As part of the process of identifying cultural resources in or near the Swim Tank project site, Rincon contacted the Native American Heritage Commission (NAHC) to request a review of the Sacred Lands File (SLF) for the project. Rincon received the results from the NAHC on July 6, 2018, which stated that the SLF request produced negative results. SLF results are based on Public Lands Survey System information for a particular location, therefore it can be assumed that there are no sacred lands within the current project site. Outreach to Native American contacts conducted for the Swim Tank Project did not identify any cultural resources in the general vicinity.

Attachment B provides documentation of communication with the NAHC and Native American scoping.

Field Survey

Rincon Archaeologist Elaine Foster conducted a pedestrian survey of the proposed project site on May 21, 2020. Ms. Foster surveyed the parcel and side road that contains the project site using transects spaced no more than 10 meters apart. The survey transects were oriented generally in an east-west direction. Ms. Foster examined exposed ground surface for the following: artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, ceramics, fire-affected rock), ecofacts (marine shell and bone), soil discoloration that might indicate the presence of a cultural midden, soil depressions, and features indicative of the former presence of structures or buildings (e.g., standing exterior walls, postholes, foundations) or historic debris (e.g., metal, glass, ceramics). Ground disturbances such as burrows and drainages were inspected visually. Field notes of survey conditions and observations were recorded using Rincon field forms and a digital camera. Copies of the original field notes and photographs are maintained at Rincon's Monterey office.

Rincon did not identify any evidence of archaeological or built-environment resources within the project site. Ground visibility was poor (10 %) with vegetation consisting of dense areas of ivy and poison oak, bushes, and a grouping of trees, which covered areas of the ground surface in leaves (Figure 3). Modern disturbances on the project site include scarcely scattered refuse (Figure 4) and a paved road (Figure 5). Refuse included but was not limited to glass fragments and one cut bone (see Figure 6 through Figure 8). Surface sediments consist of a dark brown sandy loam.

Findings and Recommendations

The results of the study identified no cultural resources on the proposed tank site. The existing redwood tanks were previously evaluated as ineligible for the NRHP and CRHR and therefore do not qualify as historical resources under CEQA. No other built environment resources are located within or near the project site. The CHRIS records search did not identify any archaeological resources in the vicinity of the project site. The SLF search results were negative and Native American scoping did not indicate that any known resources are located within or near the project site. The pedestrian field survey was negative for the presence of archaeological remains. Therefore, the results of this study suggest that the proposed tank site exhibits a low sensitivity for containing intact, subsurface archaeological deposits.

Based on these findings, Rincon recommends a finding of ***no impact to historical resources*** and ***less than significant impact with mitigation for archaeological resources*** under CEQA.

Rincon presents the following measures in case of unanticipated discovery of cultural resources during project development. The project is also required to adhere to regulations regarding the unanticipated discovery of human remains, detailed below.

Worker's Environmental Awareness Program

A qualified archaeologist shall be retained to conduct a Worker's Environmental Awareness Program training for archaeological sensitivity for all construction personnel prior to the commencement of any ground disturbing activities. Archaeological sensitivity training should include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find.

Unanticipated Discovery of Archaeological Resources

If archaeological resources are encountered during ground-disturbing activities, work in the immediate area should be halted and an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service 1983) should be contacted immediately to evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for CRHR eligibility. If the discovery proves to be significant under CEQA and cannot be avoided by the project, additional work, such as data recovery excavation, may be warranted to mitigate any significant impacts to historical resources.

Unanticipated Discovery of Human Remains

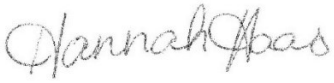
The discovery of human remains is always a possibility during ground-disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of

human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site and provide recommendations for treatment to the landowner within 48 hours of being granted access.

Please do not hesitate to contact Rincon with any questions regarding this archaeological study.

Sincerely,

Rincon Consultants, Inc.



Hannah Haas, M.A., RPA
Senior Archaeologist

Christopher Duran, M.A., RPA
Principal/Senior Archaeologist

Elaine Foster, B.A.
Associate Archaeologist

Attachments

Attachment A Figures

Attachment B CHRIS Records Search Results Summary

Attachment C NAHC SLF Results

References

Haas, Hannah, Steven Treffers, James Williams, Rachel Perzel, and Christopher Duran

2018 San Lorenzo Valley Water District Swim Tank Project, California. Rincon Consultants Project No. 18-06158. Report on file at the Northwest Information Center, Sonoma State University.

National Park Service (NPS)

1983 Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. Electronic document accessed December 27, 2019. Online at http://www.nps.gov/history/local-law/Arch_Standards.htm.

Appendix A

Figures

Figure 1 Regional Location

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Project Location

N

Figure 2 Project Location

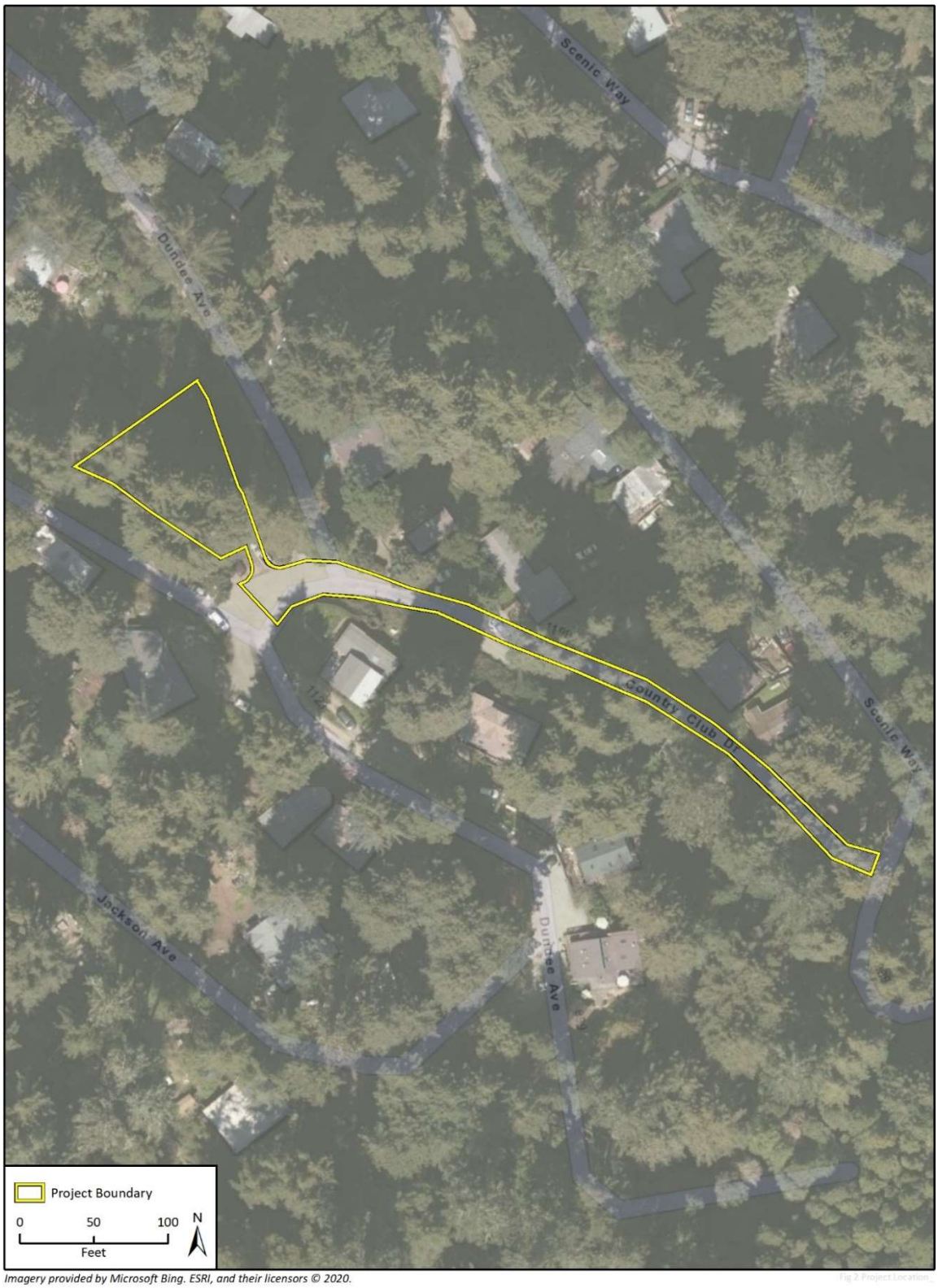

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Figure 3 Project Site Facing West

Figure 4 Modern Debris

Figure 5 Country Club Drive

Figure 6 Bone Fragment

Figure 7 Green Glass Fragment

Figure 8 Clear Glass Fragment

Attachment B

CHRIS Record Search Results Summary

Attachment C

NAHC SLF Results

Appendix D

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION
For
APN 078-233-05
SWIM TANK ALTERNATE SITE
Ben Lomond, California

Prepared For
SAN LORENZO VALLEY WATER DISTRICT
13060 Highway 9
Boulder Creek, California

Prepared By
HARO, KASUNICH AND ASSOCIATES, INC.
Geotechnical & Coastal Engineers
Project No. SC11681
August 2019

HARO, KASUNICH AND ASSOCIATES, INC.

CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. SC11681
30 August 2019

SAN LORENZO VALLEY WATER DISTRICT
13060 Highway 9
Boulder Creek, California 95006

Attention: Mr. Rick Rogers

Subject: Geotechnical Investigation

Reference: Replacement Swim Tank Alternate Site
Dundee Avenue and Country Club Drive
APN 078-233-05
Ben Lomond, California

Dear Mr. Rogers:

In accordance with your authorization, we have performed a Geotechnical Investigation at the referenced alternate site for the Swim Tank replacement project in Ben Lomond, California.

The accompanying report presents our conclusions and recommendations, as well as the results of the geotechnical investigation on which they are based.

If you have any questions concerning the data, conclusions and recommendations presented in this report, please call our office.

Respectfully Submitted,

HARO, KASUNICH AND ASSOCIATES, INC.

Ashton J. Buckner, E.I.T.
Staff Engineer

Christopher A. George
C.E. 50871

AJB/CAG/cag

Copies: 2 to Addressee + 1 via email (RRogers@slvwd.com)
1 pdf to Darren Langfield (dlangfield@slvwd.com)

Project No. SC11681
30 August 2019

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Project No. SC11681
30 August 2019

GEOTECHNICAL INVESTIGATION

Introduction

This report presents the findings, conclusions and recommendations of our Geotechnical Investigation for an alternate site for the proposed Swim Tank Replacement project in Ben Lomond, California. As shown on the Site Vicinity Map (see Figure 1 in Appendix A), the alternate site is located on a gently sloping parcel at the intersection of Dundee Avenue and Country Club Drive in Ben Lomond, California.

A Topographic Map for the alternate site, dated June, July 2019, and a Swim Tank Alternate Siting Study, dated June 2019, were provided for our use. Both maps were prepared by Paul Jensen. The Siting Study map, which depicts the locations of the proposed 30-foot diameter steel water tank, was projected onto the Topo Map, which depicts the slope contours of the site. The merged map was used as a base for our Boring Site Plan (see Figure 3 in Appendix A). Cross Section A-A' (see Figure 4 in Appendix A) was drawn based on contours shown on the topographic map.

Exploratory boring locations were not surveyed and should be considered approximate only. Site descriptions, elevations, slope gradients and distances referred to in this report are based on review of the topographic map and site visits by the engineer.

Foundation and grading plans for the replacement tank or improvements had not been developed at the time this report was prepared. Haro, Kasunich and Associates should be

provided an opportunity to review the project plans prior to finalizing to evaluate if the criteria and recommendations presented were properly interpreted and implemented and determine if this report is adequate and complete for proposed project.

Purpose and Scope

The purpose of our investigation was to evaluate the soil and bedrock conditions at the alternate tank site and develop geotechnical design criteria and recommendations for the proposed water tank foundation. It is presumed the most current California Building Code (CBC) edition design considerations, specifically the seismic factors and coefficients from Chapter 16, Volume II, will be followed during design and construction of the projects.

The specific scope of our services was as follows:

1. Site reconnaissance and review of available data in our files regarding the site and vicinity.

2. A field exploration program consisting of logging and interval sampling of soils encountered in three (3) exploratory borings drilled to depths of 26.5 to 31.5 feet. Standard Penetration Tests (SPT) were performed during sampling operations. The soil samples obtained were sealed and returned to the laboratory for testing.

3. Laboratory testing and classification of select samples obtained. Moisture

content and dry density tests were performed to evaluate the consistency of the in-situ soils. Gradation analysis was performed to aid in soil classification. Atterberg Limits tests were performed to evaluate the expansion potential of clay soil encountered in the course of our exploration. Unconfined compression tests were performed on selected samples to determine the in-situ strength properties of site soils.

4. Engineering analysis and evaluation of the resulting data. We developed geotechnical design parameters for foundations, concrete slabs-on-grade, retaining walls, and recommendations for site grading, drainage and erosion control. We also visually observed the soil and bedrock conditions in road cuts between the existing Swim Tank site and the Alternate site to evaluate the feasibility of installation of a 3-foot-deep waterline in the roadway between the sites.

5. Preparation and submittal of this report presenting the results of our investigation.

Site Locations and Conditions

The Alternate Swim Tank Site (APN 078-233-05) is a small (6534 square foot) undeveloped parcel located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The parcel is bordered on the west and south

by Country Club Drive, Dundee Avenue to the east, and a residence to the north.

The west third of the parcel slopes to the east at a gradient of about 35 percent. Within the proposed location of the tank, the site slopes toward Dundee Avenue to the east at gradients of 20 to 5 percent. On the eastside of the parcel, a 3 foot high (±) cut slope descends to Dundee Avenue. A wooden fence stands about 3 feet north of the proposed tank site. The proposed footprint of the new 30-foot diameter water tank is clear of trees and thickly vegetated with ivy. A redwood grove about 18 feet south of the proposed tank has numerous 16 to 38 inch diameter trees.

Pipeline Alignment

The current Swim Tank site is approximately 400 feet southeast of the alternate site with an elevation loss of about 70 feet between the sites. Along the left-hand side of Country Club Drive, traveling from the existing Swim Tank site to the Alternate site, there is approximately 30 feet of stiff weathered siltstone bedrock visible in the slope cut (See Figure 5 in Appendix A). A review of our exploratory boring logs for the original site indicates the stiff weathered siltstone was found from depths of 2 feet to depths of 13 to 16.5 feet in the borings. In Boring 3, located at elevation 738 feet, very hard Monterey Formation siltstone bedrock (67 blows/12 inches) was found at a depth of 13 feet (elevation 725 feet) in Boring 3. On Woodland Drive and Country Club Dive, below the current Swim Tank site, the road elevation is 714 feet and rises to elevation 775 feet south of the alternate site. Depending on the strike and dip of hard bedrock, there is potential for

encountering hard siltstone in the pipeline trench where the trench elevation is below elevation 725 feet and excavation may be difficult. Excavation in the weathered siltstone such as is exposed in the road cut should not present problems.

Project Description

A new 30-foot diameter steel water storage tank is proposed at the alternate swim tank site to replace the existing redwood tanks at the end of Country Club Drive. A reinforced concrete ring foundation on a graded cut and fill building pad is anticipated for the new 30-foot diameter and 24-foot-high bolted steel tank. Vegetation and roots will be cut back and removed from the building area. The project will also include the construction of a baserock surfaced or paved driveway.

Grading for the project will consist of cut and fill grading to construct a level pad for the tank and apron and re-densification of near surface soil under the tank pad, excavations for ring footings, and compaction of subgrade soil and baserock for the driveway. A retaining wall may be constructed upslope of the tank to provide access around the tank.

Field Exploration

Subsurface conditions were investigated on 16 July 2019 by drilling three (3) exploratory borings to depths of 26.5 and 31.5 feet. The boring locations were not surveyed and should be considered approximate only. The borings were drilled with 4-inch diameter, continuous flight auger equipment mounted on a motor driven limited access drill rig. The approximate

locations of the borings are shown on the Boring Site Plan (Figure No. 3 in Appendix A).

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using a 3.0 inch outside diameter (O.D.) Modified California Sampler (L), or by a 2.0-inch O. D. Standard Terzaghi Sampler (T). The soils encountered in the borings were continuously logged in the field and visually described in accordance with the Unified Soil Classification System (ASTM D2487). The Logs of Test Borings are included in the Appendix of this report. The Logs depict subsurface conditions at the approximate locations shown on the Boring Site Plans. Subsurface conditions at other locations may differ from those encountered at the explored locations. Stratification lines shown on the logs represent the approximate boundaries between soil types; actual transitions may be gradual.

The penetration blow counts noted on the boring logs were obtained by driving a sampler into the soil with a 140-pound hammer dropping through a 30-inch fall. The sampler was driven up to 18 inches into the soil and the number of blows counted for each 6-inch penetration interval (Standard Penetration Test). The numbers indicated on the logs are the total number of blows that were recorded for the second and third 6-inch intervals, or the blows that were required to drive the penetration depth shown if high resistance was encountered.

Subsurface Conditions

Based on the results of our subsurface exploration, the Alternate Swim Tank site is underlain by compressible firm sandy silt topsoil and lean clay from the surface to depths of 2 to 2½ feet. Below the topsoil, stiff to very stiff sandy silty lean clay was found to a depth of 15 feet in Boring 2 and stiff to very stiff sandy silt and siltstone was found to a depth of 20 feet in Boring Nos. 1 and 3. Stiff weathered siltstone and hard siltstone was encountered from 15 or 20 feet to the depth explored in B-1 (31.5 feet), B-2 (26.5 feet) and B-3 (26.5 feet).

A review of "The Geologic Map of Santa Cruz County, California" (Brabb, 1989) indicates that the site is mapped as Tm: Monterey Formation (middle Miocene) - Medium to thick-bedded and laminated olive-gray to light gray semi-siliceous organic mudstone and sandy siltstone. Includes a few thick dolomite interbeds. Thickness about 2,675 feet on north limb of Scotts Valley syncline (Clark, 1981, p.21).

The weathered siltstone and clayey siltstone and hard siltstone encountered in our borings is typical of the Monterey Formation mudstone and siltstone.

Groundwater

Groundwater was not encountered in our borings. However, groundwater levels will fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, and climate conditions as well as other factors. Therefore, water observations at the time of the

field investigation may vary from those encountered during the construction phase and/or post-construction of the project. The evaluation of such factors is beyond the scope of our study.

Laboratory Testing

The laboratory testing program was directed toward determining pertinent engineering and index soil properties.

The natural moisture contents and dry densities were determined on selected samples and are recorded on the boring logs at the appropriate depths. Since the engineering behavior of soil is affected by changes in moisture content, the natural moisture content will aid in evaluation of soil compressibility, strength, and potential expansion characteristics. Soil dry density and moisture content are index properties necessary for calculation of earth pressures on engineering structures. The soil dry density is also related to soil strength and permeability.

Atterberg Limits tests were performed on selected soil samples to evaluate the range of moisture contents over which the soil exhibits plasticity, and to classify the soil according to the Unified Soil Classification System. The plasticity characteristics of a soil give an indication of the soil's compressibility and expansion potential. Grain size analysis tests were performed to aid in soil classification. The results of Atterberg Limits tests (PI=18 and PI=20, respectively) and Grain size analysis tests indicate the soils from depths of 2.5 feet

to 4.0 feet in Boring 2 and Boring 3 at the Alternate Swim Tank Site are classified as lean clay (CL).

The strength parameters of the underlying earth materials were determined from an Unconfined Compression Test performed in the laboratory and from Standard Penetration Test (SPT) blow count measurements obtained in the field during sampling of in-situ soil. The results of the field and laboratory testing appear on the "Logs of Test Boring" opposite the sample tested.

Seismicity

The following is a general discussion of seismic considerations affecting the project area. Detailed studies of seismicity, faulting and other geologic hazards are beyond the scope of this study.

The Swim Tanks site is located at Latitude 37.081638° North and Longitude 122.093787° West (Google Earth). The active San Andreas Fault Zone and the potentially active Zayante Fault Zone and Ben Lomond Fault are located about 6.8 miles, 2.5 miles, and 0.3 miles from the project site, respectively.

The San Andreas Fault zone is a major fault zone of active displacement which extends from the Gulf of California to the vicinity of Point Arena, where the fault leaves the California coastline. Between these points, the fault is about 700 miles long. The fault

zone is a break or series of breaks along the earth's crust, where shearing movement has taken place. This fault movement is primarily horizontal.

The largest historic earthquake in Northern California occurred on 18 April 1906 (M8.3+). The 17 October 1989 Loma Prieta earthquake (M6.9) is also considered to have been associated with the San Andreas Fault system. This event was the second largest earthquake in Northern California this century. Strong ground shaking was experienced throughout Santa Cruz County during both of these seismic events.

Although research on earthquake prediction has greatly increased in recent years, seismologists have not yet reached the point where they can predict when and where another large earthquake will occur. Nevertheless, on the basis of current technology, it is reasonable to assume that the proposed development will be subject to at least one moderate to severe earthquake during the fifty-year period following construction.

Potential seismic hazards include surface ground rupture, liquefaction effects, damage from strong seismic shaking, and landsliding.

Since no known faults cross the project site, the potential for surface ground rupture is low. Because of the stiff to very stiff consistency of the weathered siltstone and clayey siltstone and hard siltstone underlying the Swim Tanks site, the potential for seismic induced liquefaction at the site is low. During a major earthquake there is potential for severe

ground shaking at this site. In our opinion, structures designed in accordance with the most current California Building Code (2013 CBC) should perform adequately during strong seismic shaking.

Slope Stability

During our field investigation and site reconnaissance, we did not observe any visual indications of instability of the relatively gentle natural slopes at the alternate tank site. A review of the Preliminary Map of Landslide Deposits in Santa Cruz County (Cooper-Clark, 1974) indicates the site is an area mapped as a large probable landslide deposit of about 450 acres (±) in size. The mapped landslide deposit encompasses hundreds of occupied parcels. We have reviewed a geologic report in our files for another property within the suspected landslide deposit. The geologist noted that the deposit was not mapped on a regional geologic map. In an examination of stereo aerial photographs, he concluded there was no evidence in the aerial photographs to support the existence of the landslide, notably the absence of a landslide headscarp.

As we noted above, we did not observe any indications of instability on the site nor did conditions encountered in our borings indicate potential instability. However, a quantitative analysis of the static and seismic stability of the site and large landslide is beyond the scope of work detailed in our proposal agreement.

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our investigation, the proposed construction of a water tank on the Alternate Swim Tank Site is acceptable from a geotechnical standpoint, provided the following geotechnical criteria and recommendations are incorporated into the design and construction of the project.

Geotechnical considerations at the Alternate Swim Tank Site include the presence of firm to stiff compressible near surface soil, providing firm uniform bearing support for the new water tank foundations, the potential for strong seismic shaking, and providing adequate site drainage.

Based on our subsurface exploration and testing, the near surface soil at the tank site consists of firm to stiff sandy silt and lean clay topsoil, stiff to very stiff weathered siltstone and clayey siltstone of variable strength. Test results indicate the soil contains 80 percent fines (clay and silt). The fine-grained soils are moderately expansive, difficult to compact and unsuitable for use as structural fill. To provide firm uniform support for the replacement water tank, we recommend the top 3 feet of soil at the site be sub-excavated, removed off site and replaced with select non-expansive engineered fill. In addition, there should be a minimum of 3 feet of engineered fill below the bottom of the ring foundation.

Concentrated surface runoff from the project site should not be allowed to flow onto the

slopes at the site. We recommend roof and surface runoff be directed to collection facilities and conveyed to the paved road downslope of the Alternate Swim Tank site.

The project site is located within a seismically active area. The proposed water tank should be designed in accordance with the most current CBC (2016) seismic design standards.

The following recommendations should be used as guidelines for preparing project plans and specifications.

Site Grading

1. The geotechnical engineer should be notified **at least four (4) working days prior to any grading or foundation excavating** so the work in the field can be coordinated with the grading contractor and arrangements for testing and observation can be made. The recommendations of this report are based on the assumption that the geotechnical engineer or representative will perform the required testing and observation during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.

3. Near surface soil on the tank site should be removed and replaced with select non-expansive engineered fill where foundations and improvements are planned. We estimate the top 3 feet of soil of the tank pad area will need to be sub-excavated and removed offsite and replaced with select non-expansive engineered fill. In addition, there should be a minimum of 3 feet of engineered fill below the bottom of footings. The sub-excavation should extend a minimum of 5 feet beyond foundation perimeters. The geotechnical engineer should evaluate site conditions during initial grading to confirm that loose soil has been removed and the required depth of sub-excavation was achieved.

4. Areas to be graded should be cleared of all obstructions, including existing foundations and structures, old fill, trees not designated to remain and other unsuitable material. Disturbed soil resulting from removal of roots, stumps and clearing operations should be removed off site. Existing depressions or voids created during site clearing should be backfilled with engineered fill.

5. The remaining cleared areas should then be stripped of organic-laden topsoil. Stripping depth is anticipated to be from 4 to 6 inches. Actual depth of stripping should be determined in the field by the geotechnical engineer. Strippings should be wasted off-site or stockpiled for use in landscaped areas if desired.

6. Following clearing and stripping, the bottom of the subexcavation and all areas to receive fill should be scarified, moisture conditioned (or allowed to dry as necessary) to

produce a moisture content 3 to 5 percent over laboratory optimum value, and uniformly compacted to a minimum of 90 percent relative compaction based on ASTM Test D1557-10. The required depth of sub-excavation should be confirmed in the field by the engineer during grading.

7. If grading is performed during or shortly after the rainy season, the grading contractor may encounter compaction difficulty, such as pumping or bringing free water to the surface in the near surface soils. If compaction cannot be achieved after reducing the soil moisture content, it may be necessary to overexcavate the subgrade soil and replace it with angular crushed rock to stabilize the subgrade. The need for ground stabilization measures to complete grading effectively should be determined in the field at the time of grading, based on exposed soil conditions.

8. Select non-expansive engineered fill should be placed in thin lifts not exceeding 8 inches in loose thickness, moisture conditioned, and compacted to a minimum of 95 percent relative compaction. The upper 6 inches of slab or pavement subgrade and aggregate base below pavements should also be compacted to a minimum of 95 percent relative compaction.

9. The on-site silt and clay soil is not acceptable for use as engineered fill. Soil imported for use as engineered fill should consist of a predominantly granular non-expansive soil, free of organic material conforming to the quality and gradation

requirements as follows:

1. Imported soil should be relatively and contain no rocks or clods greater than 4 inches in diameter, with no more than 15 percent larger than 2½ inches.
2. The material should be predominately granular with a liquid limit less than 35 and a plasticity index (PI) <12
3. No more than 35 percent should pass the No. 200 sieve
4. Engineered fill should have sufficient binder so that footing and utility trenches do not collapse.

10. We estimate shrinkage factors of 15 to 25 percent for imported materials when compacted as engineered fill.

Cut and Fill Slopes

11. Temporary excavations should be properly shored and braced during construction to prevent sloughing and caving at sidewalls. The contractor should be aware of all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

12. Permanent cut slopes should be inclined no steeper than 2:1 (horizontal to vertical). The top of all cut slopes should be rounded off to reduce soil sloughing. If seepage is observed, the geotechnical engineer should provide additional recommendations. Cut slopes with these recommended gradients may require periodic maintenance to remove minor soil sloughing.

13. Compacted fill slopes should be constructed at a slope inclination no steeper than 2:1 (horizontal to vertical). Fill slopes with this recommended gradient may require periodic maintenance to remove minor soil sloughing. All fills must be adequately benched into competent material. Keyways for stability are required at the toe of fill embankments. Toe keys should be at least 6 feet wide and should extend at least 1½ feet into competent soil or bedrock. The bottom of the toe key should be sloped downward at about 2 percent toward the back of the key. Where seepage is observed, keyways should have subdrains. The location of subdrains and outlets should be determined by the geotechnical engineer in the field during grading.

14. Following grading, exposed soil should be planted as soon as possible with erosion-resistant vegetation.

15. After the earthwork operations have been completed and the geotechnical engineer has finished his observation of the work, no further earthwork operations shall be performed without the direct observation and approval of the geotechnical engineer.

Spread Footing Foundations

16. The actual dimensions of the ring-type footings should be determined by the design professional. However, as a minimum, footings should be 15 inches in width, penetrate loose soil and be embedded a minimum of 18 inches into engineered fill. The footings

should be reinforced as required by the structural designer based on the actual loads transmitted to the foundations.

17. The bottom of all foundation elements should have a minimum setback of 5 feet horizontally from adjacent slopes.

18. The foundation trenches should be kept moist and be thoroughly cleaned of all slough or loose materials prior to pouring concrete. In addition, all footings located adjacent to other footings should have their bearing surfaces founded below an imaginary 1½:1 plane projected upward from the bottom edge of the adjacent footings or utility trenches.

19. Provided the water tank pad is redensified as recommended in the grading section of this report and the water tank and foundations are embedded in and underlain by redensified engineered fill, foundations may be designed for an allowable soil bearing pressure of 2500 psf for dead plus live loads. This value may be increased by one-third to include short-term seismic and wind loads.

20. Provided our recommendations are followed during design and construction of the project, post-construction total and differential settlement of foundations are expected to be less than 1 inch and ½ inch, respectively.

21. Lateral load resistance for the tank footings may be developed in friction between

the foundation bottom and the supporting engineered fill subgrade. A friction coefficient of 0.35 is considered applicable. An allowable passive pressure of 200 pcf may be used below a depth of 12 inches.

22. All footings should be reinforced in accordance with applicable CBC and/or ACI standards. We recommend the footings contain a minimum steel reinforcement of four (4) No. 4 bars; i.e., two near the top and two near the bottom of the footing.

23. The footing excavations should be thoroughly cleaned and observed by the geotechnical engineer prior to placing forms and steel, to verify subsurface soil conditions are consistent with the anticipated soil conditions and the footings are in accordance with our recommendations.

California Building Code Seismic Design

24. For CBC seismic design, the soil properties at the site are classified as **Site Class "D"** based on definitions presented in Chapter 20 of ASCE 7. The longitude and latitude were determined using a satellite image generated by Google Earth. These coordinates were taken from the approximate middle of the area of the proposed alternate tank site:

Longitude = 121.7625° West , Latitude = 36.9321° North

25. The coordinates listed were used as inputs in the OSHPD Seismic Design Maps created by California's Office of Statewide Health Planning and Development (OSHPD) to determine the ground motion associated with the maximum considered earthquake (MCE) S_M and the reduced ground motion for design S_D. The results are as follows:

Site Class D

SM_s= 1.5g (0.2- second period)

SM_1= 0.9g (1.0 - second period)

SD_s= 1.0g (0.2 - second period)

SD_1= 0.6g (1.0 - second period)

26. A maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA) was estimated using the OSHPD Seismic Design Maps. The mapped PGA was 0.512 g and the site coefficient F_{PGA} for Site Class D is 1.0. The MCE_G peak ground acceleration adjusted for Site Class effects is PGA_M = FPGA * PGA

$PGA_M = 1.0 * 0.512g = 0.512g$

Retaining Wall Lateral Pressures

27. Where retaining walls are designed for support of the cut or fill slopes, the walls should be designed to resist both lateral earth pressures and any additional surcharge loads. Spread footings may be used for walls provided there is a minimum of 5 feet horizontally from the foundation to adjacent slopes. Where retaining walls will be constructed on slopes steeper than 5:1, the wall should be founded on reinforced concrete piers. For design of fully drained retaining walls up to 10 feet high, the following design criteria may be used:

A. Active earth pressure for walls allowed to yield (up to ½ percent of wall height) is that exerted by an equivalent fluid weight of 45 pcf for a level backslope gradient and 60 pcf for a 2:1 (horizontal to vertical) backslope gradient. **This**

assumes a fully drained condition.

B. Where walls are restrained from moving at the top, design for a uniform rectangular distribution equivalent to 30H psf per foot of wall height for a level backslope, and 39H psf per foot of wall height for a 2:1 backslope (where H is the height of the wall).

C. In addition, the walls should be designed for any adjacent surcharge loads which will exert a force on the wall.

D. For retaining walls founded on spread footings embedded in firm native soil, use an allowable bearing pressure of 1200 psf plus a one-third increase for short term wind and seismic loads.

E. Use a coefficient of friction = 0.30 between the base of foundations and native soil. Where retaining wall footings are poured neat against native soil, a passive resistance of 170 pcf (EFW) may be used. The top 12 inches of soil should be neglected when computing passive resistance.

F. Where retaining walls are founded on reinforced concrete piers, the piers may be designed for an allowable skin friction of 350 psf plus a 1/3 increase for short term wind and seismic loads. The top 1 foot of soil in the pier hole

should be neglected for pier design.

G. Piers should have a minimum diameter of 18 inches and reinforced as required by the structural designer. Actual reinforcement requirements should be determined by the structural designer.

H. For lateral resistance, the piers may be designed for a passive pressure equivalent to a fluid weight of 170 pcf and may be assumed to act against 1½ pier diameters. The top 1 foot of soil should be neglected for pier design.

I. The geotechnical engineer should observe the footing or pier excavations during pier drilling to confirm anticipated soil conditions. Prior to placing steel reinforcement and pouring concrete, pier holes should be thoroughly cleaned of loose soil.

J. For seismic design of retaining walls, a dynamic surcharge load equal to $12H^2$ per foot of wall, acting at 0.6H from the top of the wall, where H is the height of the wall, should be added to the above active lateral earth pressures.

K. Fully drained walls should be backfilled with drainage materials consisting of Class 1, Type A permeable material complying with Section 68-1.025 of Caltrans Standard Specifications, latest edition.

L. The drainage material should be at least 12 inches thick. The drains should extend from the base of the walls to within 12 inches of the top of the backfill. A perforated, rigid pipe should be placed (holes down) about 4 inches above the bottom of the wall and be tied to a suitable drain outlet. Wall backdrains should be capped at the surface with clayey material to prevent infiltration of surface runoff into the backdrains. A layer of filter fabric (Mirafi 140N or equivalent) should separate the subdrain material from the overlying soil cap.

Concrete Slabs-on-Grade

28. Concrete slabs should be constructed on properly moisture conditioned and compacted engineered fill. Engineered fill should be prepared and compacted as recommended in the section entitled "Site Grading".

29. The project design professional should determine the appropriate slab reinforcing and thickness, in accordance with the anticipated use and loading of the slab. However, we recommend a minimum reinforcement of #4 bars spaced 16 inches on-center in both directions. The steel reinforcement should be held firmly in the vertical center of the slab during placement and finishing of the concrete with pre-cast concrete dobies. In addition, we recommend that consideration be given to a minimum slab thickness of 5 inches and steel reinforcement necessary to address temperature and shrinkage considerations.

Utility Trenches

30. Trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The project plans and specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

31. Utility trenches should be placed so that they do not extend below an imaginary line sloping down and away at a 1½:1 (horizontal to vertical) slope from the bottom outside edge of all footings. The structural design professional should coordinate this requirement with the utility layout plans for the project.

32. Trenches should be backfilled with granular-type material and uniformly compacted by mechanical means to the relative compaction as required by county specifications, but not less than 95 percent under paved areas and 90 percent elsewhere. The relative compaction will be based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Procedure D1557.

33. Trenches should be capped with a minimum of 12 inches of compacted relatively impermeable soil.

Site Drainage

34. Surface drainage should include provisions for positive gradients so that surface runoff is not permitted to pond adjacent to tank foundations, pavement or other improvements. Roof and surface runoff should be directed away from foundations to collection facilities and conveyed via buried plastic pipes to the toe of slopes at the tank sites. The pipe outlet facilities should be designed so that instability and/or erosion does not occur at the outlet. Concentrated surface runoff should not be allowed to flow on the slopes below the tank site.

Erosion Control

35. The soil at the project site has potential for erosion where unvegetated. We recommend the following provisions be incorporated into the project plans:

A. All grading and soil disturbance shall be kept to a minimum.

B. No eroded soil shall be allowed to leave the site.

C. All bare soil should be seeded and mulched immediately after grading with barley, rye, grass and crimson clover and covered with straw.

D. Prior to the rainy season bare soil on cut or fill slopes should be well vegetated or protected from erosion by installation of ground cover or properly installed erosion control blankets.

36. The migration of water or spread of extensive root systems below foundations, slabs, or pavements may cause undesirable differential movements and subsequent

damage to these structures. Landscaping should be planned accordingly.

Plan Review, Construction Observation and Testing

37. Haro, Kasunich and Associates must be provided an opportunity to review project plans prior to construction to evaluate if our recommendations have been properly interpreted and implemented. We should also provide foundation excavation observations and earthwork observations and testing during construction. This allows us to confirm anticipated soil conditions and evaluate conformance with our recommendations and project plans. If we do not review the plans or provide observation and testing services during the earthwork phase of the project, we assume no responsibility for misinterpretation of our recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.

3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

APPENDIX A

Site Vicinity Map

Geologic Vicinity Map

Boring Site Plan

Cross Section A

Location of Exposed Bedrock

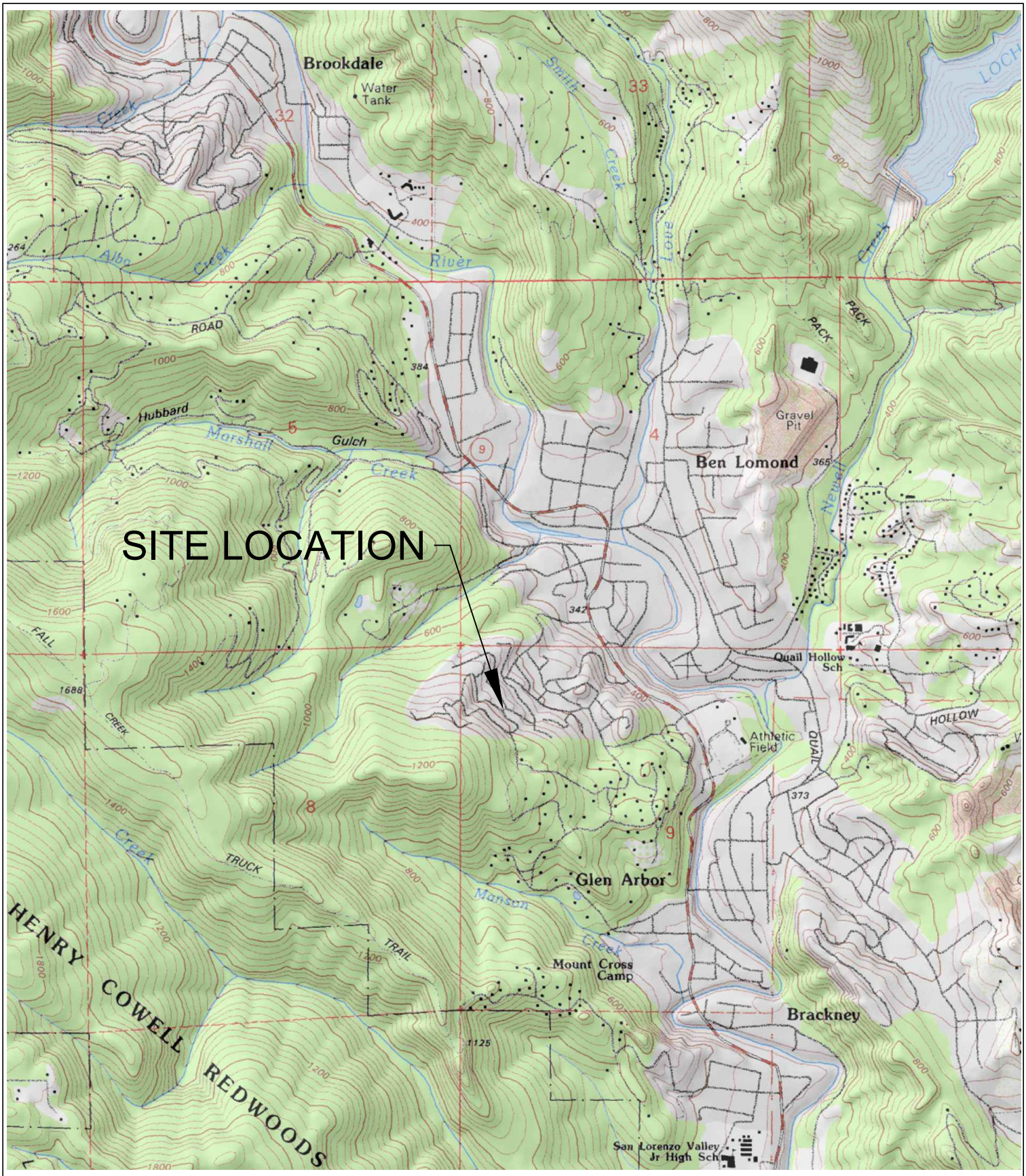
Key to Logs

Logs of Test Borings

Sieve Analysis

Unconfined Compression Test

Atterberg Limits Tests



FROM:

BEN LOMOND TOPO MAP IN SANTA CRUZ COUNTY, CALIFORNIA

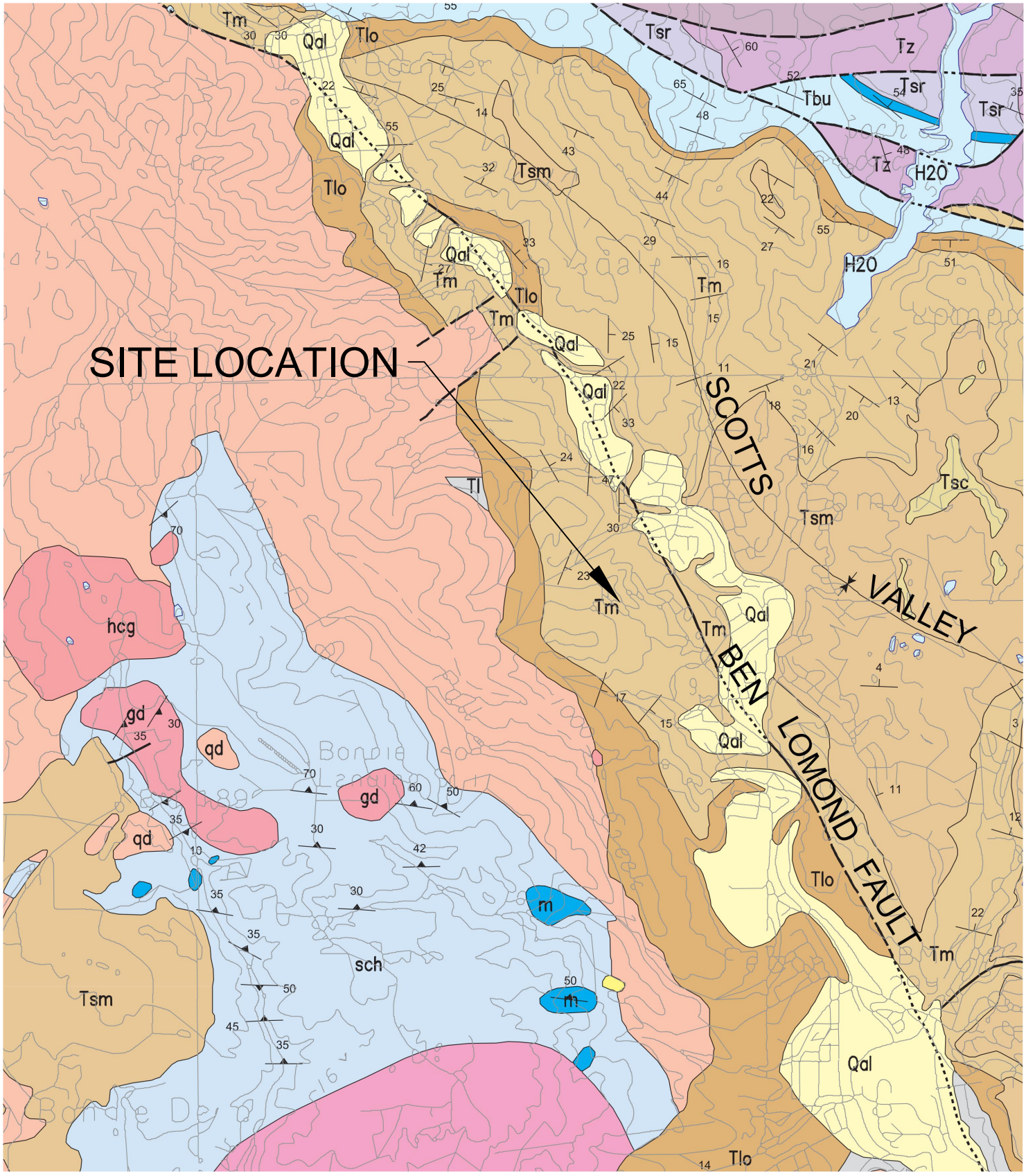
SITE VICINITY MAP
DUNDEE AVE & COUNTRY CLUB DR
BEN LOMOND, CALIFORNIA
APN: 078-233-05

SCALE:	NTS
DRAWN BY:	TSM
DATE:	AUGUST 2019
REVISED:	
JOB NO.	SC11681

HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

FIGURE NO. 1

SHEET NO.



KEY:

Qal: ALLUVIAL DEPOSITS, UNDIVIDED (HOLOCENE)
Tm: MONTEREY FORMATION (MIDDLE MIOCENE)
Tlo: LOMPICO SANDSTONE (MIDDLE MIOCENE)

FROM:

GEOLOGIC MAP OF SANTA CRUZ COUNTY, CALIFORNIA
COMPILED BY
EARL E. BRABB
DIGITAL DATABASE PREPARED BY S. GRAHAM, C. WENTWORTH, D. KNIFONG, R. GRAYMER AND J. BLIESSENBACH
1997

REGIONAL GEOLOGIC MAP

DUNDEE AVE & COUNTRY CLUB DR
BEN LOMOND, CALIFORNIA
APN: 078-233-05

SCALE:	NTS
DRAWN BY:	TSM
DATE:	AUGUST 2019
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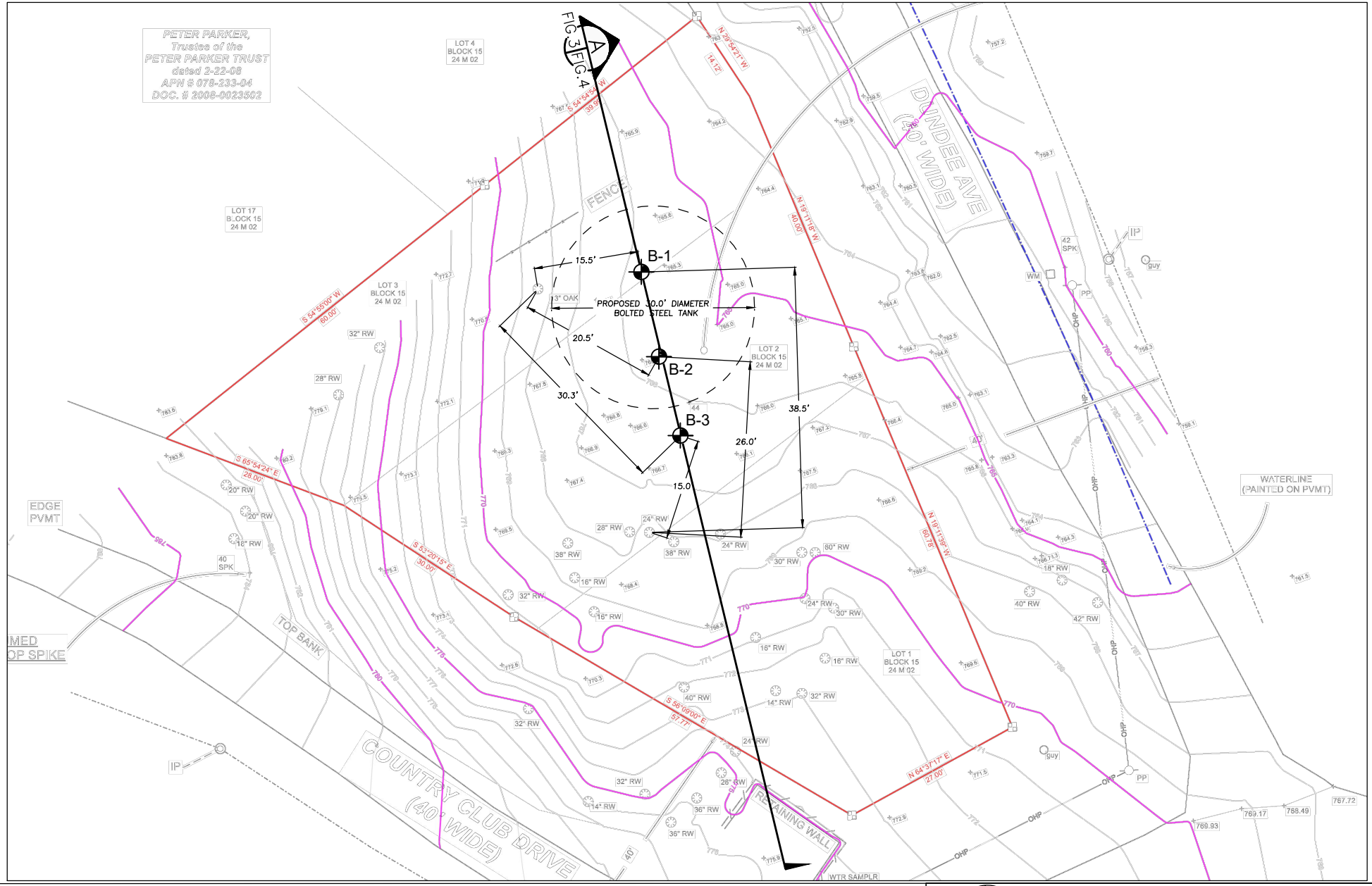
FIGURE NO. 2

SHEET NO.



NOTES:

1. TOPOGRAPHIC SURVEY FROM PAUL JENSEN DATED JUNE, JULY 2019.
2. LOCATION OF PROPOSED SWIM TANK FROM SLVWD ENGINEERING DATED JUNE, 2019.
3. DIMENSIONS TO BOREHOLES ARE APPROXIMATIONS MEASURED IN THE FIELD.

KEY: B-X = SOIL BORING LOCATION

BORING SITE PLAN

DUNDEE AVE & COUNTRY CLUB DR
BEN LOMOND, CALIFORNIA
APN: 078-233-05

SCALE:	1" = 10'
DRAWN BY:	TSM
DATE:	AUGUST 2019
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JOB NO.	SC11681

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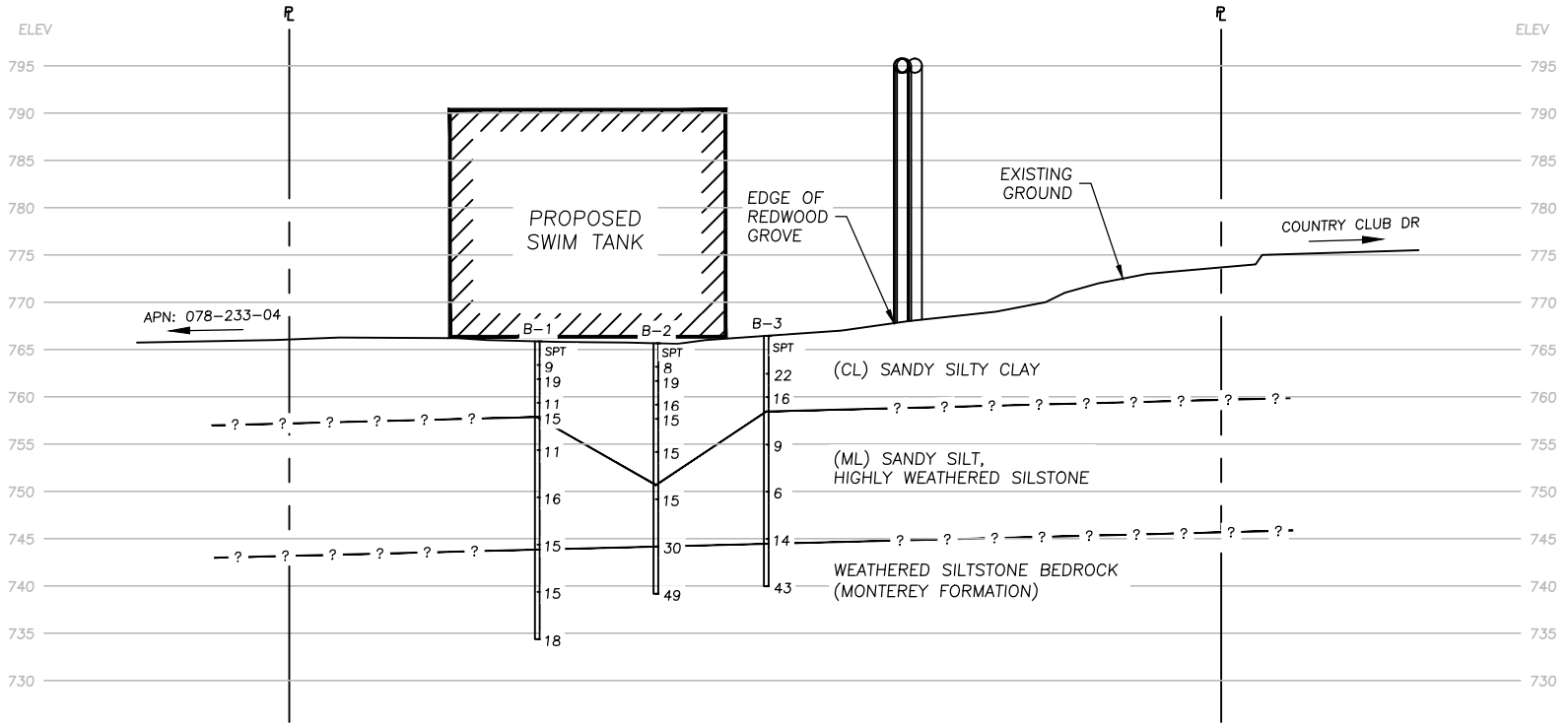
FIGURE NO. 3

SHEET NO.



TYPICAL SECTION A

FIG.3 FIG.4

Scale
Horizontal (1" = 20')
Vertical (1" = 20')

0 10 20 40
0 10 20

GEOTECHNICAL CROSS SECTION A
DUNDEE AVE & COUNTRY CLUB DR
BEN LOMOND, CALIFORNIA
APN: 078-233-05

SCALE:	1" = 20'
DRAWN BY:	TSM
DATE:	AUGUST 2019
REVISED:	
JOB NO.	SC11681

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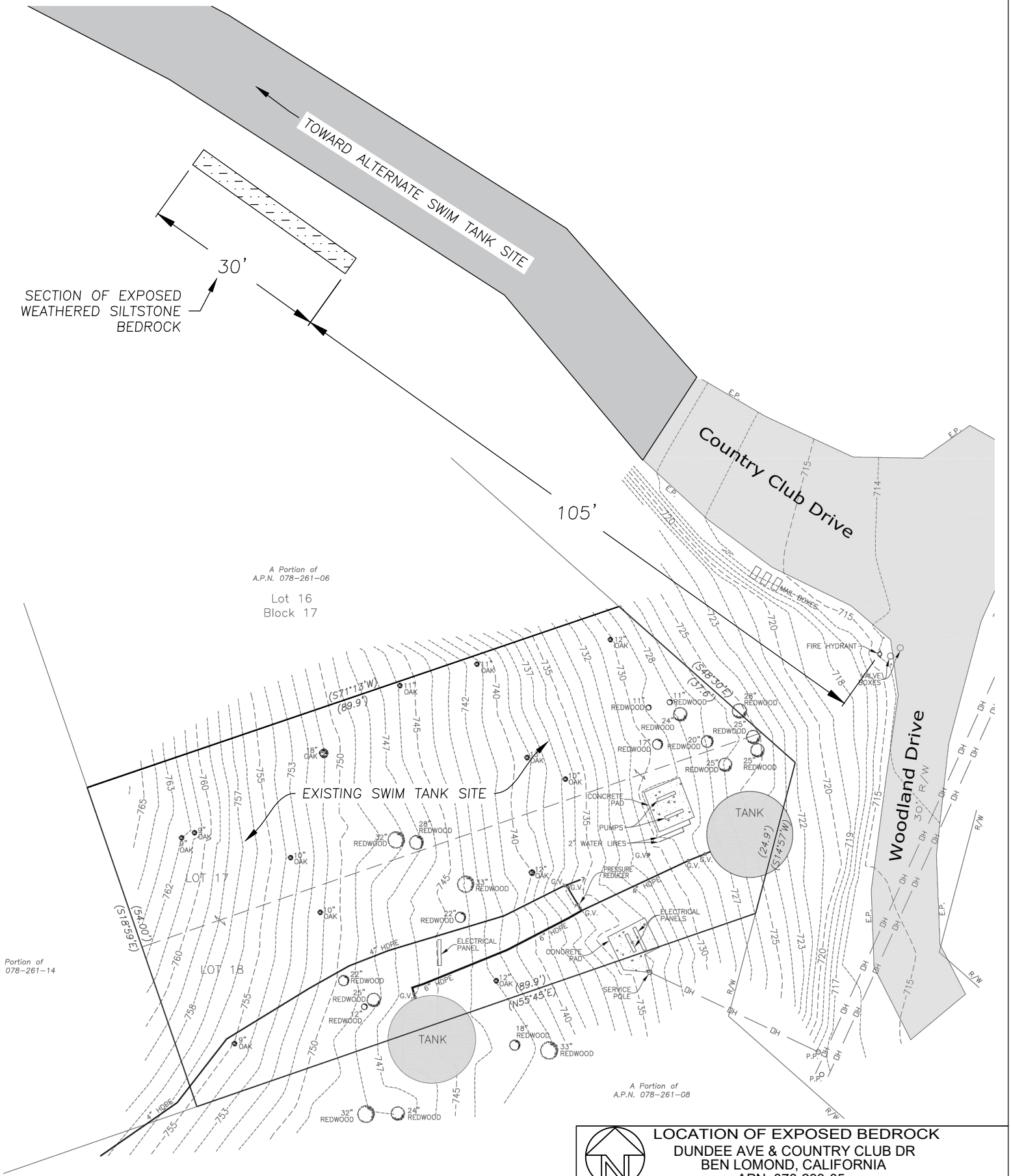
FIGURE NO. 4

SHEET NO.



0 10 20 40

SCALE: 1" = 20'

NOTES:

1. TOPO MAP FROM PAUL JENSEN, DATED JUNE 2014

LOCATION OF EXPOSED BEDROCK

DUNDEE AVE & COUNTRY CLUB DR
BEN LOMOND, CALIFORNIA
APN: 078-233-05

SCALE:	1" = 20'
DRAWN BY:	TSM
DATE:	AUGUST 2019
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JOB NO.	SC11681

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FIGURE NO. 5

SHEET NO.

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRADED SOILS (MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL (MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE)	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	WELL GRADED GRAVELS, 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, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES.
	SAND (MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE)	CLEAN SANDS (LESS THAN 5% FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTYRES, NON-PLASTIC FINES.
			SC	CLAYEY SANDS, SAND-CLAY MIXTYRES, PLASTIC FINES.
FINE GRADED SOILS (MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYES (LIQUID LIMIT LESS THAN 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, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.
	SILTS AND CLAYES (LIQUID LIMIT GREATER THAN 50%)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS.
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4"	2"	12"	
SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS PER FOOT*
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH (TSF)**	BLOWS PER FOOT*
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

SAMPLING METHOD

STANDARD PENETRATION TEST	T	
MODIFIED CALIFORNIA	MC	
PITCHER BARREL	P	
SHELBY TUBE	S	
BULK	B	

WATER

FINAL	
INITIAL	
WATER LEVEL DESIGNATION	

*Number of blows of 140 lb hammer falling 30 inches to drive a 2" O.D. (1 3/8" I.D.) split spoon sampler (ASTM D-1586).

**Unconfined compressive strength in tons/ft2 as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

KEY TO LOGS
DUNDEE AVE & COUNTRY CLUB DR
BEN LOMOND, CALIFORNIA
APN: 078-233-05

SCALE:	NTS
DRAWN BY:	TSM
DATE:	AUGUST 2019
REVISED:	
JOB NO.	SC11681

HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

FIGURE NO. 6

SHEET NO.

Haro, Kasunich & Associates, Inc.
Geotechnical & Environmental Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** 6" **BORING NO.** B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0									
	1-1-1 (L)		Brown sandy Silt, moist, firm to 2' and Sandy Silty CLAY, moist, stiff	CL	18				
	1-2 (T)				19				
5	1-3-2 (L)		Mottled light brown Silty CLAY, moist, stiff	CL	21		79.3	38.9	
	1-4 (T)		Mottled light brown cemented SILT with SILTSTONE gravels, moist, stiff	ML	15				
10	1-5 (T)		Fractured SILTSTONE (10" recovery) moist, stiff		11				
15	1-6 (T)		Mottled light brown, weakly cemented Sandy SILT (12" recovery), moist, very stiff		16				
20	1-7 (T)		Weakly cemented Sandy SILT with pockets of CLAY, angular SILTSTONE gravels	SM	15				
			Highly weathered bedrock (Monterey Shale), thin layer of black quartz shale, moist, very stiff						
25	1-8 (T)		Weakly cemented Sandy SILT, light brown, moist, very stiff (12" recovery)	ML	15				
30	1-9 (T)		Very moist, stiff		18				
			Boring terminated at 31.5 feet						
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 7

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0									
	2-1-1 (L)		Dark brown Sandy Silt wtih roots, moist, firm	CL	15		92	22.7	
			(roots fewer in 2-1-2)						
	2-2 (T)		Brown Sandy CLAY, moist stiff	CL	19			18.3	(2-2) Grain Size Analysis
5									% Gravel = 0
	2-3-1 (L)		Brown CLAY with SAND and roots, moist, very stiff		32		91.2	32.2	% Sand = 20.6
	2-4 (T)				15				% Fines = 79.4
			Mottled brown Sandy CLAY with SILT with SILTSTONE gravels (10" recovery), moist, stiff	CL					PI = 18
10	2-5 (T)				15			45.1	
15	2-6 (T)		Light brown-orange, cemented Sandy SILT (12" recovery), moist	ML	15				
20	2-7 (T)		Brown SILTSTONE gravels in CLAY matrix with thin layer black highly weathered shale (Monterey Formation), moist, very stiff to hard (harder drilling)	ML	30				
25	2-8 (T)		less weathered siltstone bedrock, moist, hard (Monterey Formation)		49				
			Boring terminated at 26.5 feet						
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\SC11681 Dundee Avenue and Country Club.log Date: 8/28/2019

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 8

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** **BORING NO.** B-3

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0									
	3-1-2 (L)		Brown Sandy CLAY, with 1.5" diameter redwood root, moist, very stiff	CL	44		79.2	26.0	PI = 20
5	3-2 (T)		Brown Sandy CLAY, with Silt and roots, moist, very stiff		16				
10	3-3 (T)		Brown-orange Sandy SILT with small siltstone, gravels, moist, stiff	ML	9				
15	3-4 (T)		Fractured siltstone (10" recovery)		6				
			Increase in moisture @ 19'						
20	3-5 (T)		Highly weathered siltstone bedrock, withsiltstone gravels	ML	14				
25	3-6 (T)		Less weathered siltstone bedrock with thin layer highly weathered shale (Monterey Formation), moist, hard	ML	43				
			Boring terminated at 26.5 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | **FIGURE NO.** 9

Haro, Kasunich & Associates, Inc.
Geotechnical and Geoenvironmental Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** 6" **BORING NO.** B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	1-1-1 (L)		Brown sandy Silty CLAY, moist, stiff	CL	18				
	1-2 (T)				19				
5	1-3-2 (L)		Mottled light brown Silty CLAY, moist, stiff	CL	21		79.3	38.9	
	1-4 (T)		Mottled light brown cemented SILT with SILTSTONE gravels, moist, stiff	ML	15				
10	1-5 (T)		Fractured SILTSTONE (10" recovery) moist, stiff		11				
15	1-6 (T)		Mottled light brown, weakly cemented Sandy SILT (12" recovery), moist, very stiff		16				
20	1-7 (T)		Weakly cemented Sandy SILT with pockets of CLAY, angular SILTSTONE gravels	SM	15				
			Highly weathered bedrock (Monterey Shale), thin layer of black quartz shale, moist, very stiff						
25	1-8 (T)		Weakly cemented Sandy SILT, light brown, moist, very stiff (12" recovery)	ML	15				
30	1-9 (T)		Very moist, stiff		18				
35			Boring terminated at 31.5 feet						

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 7

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	2-1-1 (L)		Dark brown Silty CLAY wtih roots, moist, stiff roots (fewer in 2-1-2)	CL	15		92	22.7	
	2-2 (T)		Brown Sandy CLAY, moist	CL	19			18.3	(2-2) Grain Size Analysis % Gravel = 0 % Sand = 20.6 % Fines = 79.4 PI = 18
5	2-3-1 (L)		Brown CLAY with SAND and roots, moist, very stiff		32		91.2	32.2	
	2-4 (T)				15				
			Mottled brown Sandy CLAY with SILT with SILTSTONE gravels (10" recovery), moist, stiff	CL					
10	2-5 (T)				15			45.1	
15	2-6 (T)		Light brown-orange, cemented Sandy SILT (12" recovery), moist	ML	15				
20	2-7 (T)		Brown SILTSTONE gravels in CLAY matrix with thin layer black highly weathered shale (Monterey Formation), moist, very stiff to hard (harder drilling)	ML	30				
25	2-8 (T)		less weathered siltstone bedrock, moist, hard (Monterey Formation)		49				
			Boring terminated at 26.5 feet						
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\SC11681 Dundee Avenue and Country Club.log Date: 8/28/2019

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 8

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-3

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0									
	3-1-2 (L)		Brown Sandy CLAY, with 1.5" diameter redwood root, moist, very stiff	CL	44		79.2	26.0	PI = 20
5	3-2 (T)		Brown Sandy CLAY, with Silt and roots, moist, very stiff		16				
10	3-3 (T)		Brown-orange Sandy SILT with small siltstone, gravels, moist, stiff	ML	9				
15	3-4 (T)		Fractured siltstone (10" recovery)		6				
			Increase in moisture @ 19'						
20	3-5 (T)		Highly weathered siltstone bedrock, withsiltstone gravels	ML	14				
25	3-6 (T)		Less weathered siltstone bedrock with thin layer highly weathered shale (Monterey Formation), moist, hard	ML	43				
			Boring terminated at 26.5 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | **FIGURE NO.** 9

Haro, Kasunich & Associates, Inc.
Geotechnical and Geoenvironmental Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** 6" **BORING NO.** B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	1-1-1 (L)		Brown sandy Silty CLAY, moist, stiff	CL	18				
	1-2 (T)				19				
5	1-3-2 (L)		Mottled light brown Silty CLAY, moist, stiff	CL	21		79.3	38.9	
	1-4 (T)		Mottled light brown cemented SILT with SILTSTONE gravels, moist, stiff	ML	15				
10	1-5 (T)		Fractured SILTSTONE (10" recovery) moist, stiff		11				
15	1-6 (T)		Mottled light brown, weakly cemented Sandy SILT (12" recovery), moist, very stiff		16				
20	1-7 (T)		Weakly cemented Sandy SILT with pockets of CLAY, angular SILTSTONE gravels	SM	15				
			Highly weathered bedrock (Monterey Shale), thin layer of black quartz shale, moist, very stiff						
25	1-8 (T)		Weakly cemented Sandy SILT, light brown, moist, very stiff (12" recovery)	ML	15				
30	1-9 (T)		Very moist, stiff		18				
35			Boring terminated at 31.5 feet						

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 7

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	2-1-1 (L)		Dark brown Silty CLAY wtih roots, moist, stiff roots (fewer in 2-1-2)	CL	15		92	22.7	
	2-2 (T)		Brown Sandy CLAY, moist	CL	19			18.3	(2-2) Grain Size Analysis % Gravel = 0 % Sand = 20.6 % Fines = 79.4 PI = 18
5	2-3-1 (L)		Brown CLAY with SAND and roots, moist, very stiff		32		91.2	32.2	
	2-4 (T)				15				
			Mottled brown Sandy CLAY with SILT with SILTSTONE gravels (10" recovery), moist, stiff	CL					
10	2-5 (T)				15			45.1	
15	2-6 (T)		Light brown-orange, cemented Sandy SILT (12" recovery), moist	ML	15				
20	2-7 (T)		Brown SILTSTONE gravels in CLAY matrix with thin layer black highly weathered shale (Monterey Formation), moist, very stiff to hard (harder drilling)	ML	30				
25	2-8 (T)		less weathered siltstone bedrock, moist, hard (Monterey Formation)		49				
			Boring terminated at 26.5 feet						
30									
35									

SuperLog CivilTech Software, USA www.civiltech.com File: C:\superlog4\HKALOGS\SC11681 Dundee Avenue and Country Club.log Date: 8/28/2019

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 8

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-3

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0									
	3-1-2 (L)		Brown Sandy CLAY, with 1.5" diameter redwood root, moist, very stiff	CL	44		79.2	26.0	PI = 20
5	3-2 (T)		Brown Sandy CLAY, with Silt and roots, moist, very stiff		16				
10	3-3 (T)		Brown-orange Sandy SILT with small siltstone, gravels, moist, stiff	ML	9				
15	3-4 (T)		Fractured siltstone (10" recovery)		6				
			Increase in moisture @ 19'						
20	3-5 (T)		Highly weathered siltstone bedrock, withsiltstone gravels	ML	14				
25	3-6 (T)		Less weathered siltstone bedrock with thin layer highly weathered shale (Monterey Formation), moist, hard	ML	43				
			Boring terminated at 26.5 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | **FIGURE NO.** 9

Haro, Kasunich & Associates, Inc.
Geotechnical and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** 6" **BORING NO.** B-1

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	1-1-1 (L)		Sandy Silty CLAY, brown, moist, firm	CL	18				
	1-2 (T)				19				
5	1-3-2 (L)		Silty CLAY, light brown, moist, firm, mottled	CL	21		79.3	38.9	
	1-4 (T)		Siltstone/cemented SILT, light brown, moist gravels, mottled	ML	15				
10	1-5 (T)		Moderately cemented Recovery 10" coarse siltstone gravel		11				
15	1-6 (T)		Weakly cemented Sandy SILT, recovery 12", light brown, mottled, moist		16				
20	1-7 (T)		Weakly cemented Sandy SILT with pockets of CLAY, angular gravels	SM	15				
			Highly weathered bedrock (Monterey Shale), thin layer of black quartz shale						
25	1-8 (T)		Weakly cemented Sandy SILT, light brown, moist 12 recovery	ML	15				
30	1-9 (T)		More moisture		18				
			Boring terminated at 31.5 feet						
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr **FIGURE NO.** 7

Haro, Kasunich & Associates, Inc.
Coastal and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-2

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	2-1-1 (L)		Dark brown Silty CLAY, moist, medium, organic roots (fewer in 2-1-2)	CL	15		92	22.7	
	2-2 (T)		Sandy CLAY, brown, moist, firm	CL	19			18.3	(2-2) Grain Size Analysis
5	2-3-1 (L)		CLAY with SAND, brown, moist, stiff few organic roots		32		91.2	32.2	% Gravel = 0 % Sand = 20.6
	2-4 (T)		More SAND		15				% Fines = 79.4 PI = 18
			Some mottling organic roots 10" recovery	CL					
10	2-5 (T)		Sandy CLAY with SILT, large gravels, cemented siltstones		15			45.1	
15	2-6 (T)		Cemented Sandy SILT/weak/light brown-orange, moist 12" recovery	ML	15				
20	2-7 (T)		Siltstone gravels, pockets of CLAY, thin layer highly weathered shale (black Monterey Formation) brown, slight mottling, moist More difficult to drill	ML	30				
25	2-8 (T)		Weathered siltstone bedrock, very dense		49				
			Boring terminated at 26.5 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | **FIGURE NO.** 8

Haro, Kasunich & Associates, Inc.
Geotechnical and Geotechnical Engineers

Dundee Avenue and Country Club

PROJECT NO. SC11681

LOGGED BY TSM **DATE DRILLED** 7-16-19 **BORING DIAMETER** _____ **BORING NO.** B-3

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0	3-1-2 (L)		Brown Sandy CLAY, medium, moist, encountered large redwood root	CL	44		79.2	26.0	PI = 20
5	3-2 (T)		Sandy CLAY, brown, firm, moist, few roots, some SILTS		16				
10	3-3 (T)		At 10' Sandy SILT, brown-orange, moist, loose-medium dense, siltstone (small) gravels	ML	9				
15	3-4 (T)		Recovery 10" siltstone gravels		6				
			19" - increase in moisture						
20	3-5 (T)		Highly weathered siltstone bedrock, siltstone gravels at 20'	ML	14				
25	3-6 (T)		Weathered siltstone bedrock, dense, thin layer highly weathered shale (Monterey Formation)		43				
			Boring terminated at 26.5 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr | **FIGURE NO.** 9

Sieve Analysis

Project Name:	Swim Tank Alt Site			
File No.:	SC 11681			
Sample No.:	2-2			
Date:	8/7/19			
By:	RC			
Sample Description:				
Brown Sandy Clay				
Group Symbol:	SC	If more than 5% fines		
Gravel Content	0.0%	type 1 for silt →		
Sand Content:	20.6%	type 2 for clay		
Fines Content:	79.4%	type 3 for both		

Height Of Sample (in) or Enter "Bag"	BAG
Tare No.	29
Gross Wet Weight	670.8
Gross Dry Weight	631.7
Tare Weight	418.1
Net Dry Weight	213.6
Weight of Water	39.1
% Moisture	18.3%
Dry Density	#VALUE!
Gross Dry after wash	470.1

Sieve	Weight Retained (grams)	% Retained	Cumulative Percent		Specs
			Retained	Passing	
1½"	0.0	0.0%	0.0%	100.0%	
1"	0.0	0.0%	0.0%	100.0%	
¾"	0.0	0.0%	0.0%	100.0%	
1/2"	0.0	0.0%	0.0%	100.0%	
3/8"	0.0	0.0%	0.0%	100.0%	
No. 4	0.0	0.0%	0.0%	100.0%	
No. 8	0.1	0.0%	0.0%	100.0%	
No. 16	0.2	0.1%	0.1%	99.9%	
No. 30	0.9	0.4%	0.6%	99.4%	
No. 50	1.6	0.7%	1.3%	98.7%	
No. 100	3.9	1.8%	3.1%	96.9%	
No. 200	37.4	17.5%	20.6%	79.4%	
Left in Pan	7.9	0.036985019			
ALL FINES	169.5	79.4%	100.0%	0.0%	
Total	213.6	100.0%		100.0%	

Washed Out	161.6
Check to match with Gross dry after wash	470.1

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Test Report Prepared By HKA Lab

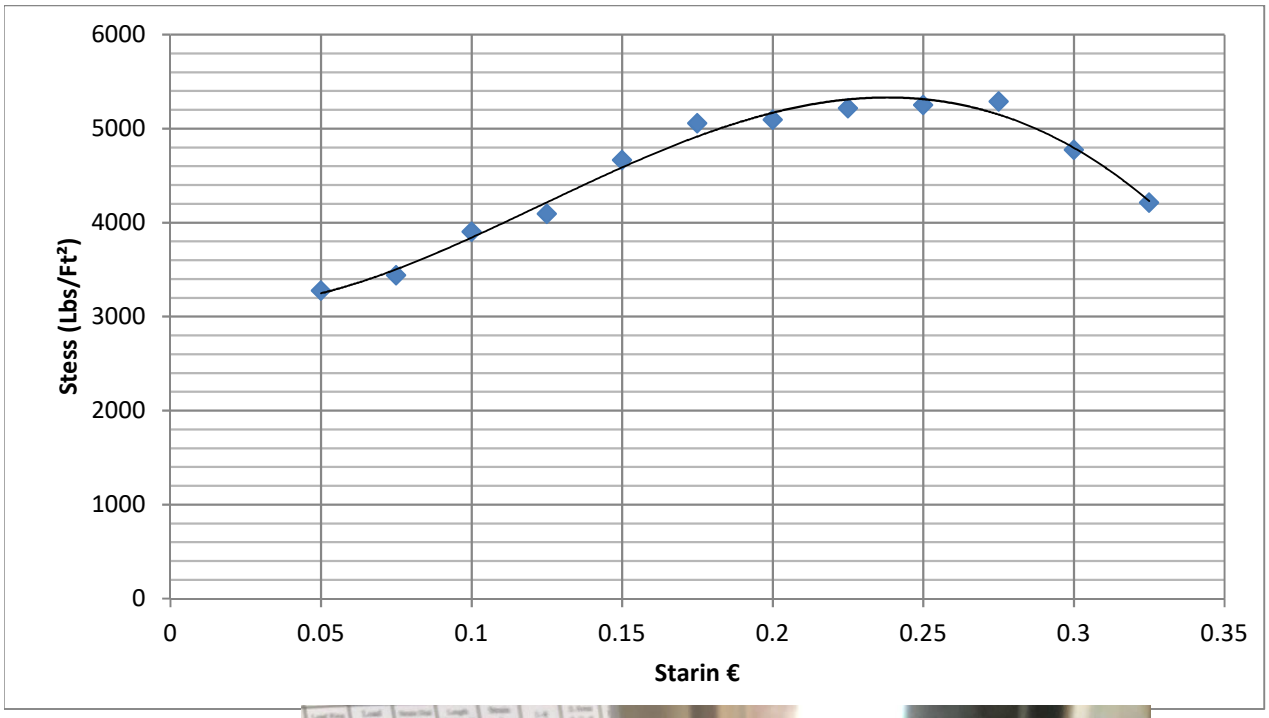
Triaxial and Unconfined Compression Test

Moisture Content		Specimen Dimensions				File N°	SC 11681
Tare N°	9	(Height)	Length :	6	in	Sample N°	2-1-1
Gross Wet	963.5	≤5"	Diameter:	2.375	in	Date:	8/7/2019
Gross Dry Wt	822.9		Area:	0.0307649	ft²	By:	RC
Tare Wt.	100.9		Volume:	0.02	ft^3	Description:	
Net Dry Wt.	722	Density Factors				Brown Silty Clay w/ Roots	
Wt. of Water	140.6		Size		Factor		
% moisture	19.5%	☐	Liner:	6"	0.86	Remarks	
Dry Density=	103.4867	☐	Shelby:	1.87"	1.388		
Load Ring	18278			Max load (Lb)	170.5	Root In Sample	

Elapsed Time	Load Ring Readings	Load P	Strain Dial Readings	Length Change ΔL	Strain €	1- €	Δ Area A_o/1- €	Axial Pressure qu=P/A
Minutes	0.0001in	LBS	0.001 in	in	Fraction	Fraction	ft²	Lbs/Ft²
0.25	21	24.424	0.025	0.025	0.0041667	0.995833	0.030894	790.5841
0.5	104	101.65	0.050	0.050	0.0083333	0.991667	0.031023	3276.569
0.75	110	107.233	0.075	0.075	0.0125	0.9875	0.031154	3441.994
1	126	122.12	0.100	0.100	0.0166667	0.983333	0.031286	3903.302
1.25	133	128.633	0.125	0.125	0.0208333	0.979167	0.031419	4094.057
1.5	153	147.242	0.150	0.150	0.025	0.975	0.031554	4666.384
1.75	167	160.268	0.175	0.175	0.0291667	0.970833	0.031689	5057.501
2	169	162.129	0.200	0.200	0.0333333	0.966667	0.031826	5094.266
2.25	174	166.781	0.225	0.225	0.0375	0.9625	0.031964	5217.855
2.5	176	168.642	0.250	0.250	0.0416667	0.958333	0.032103	5253.234
2.75	178	170.503	0.275	0.275	0.0458333	0.954167	0.032243	5288.108
3	161	154.685	0.300	0.300	0.05	0.95	0.032384	4776.583
3.25	142	137.007	0.325	0.325	0.0541667	0.945833	0.032527	4212.132
3.5		4.8848	0.350	0.350	0.0583333	0.941667	0.032671	149.5163
3.75		4.8848	0.375	0.375	0.0625	0.9375	0.032816	148.8547
4		4.8848	0.400	0.400	0.0666667	0.933333	0.032962	148.1932
4.25		4.8848	0.425	0.425	0.0708333	0.929167	0.03311	147.5316
4.5		4.8848	0.450	0.450	0.075	0.925	0.033259	146.87
4.75		4.8848	0.475	0.475	0.0791667	0.920833	0.03341	146.2084
5		4.8848	0.500	0.500	0.0833333	0.916667	0.033562	145.5469
5.25		4.8848	0.525	0.525	0.0875	0.9125	0.033715	144.8853
5.5		4.8848	0.550	0.550	0.0916667	0.908333	0.03387	144.2237
5.75		4.8848	0.575	0.575	0.0958333	0.904167	0.034026	143.5621
6		4.8848	0.600	0.600	0.1	0.9	0.034183	142.9006
6.25		4.8848	0.625	0.625	0.1041667	0.895833	0.034342	142.239
6.5		4.8848	0.650	0.650	0.1083333	0.891667	0.034503	141.5774
6.75		4.8848	0.675	0.675	0.1125	0.8875	0.034665	140.9158
7		4.8848	0.700	0.700	0.1166667	0.883333	0.034828	140.2542
7.25		4.8848	0.725	0.725	0.1208333	0.879167	0.034993	139.5927
7.5		4.8848	0.750	0.750	0.125	0.875	0.03516	138.9311

Haro, Kasunich and Associates Inc.
Geotechnical and Coastal Engineering

Triaxial and Unconfined Compression Test



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Geotechnical and Coastal Engineering

Liquid Limit:	35.11
Plastic Limit:	17.52
Plasticity Index:	17.6

PI
18

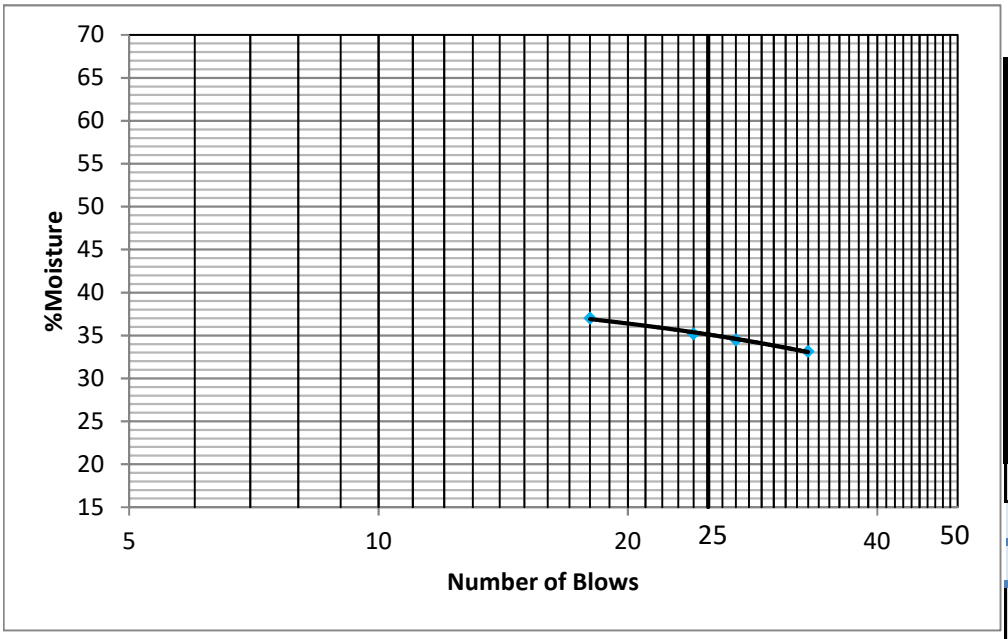
HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

File N◦	SC 11681
Sample N◦	2-2
Date:	7/29/2019
By:	RC

P.I. SOIL TEST

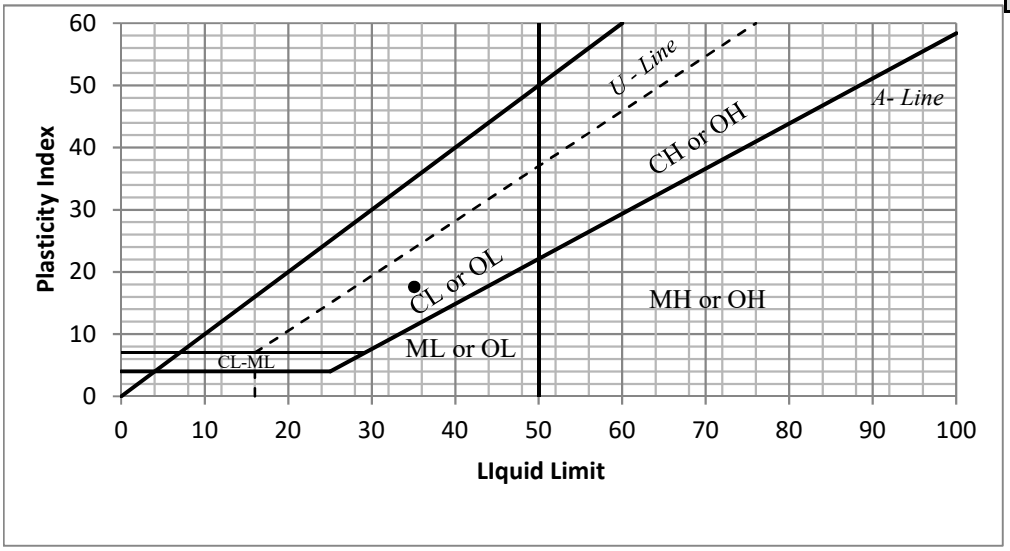
	PLASTIC LIMIT			
Determination	1	2	3	4
Tare N◦	p9	p18		
Gross Wet WT.	17.12	17.02		
GrossDry WT.	16.61	16.54		
Tare WT.	13.76	13.74		
NET DRY WT.	2.85	2.80	0.00	0.00
WT. OF Water	0.51	0.48	0.00	0.00
% Moisture	17.89	17.14	#DIV/0!	#DIV/0!

LIQUID LIMIT			
NUMBER OF BLOWS			
33	27	24	18
geo	b2	a2	e1
18.24	20.30	20.12	20.32
14.77	16.96	16.76	16.78
4.31	7.28	7.22	7.22
10.46	9.68	9.54	9.56
3.47	3.34	3.36	3.54
33.17	34.50	35.22	37.03



Sample #	2-2
Ht. of Sample	Bag
Tare	40
Gross Wet Wt	733.3
Gross Dry Wt.	675.0
Tare Wt.	415.0
Net Dry Wt.	260.0
Wt. Of Water	58.3
% Moisture	22.4%
Dry Density	#VALUE!

SOIL DESCRIPTION	
Brown Silty	
Lean Clay	
Group Symbol	CL



Liquid Limit:	41.32
Plastic Limit:	21.48
Plasticity Index:	19.8

PI
20

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

File N◦	SC 11681
Sample N◦	3-1-2
Date:	8/14/2019
By:	RC

P.I. SOIL TEST

	PLASTIC LIMIT			
Determination	1	2	3	4
Tare N◦	p10	p4	102	
Gross Wet WT.	20.84	16.86	19.19	
GrossDry WT.	19.61	16.30	18.27	
Tare WT.	13.80	13.73	13.71	
NET DRY WT.	5.81	2.57	4.56	0.00
WT. OF Water	1.23	0.56	0.92	0.00
% Moisture	21.17	21.79	20.18	#DIV/0!

LIQUID LIMIT			
NUMBER OF BLOWS			
34	27	22	17
E2	C2	E4	NTA
18.38	22.54	22.82	16.86
15.32	18.07	18.20	13.98
7.30	7.28	7.27	7.35
8.02	10.79	10.93	6.63
3.06	4.47	4.62	2.88
38.15	41.43	42.27	43.44

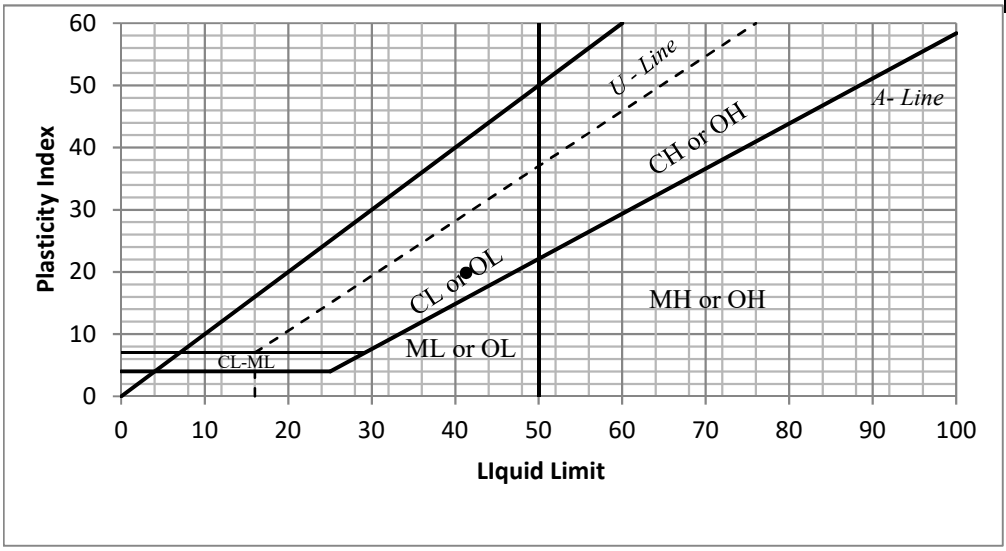
Sample #	3-1-2
Ht. of Sample	5.1
Tare	99
Gross Wet Wt	1006.8
Gross Dry Wt.	884.8
Tare Wt.	415.2
Net Dry Wt.	469.6
Wt. Of Water	122.0
% Moisture	26.0%
Dry Density	79.2

SOIL DESCRIPTION

Mottled Orange & Olive Brown

Silty Lean CLAY

Group Symbol	CL



Appendix E

Noise Data and Analyses

Pump Station Noise Reference Data

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 63.2 - 2019/03/27 09:22:43
- Level Range : 40-100
- SEL : 80.2
- Leq : 55.5 at 5 feet
-

No.s	Date Time	(dB)
1	2019/03/27 09:21:38	54.9
2	2019/03/27 09:21:41	54.6
3	2019/03/27 09:21:44	54.7
4	2019/03/27 09:21:47	54.7
5	2019/03/27 09:21:50	54.6
6	2019/03/27 09:21:53	54.5
7	2019/03/27 09:21:56	54.4
8	2019/03/27 09:21:59	54.6
9	2019/03/27 09:22:02	54.6
10	2019/03/27 09:22:05	54.6
11	2019/03/27 09:22:08	54.5
12	2019/03/27 09:22:11	54.7
13	2019/03/27 09:22:14	54.5
14	2019/03/27 09:22:17	54.8
15	2019/03/27 09:22:20	55.1
16	2019/03/27 09:22:23	55.0
17	2019/03/27 09:22:26	55.5
18	2019/03/27 09:22:29	55.4
19	2019/03/27 09:22:32	55.2
20	2019/03/27 09:22:35	56.2
21	2019/03/27 09:22:38	58.1
22	2019/03/27 09:22:41	63.2
23	2019/03/27 09:22:44	61.0
24	2019/03/27 09:22:47	60.1
25	2019/03/27 09:22:50	62.0
26	2019/03/27 09:22:53	59.7
27	2019/03/27 09:22:56	58.6
28	2019/03/27 09:22:59	57.0
29	2019/03/27 09:23:02	57.9
30	2019/03/27 09:23:05	56.7
31	2019/03/27 09:23:08	55.6
32	2019/03/27 09:23:11	55.6
33	2019/03/27 09:23:14	55.5
34	2019/03/27 09:23:17	55.5
35	2019/03/27 09:23:20	55.2
36	2019/03/27 09:23:23	55.3
37	2019/03/27 09:23:26	55.3
38	2019/03/27 09:23:29	55.0
39	2019/03/27 09:23:32	54.9
40	2019/03/27 09:23:35	54.9
41	2019/03/27 09:23:38	54.8
42	2019/03/27 09:23:41	54.7
43	2019/03/27 09:23:44	54.7
44	2019/03/27 09:23:47	54.8
45	2019/03/27 09:23:50	54.9
46	2019/03/27 09:23:53	55.0
47	2019/03/27 09:23:56	54.7
48	2019/03/27 09:23:59	54.7
49	2019/03/27 09:24:02	54.7
50	2019/03/27 09:24:05	54.6
51	2019/03/27 09:24:08	54.7
52	2019/03/27 09:24:11	54.6
53	2019/03/27 09:24:14	54.5
54	2019/03/27 09:24:17	54.6
55	2019/03/27 09:24:20	54.5
56	2019/03/27 09:24:23	54.4
57	2019/03/27 09:24:26	54.2
58	2019/03/27 09:24:29	54.4
59	2019/03/27 09:24:32	54.1
60	2019/03/27 09:24:35	54.2
61	2019/03/27 09:24:38	54.2
62	2019/03/27 09:24:41	54.1
63	2019/03/27 09:24:44	54.1
64	2019/03/27 09:24:47	54.2
65	2019/03/27 09:24:50	54.1
66	2019/03/27 09:24:53	53.9
67	2019/03/27 09:24:56	54.0
68	2019/03/27 09:24:59	54.0
69	2019/03/27 09:25:02	54.0
70	2019/03/27 09:25:05	54.1
71	2019/03/27 09:25:08	54.1
72	2019/03/27 09:25:11	54.1
73	2019/03/27 09:25:14	54.2
74	2019/03/27 09:25:17	54.4
75	2019/03/27 09:25:20	54.5
76	2019/03/27 09:25:23	54.7
77	2019/03/27 09:25:26	54.8
78	2019/03/27 09:25:29	54.6
79	2019/03/27 09:25:32	54.5
80	2019/03/27 09:25:35	54.7
81	2019/03/27 09:25:38	54.4
82	2019/03/27 09:25:41	54.7
83	2019/03/27 09:25:44	54.4
84	2019/03/27 09:25:47	54.6
85	2019/03/27 09:25:50	54.7

86	2019/03/27	09:25:53	54.6
87	2019/03/27	09:25:56	56.6
88	2019/03/27	09:25:59	56.2
89	2019/03/27	09:26:02	54.6
90	2019/03/27	09:26:05	54.7
91	2019/03/27	09:26:08	54.2
92	2019/03/27	09:26:11	54.3
93	2019/03/27	09:26:14	54.3
94	2019/03/27	09:26:17	54.6
95	2019/03/27	09:26:20	54.6
96	2019/03/27	09:26:23	54.5
97	2019/03/27	09:26:26	54.5
98	2019/03/27	09:26:29	54.4
99	2019/03/27	09:26:32	54.4
100	2019/03/27	09:26:35	54.1

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 68.4 - 2019/03/27 09:11:35
- Level Range : 40-100
- SEL : 82.9
- Leq : 55.2 at 5 feet
-

No.s	Date Time	(dB)
1	2019/03/27 09:11:19	50.7
2	2019/03/27 09:11:22	55.5
3	2019/03/27 09:11:25	55.6
4	2019/03/27 09:11:28	59.5
5	2019/03/27 09:11:31	64.8
6	2019/03/27 09:11:34	68.0
7	2019/03/27 09:11:37	65.4
8	2019/03/27 09:11:40	62.0
9	2019/03/27 09:11:43	64.8
10	2019/03/27 09:11:46	61.5
11	2019/03/27 09:11:49	56.4
12	2019/03/27 09:11:52	58.1
13	2019/03/27 09:11:55	54.4
14	2019/03/27 09:11:58	48.6
15	2019/03/27 09:12:01	47.3
16	2019/03/27 09:12:04	45.7
17	2019/03/27 09:12:07	44.9
18	2019/03/27 09:12:10	42.1
19	2019/03/27 09:12:13	41.2
20	2019/03/27 09:12:16	39.5
21	2019/03/27 09:12:19	40.3
22	2019/03/27 09:12:22	38.0
23	2019/03/27 09:12:25	41.6
24	2019/03/27 09:12:28	42.7
25	2019/03/27 09:12:31	38.8
26	2019/03/27 09:12:34	39.8
27	2019/03/27 09:12:37	38.5
28	2019/03/27 09:12:40	40.7
29	2019/03/27 09:12:43	40.2
30	2019/03/27 09:12:46	41.1
31	2019/03/27 09:12:49	41.2
32	2019/03/27 09:12:52	40.1
33	2019/03/27 09:12:55	42.3
34	2019/03/27 09:12:58	43.5
35	2019/03/27 09:13:01	43.3
36	2019/03/27 09:13:04	41.8
37	2019/03/27 09:13:07	37.6
38	2019/03/27 09:13:10	37.0
39	2019/03/27 09:13:13	37.1
40	2019/03/27 09:13:16	38.0
41	2019/03/27 09:13:19	37.0
42	2019/03/27 09:13:22	37.6
43	2019/03/27 09:13:25	39.3
44	2019/03/27 09:13:28	40.0
45	2019/03/27 09:13:31	41.2
46	2019/03/27 09:13:34	39.1
47	2019/03/27 09:13:37	38.5
48	2019/03/27 09:13:40	37.7
49	2019/03/27 09:13:43	36.8
50	2019/03/27 09:13:46	37.5
51	2019/03/27 09:13:49	38.0
52	2019/03/27 09:13:52	38.8
53	2019/03/27 09:13:55	38.8
54	2019/03/27 09:13:58	38.1
55	2019/03/27 09:14:01	41.2
56	2019/03/27 09:14:04	43.9
57	2019/03/27 09:14:07	51.3
58	2019/03/27 09:14:10	50.7
59	2019/03/27 09:14:13	55.2
60	2019/03/27 09:14:16	63.8
61	2019/03/27 09:14:19	63.1
62	2019/03/27 09:14:22	60.9
63	2019/03/27 09:14:25	59.9
64	2019/03/27 09:14:28	57.6
65	2019/03/27 09:14:31	55.5
66	2019/03/27 09:14:34	51.3
67	2019/03/27 09:14:37	47.4
68	2019/03/27 09:14:40	43.4
69	2019/03/27 09:14:43	44.5
70	2019/03/27 09:14:46	41.7
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98	2019/03/27	09:16:10	57.3
99	2019/03/27	09:16:13	64.8
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105	2019/03/27	09:16:31	54.7
106	2019/03/27	09:16:34	49.1
107	2019/03/27	09:16:37	47.2
108	2019/03/27	09:16:40	46.2
109	2019/03/27	09:16:43	44.5
110	2019/03/27	09:16:46	42.4
111	2019/03/27	09:16:49	41.2
112	2019/03/27	09:16:52	39.6
113	2019/03/27	09:16:55	40.2
114	2019/03/27	09:16:58	39.8
115	2019/03/27	09:17:01	42.0
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119	2019/03/27	09:17:13	37.8
120	2019/03/27	09:17:16	38.2
121	2019/03/27	09:17:19	38.9
122	2019/03/27	09:17:22	40.7
123	2019/03/27	09:17:25	41.0
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125	2019/03/27	09:17:31	38.4
126	2019/03/27	09:17:34	37.0
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128	2019/03/27	09:17:40	43.5
129	2019/03/27	09:17:43	53.9
130	2019/03/27	09:17:46	59.1
131	2019/03/27	09:17:49	55.8
132	2019/03/27	09:17:52	55.2
133	2019/03/27	09:17:55	55.0
134	2019/03/27	09:17:58	54.9
135	2019/03/27	09:18:01	55.2
136	2019/03/27	09:18:04	55.5
137	2019/03/27	09:18:07	55.5
138	2019/03/27	09:18:10	55.5
139	2019/03/27	09:18:13	55.7
140	2019/03/27	09:18:16	55.5
141	2019/03/27	09:18:19	55.4
142	2019/03/27	09:18:22	55.3
143	2019/03/27	09:18:25	55.3
144	2019/03/27	09:18:28	55.3
145	2019/03/27	09:18:31	55.6
146	2019/03/27	09:18:34	55.4
147	2019/03/27	09:18:37	55.4
148	2019/03/27	09:18:40	55.3
149	2019/03/27	09:18:43	55.4
150	2019/03/27	09:18:46	55.4
151	2019/03/27	09:18:49	55.4
152	2019/03/27	09:18:52	55.1
153	2019/03/27	09:18:55	54.7
154	2019/03/27	09:18:58	55.0
155	2019/03/27	09:19:01	54.9
156	2019/03/27	09:19:04	54.8
157	2019/03/27	09:19:07	55.0
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165	2019/03/27	09:19:31	55.3
166	2019/03/27	09:19:34	55.4
167	2019/03/27	09:19:37	55.2
168	2019/03/27	09:19:40	55.1
169	2019/03/27	09:19:43	55.3
170	2019/03/27	09:19:46	55.4
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175	2019/03/27	09:20:01	55.8
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192	2019/03/27	09:20:52	55.0
193	2019/03/27	09:20:55	54.8
194	2019/03/27	09:20:58	54.6
195	2019/03/27	09:21:01	54.7
196	2019/03/27	09:21:04	55.0
197	2019/03/27	09:21:07	55.1
198	2019/03/27	09:21:10	55.4
199	2019/03/27	09:21:13	55.0
200	2019/03/27	09:21:16	55.6
201	2019/03/27	09:21:19	55.6

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/03/2020
Case Description: Redwood Tank Pipeline Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences on Country Club Dr	Residential	25.0	25.0	25.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	200.0	0.0
Excavator	No	40		80.7	200.0	0.0
Front End Loader	No	40		79.1	200.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Concrete Saw	77.5	70.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	77.5	72.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/03/2020
Case Description: Redwood Tank Water Tank and Pump Station Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Property Line	Residential	25.0	25.0	25.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	50.0	0.0
Grader	No	40	85.0		50.0	0.0
Excavator	No	40		80.7	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure.

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Vibratory Roller	0.21	94	0.050	25
Large bulldozer	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Vibratory Roller	25	0.2100	94	0.050
Large bulldozer	25	0.0890	87	0.022
Loaded trucks	25	0.0760	83	0.014
Jack hammer	25	0.0350	79	0.009
Small bulldozer	25	0.0030	58	0.001

Source
California Department of Transportation (Caltrans). 2013. Transportation and Construction Last Updated: 4/11/2019

Appendix F

AB 52 Letters

San Lorenzo Valley WATER DISTRICT

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

06/10/2020

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irene Zwierlein, Chairperson
789 Canada Road,
Woodside, California 94062

RE: AB 52 Consultation, San Lorenzo Valley Water District Redwood Park Tank Project, Ben Lomond, Santa Cruz County, California

Dear Chairperson Zwierlein:

The San Lorenzo Valley Water District (SLVWD) is preparing an Initial Study – Mitigated Negative Declaration for the proposed SLVWD Redwood Park Tank Project. The proposed project consists of the construction and operation of a new steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The new water storage tank would be 30 feet in diameter and 24 feet in height. In addition, approximately 400 linear feet of water pipeline would be constructed in Country Club Drive. The proposed project is subject to the California Environmental Quality Act.

A records search of the California Historic Resources Information System at the Northwest Information Center housed at Sonoma State University identified four previously conducted cultural resources studies and two previously identified cultural historic era resources within a 0.5-mile radius.

The proposed project must comply with California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), which requires local governments to conduct meaningful consultation with California Native American tribes that have requested to be notified by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of the Amah Mutsun Tribal Band is important to the SLVWD's planning process. Under AB 52, contacts are typically afforded 30 days to respond. However, under the recent executive order issued by Governor Newsom, all AB 52 deadlines are temporarily suspended until June 22, 2020. If you require any additional information or have any questions, please contact me at 831-430-4639 or via e-mail at CBLANCHARD@SLVWD.COM. Thank you for your assistance.

Sincerely,

Carly Blanchard
Environmental Planner
San Lorenzo Valley Water District

Enclosure: Project Location Map

San Lorenzo Valley WATER DISTRICT

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

06/10/2020

Amah Mutsun Tribal Band
Valentin Lopez, Chairperson
P.O. Box 5272
Galt, California

RE: AB 52 Consultation, San Lorenzo Valley Water District Redwood Park Tank Project, Ben Lomond, Santa Cruz County, California

Dear Chairperson Lopez:

The San Lorenzo Valley Water District (SLVWD) is preparing an Initial Study – Mitigated Negative Declaration for the proposed SLVWD Redwood Park Tank Project. The proposed project consists of the construction and operation of a new steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The new water storage tank would be 30 feet in diameter and 24 feet in height. In addition, approximately 400 linear feet of water pipeline would be constructed in Country Club Drive. The proposed project is subject to the California Environmental Quality Act.

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Carly Blanchard
Environmental Planner
San Lorenzo Valley Water District

Enclosure: Project Location Map

San Lorenzo Valley WATER DISTRICT

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

06/10/2020

Costanoan Ohlone Rumsen-Mutsun Tribe
Patrick Orozco, Chairman
644 Peartree Drive
Watsonville, California 95076

RE: AB 52 Consultation, San Lorenzo Valley Water District Redwood Park Tank Project, Ben Lomond, Santa Cruz County, California

Dear Chairman Orozco:

The San Lorenzo Valley Water District (SLVWD) is preparing an Initial Study – Mitigated Negative Declaration for the proposed SLVWD Redwood Park Tank Project. The proposed project consists of the construction and operation of a new steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The new water storage tank would be 30 feet in diameter and 24 feet in height. In addition, approximately 400 linear feet of water pipeline would be constructed in Country Club Drive. The proposed project is subject to the California Environmental Quality Act.

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Carly Blanchard
Environmental Planner
San Lorenzo Valley Water District

Enclosure: Project Location Map

San Lorenzo Valley WATER DISTRICT

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

06/10/2020

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, California 95024

RE: AB 52 Consultation, San Lorenzo Valley Water District Redwood Park Tank Project, Ben Lomond, Santa Cruz County, California

Dear Chairperson Sayers:

The San Lorenzo Valley Water District (SLVWD) is preparing an Initial Study – Mitigated Negative Declaration for the proposed SLVWD Redwood Park Tank Project. The proposed project consists of the construction and operation of a new steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The new water storage tank would be 30 feet in diameter and 24 feet in height. In addition, approximately 400 linear feet of water pipeline would be constructed in Country Club Drive. The proposed project is subject to the California Environmental Quality Act.

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Sincerely,

Carly Blanchard
Environmental Planner
San Lorenzo Valley Water District

Enclosure: Project Location Map

San Lorenzo Valley WATER DISTRICT

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

06/10/2020

Muwekma Ohlone Indian Tribe of the SF Bay Area
Charlene Nijmeh, Chairperson
20885 Redwood Road, Suite 232
Castro Valley, California 94546

RE: AB 52 Consultation, San Lorenzo Valley Water District Redwood Park Tank Project, Ben Lomond, Santa Cruz County, California

Dear Chairperson Nijmeh:

The San Lorenzo Valley Water District (SLVWD) is preparing an Initial Study – Mitigated Negative Declaration for the proposed SLVWD Redwood Park Tank Project. The proposed project consists of the construction and operation of a new steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The new water storage tank would be 30 feet in diameter and 24 feet in height. In addition, approximately 400 linear feet of water pipeline would be constructed in Country Club Drive. The proposed project is subject to the California Environmental Quality Act.

A records search of the California Historic Resources Information System at the Northwest Information Center housed at Sonoma State University identified four previously conducted cultural resources studies and two previously identified cultural historic era resources within a 0.5-mile radius.

The proposed project must comply with California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), which requires local governments to conduct meaningful consultation with California Native American tribes that have requested to be notified by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of the Amah Mutsun Tribal Band is important to the SLVWD's planning process. Under AB 52, contacts are typically afforded 30 days to respond. However, under the recent executive order issued by Governor Newsom, all AB 52 deadlines are temporarily suspended until June 22, 2020. If you require any additional information or have any questions, please contact me at 831-430-4639 or via e-mail at CBLANCHARD@SLVWD.COM. Thank you for your assistance.

Sincerely,

Carly Blanchard
Environmental Planner
San Lorenzo Valley Water District

Enclosure: Project Location Map

San Lorenzo Valley WATER DISTRICT

13060 Highway 9
Boulder Creek, CA 95006-9119
(831) 338-2153 phone
(831) 338-7986 fax

06/10/2020

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano
20885 Redwood Road, Suite 232
Castro Valley, California 94546

RE: AB 52 Consultation, San Lorenzo Valley Water District Redwood Park Tank Project, Ben Lomond, Santa Cruz County, California

Dear Ms. Arellano:

The San Lorenzo Valley Water District (SLVWD) is preparing an Initial Study – Mitigated Negative Declaration for the proposed SLVWD Redwood Park Tank Project. The proposed project consists of the construction and operation of a new steel water storage tank on a 6,530 square-foot parcel (Assessor's Parcel Number 078-233-05) located northwest of the intersection of Country Club Drive and Dundee Avenue in Ben Lomond, California. The new water storage tank would be 30 feet in diameter and 24 feet in height. In addition, approximately 400 linear feet of water pipeline would be constructed in Country Club Drive. The proposed project is subject to the California Environmental Quality Act.

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Sincerely,

Carly Blanchard
Environmental Planner
San Lorenzo Valley Water District

Enclosure: Project Location Map

Appendix G

Ben Lomond Fire Protection District Email

From: Stacie Brownlee [mailto:blfdchief@benlomondfd.com]
Sent: Tuesday, November 24, 2020 11:43 AM
To: Rick Rogers <rrogers@slvwd.com>
Cc: jfurtabo@slvwd.com
Subject: Country Club Water Tanks

Rick, I have viewed the project site at Country Club and Scenic. I see no issues with this project. This would be a hug benefit for the homeowners of Scenic and surrounding areas since you will be upgrading the tank and putting in a hydrant. As for the concerns with emergency traffic able to get through. Ben Lomond Fire will be in direct contact with the project manager and workers on scene. If we do have a emergency we will call immediately to the job foreman and have them clear the road for emergency traffic. If you need anything more let me know.

Thanks
Chief Stacie Brownlee
Ben Lomond Fire Protection District