FINAL
INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

for the

LOMPICO WATER TANKS REPLACEMENT PROJECT

SCH #2019109074

Prepared for:

San Lorenzo Valley Water District
13060 CA-9
Boulder Creek, CA 95006

Prepared by:

Denise Duffy & Associates
947 Cass Street, Suite 5
Monterey, CA 93940

December 2019

This Page Intentionally Left Blank

Table of Contents

This Page Intentionally Left Blank

Chapter 1. Introduction

1.1 BACKGROUND

This document, together with the Draft Initial Study/Mitigated Negative Declaration (Draft IS/MND), constitutes the Final Initial Study/Mitigated Negative Declaration (Final IS/MND) for the Lompico Water Tanks Replacement Project (project). The San Lorenzo Valley Water District (District) is the lead agency for the project. The Final IS/MND consists of an introduction, comment letters received during the 30-day public review period, responses to comments, and revisions to the Draft IS/MND, if deemed applicable. The Draft IS/MND was prepared to inform the public of the potential environmental effects of the project and identify possible ways to minimize potential project-related impacts.

1.2 PUBLIC PARTICIPATION

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15073(a), the Draft IS/MND was circulated for a 30-day review period during which comments could be submitted. On October 25, 2019, the Draft IS/MND was distributed for the public review period to responsible and trustee agencies, interested groups, and individuals. The review period ended on November 25, 2019. A SLVWD Board of Directors meeting is scheduled for December 5, 2019, to consider the adoption of the Final IS/MND and approval of the proposed project.

This Page Intentionally Left Blank

Chapter 2. Response to Comments

2.1 INTRODUCTION

This chapter includes comments received from the public and public agencies during the circulation of the Draft IS/MND. This section contains all information available in the public record related to the Draft IS/MND as of November 25, 2019. **Section 2.3** below responds to comments received during the review period.

2.2 LIST OF COMMENT LETTERS

The following is a list of comment letters/email comments received on the Draft IS/MND and the dates these letters were received:

Comment Letters

A.	State Clearinghouse, California Office of Planning and Research	November 26, 2019
B.	Santa Cruz County	November 6, 2019
C.	Debra Loewen	November 14, 2019

2.3 RESPONSE TO COMMENTS

Each letter received on the Draft IS/MND is presented in this chapter, as identified in **Section 2.2** above. Individual comments in each letter are numbered. Correspondingly numbered responses to each comment are provided in the discussion following the comment letter.

If comments raised environmental issues that required additions or deletions to the text, tables, or figures in the Draft IS/MND, a brief description of the change is provided, and the reader is directed to **Chapter 3, Revisions to the Draft IS/MND**. The comments received on the Draft IS/MND did not result in a "substantial revision" of the negative declaration, as defined by CEQA Guidelines §15073.5, and the new information added to the mitigated negative declaration merely clarifies, amplifies, or makes insignificant modifications to the IS/MND. No new significant effects were identified since the commencement of the public review period nor have project revisions been made.

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

November 26, 2019

Rick Rogers
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006

Subject: Lompico Water Tanks Replacement Project
SCH#: 2019109074

Dear Rick Rogers

The State Clearinghouse submitted the above named MND to selected state agencies for review. The review period closed on 11/25/2019, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act, https://ceqanet.opr.ca.gov/2019109074/2. 1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Letter A: Responses to State Clearinghouse, California Office of Planning and Research

Comment A-1: The State Clearinghouse submitted the above named MND to selected state agencies for review. The review period closed on 11/25/2019, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act, https://ceqanet.opr.ca.gov/2019109074/2.

Response A-1: The letter states that the State Clearinghouse submitted the Draft IS/MND to selected state agencies for review and identified that no state agencies submitted comments to the State Clearinghouse during the public review period. The letter further notes that the proposed project has complied with State Clearinghouse review requirements for draft environmental documents. No further response is required.

Letter B

From: Matt Johnston <Matt.Johnston@santacruzcounty.us>
Date: November 6, 2019 at 12:56:06 PM PST
To: "rrogers@slvwd.com" <rrogers@slvwd.com>
Subject: Water Tank Replacement MND Comments

Hi Rick,
I have been reading through the initial study and have a few comments; the first of which is the NOI does not identify the link to the document on line, instead it specifically says the document can be found at your office. I found it at your website, but in reading the NOI, I thought I'd have to come in to the SLVWD to review the initial study. I haven't checked upstairs, but I presume a copy is available at the Clerk of the Board as well. If not, you should probably recirculate the document. 1

MM Bio 1. – If the Kangaroo rat is present in the area around the Lewis tank, an educational card will do nothing to reduce impacts to this species. The K-rat is nocturnal. The primary threat from a project such as this is destruction of dens if habitat is going to be removed. I don't believe this to be the case at the Lewis tank site. The secondary threat is entrainment in open trenches. A typical mitigation would be to maintain a ramp into and out of any trenches left overnight, and/or ensuring critters cannot get into a trench by covering it with metal plates. Daily surveys to ensure no K-rats are in trenches can be done by the crew supervisor when trained by the project biologist. 2

MM Bio 3. – In the case where a nest must be removed, a permit is required from the CDFW prior to moving the nest, and specific protocols are required both to ensure success of the relocation, and to ensure there is no contamination spread from the nest to the folks moving them. The following is the direction we at the County were given by CDFW in regards to moving woodrats nests.

1. Prior to nest disturbance, the biologist shall obtain from CDFG a scientific collection permit for the trapping of the dusky-footed wood rats.
2. Nests shall be disturbed/dismantled only during the non-breeding season, between October 1 and December 31.
3. At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the wood rat nest location and locate any other nests that may have been built in the project vicinity that may be affected by the proposed development.
4. Prior to nest disturbance, wood rats shall be trapped at dusk of the night set for relocation of the nest(s).
5. Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s). 3

6. In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used.
7. Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing woodrat trails or toward other available habitat.
8. If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling.
9. Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted.
10. Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge.

3

MM Bio 6. Is identified as Appendix A, but is actually appendix E of Appendix A and very difficult to find. It would be more helpful and transparent to explain in the analysis of the initial study how the implementation of the emergency consultation will reduce the impacts to less than significant. The emergency consultation only states that it will minimize impacts, but not to what degree.

4

4.4.6 e) The County significant tree ordinance does not apply outside the coastal zone. There would be no requirement to obtain a permit to remove these trees.

5

Biotic species – no mention of bats, yet they may be present and bats listed by the western bat working group, as well as those listed by the state and federal ESAs, are protected and some mitigation should be provided regarding tree removal and removal of old structures. At a minimum, a survey for potential habitat on the redwood tanks and any trees proposed for removal.

Substitution of mitigation measures does not require recirculation if the measures are more stringent and provide better protection for the resource, however, should a survey for bat habitat find the potential for bats to occupy nooks on the old redwood tanks, new mitigations to address these impacts would trigger recirculation.

6

Matt Johnston
Environmental Coordinator
Principal Planner for Code Compliance
County of Santa Cruz
(831) 454-5357

Letter B: Responses to Santa Cruz County Planning Department

Comment B-1: I have been reading through the initial study and have a few comments; the first of which is the NOI does not identify the link to the document on line, instead it specifically says the document can be found at your office. I found it at your website, but in reading the NOI, I thought I'd have to come in to the SLVWD to review the initial study. I haven't checked upstairs, but I presume a copy is available at the Clerk of the Board as well. If not, you should probably recirculate the document.

Response B-1: In accordance with CEQA Guidelines Section 15072 (g)(4), an NOI "shall identify the address or addresses where copies of the proposed negative declaration or mitigated negative declaration are available for review" and that the location "be readily accessible to the public during the lead agency's normal working hours." The District followed the applicable CEQA requirements and recirculation of the IS/MND is not required.

Comment B-2: MM Bio 1. – If the Kangaroo rat is present in the area around the Lewis tank, an educational card will do nothing to reduce impacts to this species. The K-rat is nocturnal. The primary threat from a project such as this is destruction of dens if habitat is going to be removed. I don't believe this to be the case at the Lewis tank site. The secondary threat is entrainment in open trenches. A typical mitigation would be to maintain a ramp into and out of any trenches left overnight, and/or ensuring critters cannot get into a trench by covering it with metal plates. Daily surveys to ensure no K-rats are in trenches can be done by the crew supervisor when trained by the project biologist.

Response B-2: The commenter identifies the potential for Santa Cruz kangaroo rat (*Dipodomys venustus venustus*) to occur within the project site at the Lewis Tank site and suggests additional mitigation measures be included. Potentially significant impacts to this species were identified in the IS/MND in Section 4.4.6, Page 40. Mitigation measure BIO 1 (Section 4.4.6, Page 4) was identified to mitigate the potentially significant impacts to less than significant. While the impact analysis and subsequent mitigation described in the IS/MND is adequate, the District agrees to incorporate the commenter's suggested additional measures. Per CEQA Guidelines Section 15073.5(c)(1) the additional mitigation measures are equivalent or more effective than the original mitigation measure, therefore, recirculation of the document is not required. The additional measures are presented as text changes in Chapter 3 below.

Comment B-3: MM Bio 3. – In the case where a nest must be removed, a permit is required from the CDFW prior to moving the nest, and specific protocols are required both to ensure success of the relocation, and to ensure there is no contamination spread from the nest to the folks moving them. The following is the direction we at the County were given by CDFW in regards to moving woodrats nests.

1. Prior to nest disturbance, the biologist shall obtain from CDFG a scientific collection permit for the trapping of the dusky-footed wood rats.

2. Nests shall be disturbed/dismantled only during the non-breeding season, between October 1 and December 31.

3. At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the wood rat nest location and locate any other nests that

may have been built in the project vicinity that may be affected by the proposed development.

4. Prior to nest disturbance, wood rats shall be trapped at dusk of the night set for relocation of the nest(s).

5. Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).

6. In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used.

7. Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing woodrat trails or toward other available habitat.

8. If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling.

9. Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted.

10. Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge.

Response B-3: The commenter identifies that typically SFDW nest removal, if necessary, would require a permit from the California Department of Fish and Wildlife (CDFW). Additionally, the commenter states that specific protocols are necessary to ensure the success of relocation and that no contamination is spread from the SDFW nest to the personnel tasked with relocation. While the impact analysis and subsequent mitigation described in the IS/MND is adequate, the District agrees to incorporate the commenter's suggested additional measures. Per CEQA Guidelines Section 15073.5(c)(1) the additional mitigation measures are equivalent or more effective than the original mitigation measure, therefore recirculation of the document is not required. The additional measures are presented as text changes in Chapter 3 below.

Comment B-4: MM Bio 6. Is identified as Appendix A, but is actually appendix E of Appendix A and very difficult to find. It would be more helpful and transparent to explain in the analysis of the initial study how the implementation of the emergency consultation will reduce the impacts to less than significant. The emergency consultation only states that it will minimize impacts, but not to what degree.

Response B-4: The commenter identifies a reference to Appendix A, which should be described as Appendix E of Appendix A. Additionally the commenter requests that the impacts analysis and measures included in the consultation be transferred to the body of the IS/MND to provide a more transparent explanation. Chapter 4, Section 4.4.6, Page 42, includes a statement of the significance of the Project impacts on this species as well as a statement

identifying that the implementation of the measures included in Appendix E of Appendix A will reduce that potentially significant impact to less than significant. This comment is noted and edits to the IS/MND for clarity are presented in Chapter 3 below.

Comment B-5: 4.4.6 e) The County significant tree ordinance does not apply outside the coastal zone. There would be no requirement to obtain a permit to remove these trees.

Response B-5: This comment is noted; the impact analysis has been modified to indicate that a tree removal permit would not be required as presented in Chapter 3 below.

Comment B-6: Biotic species – no mention of bats, yet they may be present and bats listed by the western bat working group, as well as those listed by the state and federal ESAs, are protected and some mitigation should be provided regarding tree removal and removal of old structures. At a minimum, a survey for potential habitat on the redwood tanks and any trees proposed for removal.

Substitution of mitigation measures does not require recirculation if the measures are more stringent and provide better protection for the resource, however, should a survey for bat habitat find the potential for bats to occupy nooks on the old redwood tanks, new mitigations to address these impacts would trigger recirculation.

Response B-6: The commenter identifies that the document does not discuss the potential for special-status bat species to be impacted by the project. A list of special-status species with the potential to occur is provided in Appendix A of the IS/MND. This was generated by evaluating the following data sources: current agency status information from the Service and CDFW for species listed, proposed for listing, or candidates for listing as Threatened or Endangered under the federal Endangered Species Act (ESA) or California Endangered Species Act (CESA) and those considered CDFW "species of special concern" (Service 2019 and CDFW 2019b); the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2019); and CNDDB occurrence reports from the United States Geological Survey (USGS) Felton quadrangle and the seven surrounding USGS quadrangles (Big Basin, Castle Rock Ridge, Los Gatos, Laurel, Soquel, Santa Cruz, and Davenport).

From these sources the following bat species were identified as having the potential to occur within the survey area: Pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and hoary bat (*Lasiurus cinereus*) (Bio Report Appendix C). During the survey effort, DD&A conducted reconnaissance-level surveys for bat roosts and characterized the habitat for the species identified. No sign of roosting bats was observed, and suitable habitat was not identified within the project impact area. While there are buildings at the Lewis Tank Site, disturbance associated with the District's operations dismisses these as potential habitats. The tanks themselves did not represent suitable habitat. As described above, special status bat species were considered, and the habitat surveyed as part of the biological investigation for the project. The impact analysis is adequate, and no new impacts have been introduced; therefore, recirculation is not required.

Letter C

Rick Rogers, District Manager
San Lorenzo Valley Water District
13060 Highway 9, Boulder Creek, CA 95006

November 14, 2019

Comment on Initial Study/Mitigated Negative Declaration: Lompico Water Tanks Replacement

I would like to thank and support the board and district for proceeding with this very important project of replacing six tanks in Lompico as per the Assessment District merger agreement.

I have three areas of concern and comment on the documents.

1. The number of tanks, locations, and total volume of the original storage in Lompico has not been stated correctly. Specifically, there were two 100k (nominal) Lewis tanks, on two different sites and APNs; one has not been described and included in the document. The second tank was removed shortly before the merger as a State requirement due to an excess of leaks, but it is in the original design calculations and is also included in the Assessment for replacement of six tanks, not five as per the document. The other sites – Kaski and Madrone - originally had two tanks each 60k gallons (nominal) and seem to be correctly stated. There may also be a problem with the size of replacement tanks described, since the numbers have been presented differently, but with the total volume (nominal) as I understand increased from 440k to 460k. I appreciate that being looked at and confirmed, or corrected as needed. The number of tanks, locations, and volume existing and to be replaced is of concern for accuracy for assessment payers, and to help ward off bouts of misinformation by those not familiar with Lompico. 1
2. The document describes each of the three tank sites, two tanks each, of having a full perimeter fence with area inside to be fully paved. Sites are currently not fully paved, and I am concerned that the increase of hard surface and runoff has not been adequately addressed, including moving both Lewis tanks to one APN. The document states water will be directed to a man-made swale for groundwater recharge, while also noting that the area is on impervious sandstone which will not accept recharge. The geotechnical report says to not allow concentrated drainage, and to not allow water to go downhill, while tanks sites are all in elevated areas. At the same time, the geotechnical report advises against use of pervious paving materials to avoid saturation. Having attended Resource Conservation District workshops on managing runoff, and being aware of County ordinances, I am concerned that streets and homes below are not impacted by the additional hard surfaces, as it is a chronic problem when drain patterns are changed, and appreciate further assurance that a solution is included. 2
3. The Lewis tank is listed as being served by the Ben Lomond fire district, while Kaski and Madrone sites as served by Zayante Fire. I believe all are under Zayante Fire jurisdiction. 3

Thank you for your response and attention. I've provided some of the references, following.

Debra Loewen,
Lompico Canyon
Mail: PO Box 66165, Scotts Valley CA 95067

References* for questions and comments

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION for the LOMPICO WATER TANKS REPLACEMENT PROJECT 10a.2 vol 1, October 7, 2019 Duffy and Associates
Pages reference report with digital copy page number in parenthesis.

1. Page 1 (5), item 5; the project is to replace three tanks; item 9 clarifies 2 tanks each site
2. Page 1 (5), item 8: 2x60k Kaski and Madrone sites; 2x110k to replace one 100k at Lewis
3. Page 4 (8), Project Location 1.2, Lewis: describes only one parcel and one existing tank; does not mention second parcel and separate site of second Lewis tank (existing, removed)
4. Page 57 (61) 4.10 Hydrology: "the site will be completely covered by impervious material within the fence line" drain swales added. (note Pacific Crest geotechnical opinion against using pervious materials in their report, following) Item C et al: Impacts for altering drainage pattern , runoff, siltation listed as "less than significant".
5. Page 59 (63) b: water will be directed into a man-made swale – for groundwater recharge?
6. Page 67 (71) 4.15.1 Public Services: Kaski & Madrone served by Zayante FD; Lewis is served by Ben Lomond FD

Appendices to the INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION for the LOMPICO WATER TANKS REPLACEMENT PROJECT October 7, 2019 vol 2 Duffy & Assoc.

Appendix A Biological Resources
Page 4 (9) Lewis tank site: describes only one parcel one tank (as above)

Appendix B Geotechnical Pacific Crest
Page 2 (135) – refers to Lewis site as one tank 100k existing, to be "likely" replaced by two
Page 20 (153) item 62f: pervious paving is not recommended to due potential for saturation
Page 20 (153) Surface Drainage item 64: "Slope failures can occur where surface drainage is allowed to concentrate onto unprotected slopes. Improvements to the surface drainage around the project area is important to reduce potential for shallow slumping of slopes. Erosion control measures should be implemented and maintained. Under no circumstances should surface runoff be directed toward, or discharged upon, any topographic slopes."

- Not complete, ie: tank size and locations are cited throughout both documents, not all references may be included.

Letter C: Responses to Debra Loewen

Comment C-1: The number of tanks, locations, and total volume of the original storage in Lompico has not been stated correctly. Specifically, there were two 100k (nominal) Lewis tanks, on two different sites and APNs; one has not been described and included in the document. The second tank was removed shortly before the merger as a State requirement due to an excess of leaks, but it is in the original design calculations and is also included in the Assessment for replacement of six tanks, not five as per the document. The other sites – Kaski and Madrone - originally had two tanks each 60k gallons (nominal) and seem to be correctly stated. There may also be a problem with the size of replacement tanks described, since the numbers have been presented differently, but with the total volume (nominal) as I understand increased from 440k to 460k. I appreciate that being looked at and confirmed or corrected as needed. The number of tanks, locations, and volume existing and to be replaced is of concern for accuracy for assessment payers, and to help ward off bouts of misinformation by those not familiar with Lompico.

Response C-1: To clarify, the Lompico system had two Lewis Tanks at two different elevations. The higher tank was removed before the merger. Since the removal of this tank was completed prior to the project and the project will not disturb the old tank site, analysis of resources at the old tank site are not required. The total tank capacity has slightly increased to add more fire/emergency storage. This does not change the analysis or conclusions in the IS/MND.

Comment C-2: The document describes each of the three tank sites, two tanks each, of having a full perimeter fence with area inside to be fully paved. Sites are currently not fully paved, and I am concerned that the increase of hard surface and runoff has not been adequately addressed, including moving both Lewis tanks to one APN. The document states water will be directed to a man-made swale for groundwater recharge, while also noting that the area is on impervious sandstone which will not accept recharge. The geotechnical report says to not allow concentrated drainage, and to not allow water to go downhill, while tanks sites are all in elevated areas. At the same time, the geotechnical report advises against use of pervious paving materials to avoid saturation. Having attended Resource Conservation District workshops on managing runoff, and being aware of County ordinances, I am concerned that streets and homes below are not impacted by the additional hard surfaces, as it is a chronic problem when drain patterns are changed, and appreciate further assurance that a solution is included.

Response C-2: The commenter's concerns are acknowledged. To clarify, the project engineer and hydrologist, Schaaf & Wheeler, have indicated that the Lewis Tank site is approximately 75 feet of sand over fractured shale (per the well log for the on-site well), so the ground will absorb any volume of runoff. The District is also removing the treatment building so the added impervious area is minimized. Schaaf & Wheeler have indicated that the existing water tank has been leaking steady for years without water running off-site. No curb is proposed on the site, so runoff will sheet flow to the perimeter and percolate. Only the drain inlets for the tank overflow feed the percolation depression, so it will rarely receive concentrated flow.

The Kaski site has shallow bedrock and saturated topsoil, as can been seen with the current tank leakage running down the hillside. Replacing the tanks will allow the local soils to dry

out so they can absorb the runoff when it occurs. The only concentrated outlets are the tank drains, and those are where the existing drains are located. If the District were to ever drain the tank, the District will need to limit the flow to prevent scour.

Madrone is located at the crest of the hill, and storm water will run-off in all directions into unpaved areas. The only concentrated outlets are the tanks drains, with the same need to limit flows during tank draining.

Comment C-3: The Lewis tank is listed as being served by the Ben Lomond fire district, while Kaski and Madrone sites as served by Zayante Fire. I believe all are under Zayante Fire jurisdiction.

Response C-3: All of Lompico is in the Zayante Fire District, but the Lewis Tank Site is just outside the boundary. The text of the IS/MND is revised to correctly indicate that the Lewis Tank Site is located within the Zayante Fire District not the Ben Lomond Fire District, as presented in Chapter 3 below.

This Page Intentionally Left Blank

Chapter 3 Revisions to the Draft IS/MND

The following section includes revisions to the text of the Draft IS/ND, in amendment form. The revisions are listed numerically by page number. All additions to the text are shown underlined and all deletions from the text are shown in ~~strikethrough~~.

Chapter 4. Initial Study Environmental Checklist

Section 4.4.6 Explanation, Page 40 has been amended as follows:

MM BIO 1A. The District shall ensure that a qualified biologist conducts an education program for all persons employed on the project prior to performing construction activities. Instruction shall consist of a presentation by the qualified biologist that includes a discussion of the biology and general behavior of any special-status species that may be in the area, how they may be encountered within the work area, and procedures to follow when they are encountered. The status of ESA/CESA-listed species including legal protection, penalties for violations and project-specific protective management measures shall be discussed. The District shall prepare and distribute wallet-sized cards or a factsheet handout containing this information for workers to carry on-site. Upon completion of the program, employees shall sign an affidavit stating they attended the program and understand all protection measures.

MM BIO 1B. To prevent the inadvertent entrapment of Santa Cruz kangaroo rats during construction, all excavated, steep-walled holes or trenches more than 2 feet deep shall be covered with plywood or similar materials at the close of each working day, or escape ramps constructed of earth fill or wooden planks shall be positioned within the excavations to allow special-status wildlife to escape on their own. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. Inspections shall be conducted by qualified biologist or construction personnel that have been specifically identified and trained by the qualified biologist. If trapped animals are observed, escape ramps or structures shall be installed immediately to allow escape. Trapped wildlife shall only be handled by a qualified biologist, if necessary.

Section 4.4.6 Explanation, Page 40 has been amended as follows:

MM BIO 3. In the event that a SFDW nest is found, and assuming the nest is of the SFDW sub-species, one of the following measures will be implemented. These measures are listed in order of priority, where the first measure is the preferred measure to be implemented as it provides the least amount of impact to the woodrat. If the first measure cannot be implemented due to extenuating site conditions, the second shall be implemented and so forth down the list.

1. The development will be rerouted/re-sited if possible, to avoid the woodrat nest by at least 50 feet.
2. Safety and/or silt fencing will be erected around all nests within 25 feet of the grading and construction activities to avoid impacts during site work.
3. In the event that the project footprint must go directly through a nest, ~~the District shall dismantle the nest and replace the materials outside of the project impact area. Nests~~

~~shall be moved in the early morning during the non-breeding season (October through February), if possible.~~ the District shall trap SFDW, dismantle, and relocate nests using the following methodology:

- Prior to nest disturbance, the biologist shall obtain from CDFG a scientific collection permit for the trapping of the SFDW.
- Nests shall be disturbed/dismantled during the non-breeding season, between October 1 and December 31, if possible.
- At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the SFDW nest location and locate any other nests that may have been built in the project vicinity that may be affected by the proposed development.
- Prior to nest disturbance, SFDW shall be trapped at dusk of the night set for relocation of the nest(s).
- Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).
- In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the woodrats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used.
- Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing SFDW trails or toward other available habitat.
- If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling.
- Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the SFDW and far enough away from the construction activities that they will not be impacted.
- SFDW that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for SFDW to find refuge.

Section 4.4.6 Explanation, Page 42 has been amended as follows:

These impacts to MHJB habitat are considered "take" under ESA and would be significant impacts under CEQA. These significant impacts can be reduced to less than significant with the implementation of Mitigation Measure BIO 1A and BIO 6-13.

Mitigation

MM BIO 6. ~~The District will implement all Avoidance and Minimization Measures and Restoration Measures as detailed in the attached *Emergency Endangered Species Act Consultation for the San Lorenzo Valley Water District Lewis Tank Site* (**Appendix A**).~~ Prior to construction, implement a construction fencing plan that demarcates construction access routes and staging areas such that inadvertent

impacts to suitable habitat for MHJB are avoided. Install construction fencing prior to work and maintain fencing throughout the construction period.

MM BIO 7 The District will salvage the soil within the approximately 0.11-acre area proposed for use by the temporary tanks that has not already been salvaged for Ben Lomond spineflower restoration (A&MM 3). Topsoil (top 6-8 inches) will be carefully removed by an experienced operator using a dragline, excavator, scraper, or dozer and will be stockpiled in uncompacted piles less than 4 feet tall. Stockpiled soils will be placed on top of an impervious surface, such as a tarp, within temporary disturbance areas. Topsoil stockpiles will be stabilized by spraying with a tackifier (soil stabilizer) or covered with a permeable natural material, such as jute or coconut fiber blankets, as consistent with SWPPP requirements. To minimize compaction, no equipment will be allowed to travel over or park on the salvaged soil stockpiles (see MM BIO 13).

MM BIO 8 Implement Worker Environmental Awareness Training: A qualified biologist will conduct training sessions to familiarize all construction personnel with the following: identification of MHJB, other protected wildlife and plants, as well as their habitat, general provisions and protections afforded by the Endangered Species Act (ESA), measures implemented to protect the species, penalties for violation of the ESA, reporting requirements, and a review of project footprint boundaries. the District and/or their contractor(s) will require all construction employees to participate in the training prior to working on-site.

MM BIO 9 If ground disturbing activities are conducted during the flight season of the MHJB, cover exposed soil nightly to avoid impacts to dispersing males. Adult male Mount Hermon June beetles actively search for mates and breed during the evenings for approximately 12-14 weeks between May 1 and August 30. During this period, males and females may burrow into duff and soils at relatively shallow depths for protection during the daytime hours. Every attempt will be made to conduct soil disturbing aspects of the project outside of the adult flight season (May to August). If construction occurs during any part of the flight season, tarps or other impervious material will be used to cover open soil each night by 7:00 p.m. This will prevent adult males from burrowing into the exposed area and then being impacted by subsequent soil disturbance (digging, grading, or covering).

MM BIO 10 A qualified biologist will be on site during all ground-disturbing activities to capture any MHJB observed in the construction areas and relocate them outside to intact sandhills habitat that supports appropriate soils and vegetation.

MM BIO 11. To quantify the incidental take at the end of the project, a qualified biologist will calculate the area of soil disturbance (and thus incidental take) and count the number of MHJB that were observed during tank installation.

MM BIO 12. To compensate for impacts to MHJB habitat impacts at the Lewis Tank site the District will set aside 28,850.64 ft^2 (0.67-acre) of habitat within the 6.7-acre conservation area at the Olympia Wellfield. Setting aside 21,788.94 ft^2 (0.51-acre) of habitat within the conservation area will offset the permanent habitat loss at a 3:1 ratio, which is appropriate given the moderate quality of habitat at the site. The temporary impacts of this project will be compensated for at a 1:1 ratio, which reflects the fact that the habitat to be impacted on site will be restored following the project. Prior to initiation of ground-disturbing activities associated with the

project, the District will contribute $94,918.61 to the endowment that it will use to manage and monitor the 6.7-acre conservation area.

MM BIO 13. Following completion of the project, the District will restore the estimated 0.08-acre area of temporary disturbance that is outside of the existing fence line and access road, at the Lewis Tank site. Restoration activities will occur for three years, to enable native plant regeneration to occur. The restoration is anticipated to include dispersal of any site-collected Ben Lomond spineflower seed and salvaged topsoil (A&MM 3 and 5) into the non-road portions of the temporary disturbance area.

The District will work with a qualified biologist to develop a more detailed proposal for review by the Service that outlines the specific habitat restoration and monitoring activities. The proposal will also include updating the Sandhills Projects database that the District created to help the Service and others track Sandhills conservation and mitigation projects, to include this and other sandhills conservation and mitigation projects that have been conducted since the database was created and submitted to the Service in 2014.

Special -Status Plant Species

Three special-status plant species, silverleaf manzanita, Ben Lomond spineflower, and Ben Lomond buckwheat, were identified during focused botanical surveys at the Lewis Tank site (**Figure 6c**). Construction activities, including grading and vegetation removal, could impact these special-status plants species, these impacts would be considered significant. These significant impacts can be reduced to less than significant with the implementation of Mitigation Measures BIO 1A and BIO ~~6~~14-16.

MM BIO 14. Prior to construction, implement a construction fencing plan that demarcates construction access routes and staging areas such that inadvertent impacts to special-status plant species are avoided. Install construction fencing prior to work and maintain fencing throughout the construction period.

MM BIO 15. During the summer prior to construction, if possible, a qualified biologist will collect seed of all the Ben Lomond spineflower plants from within the project impact area, for use in restoration (see MM BIO 13).

MM BIO 16. For all mapped Ben Lomond spineflower populations that cannot be avoided during installation of the temporary storage tanks or implementation of the larger tank replacement project, and have already desiccated beyond the ability to collect seed, topsoil shall be salvaged for use in restoration efforts, post-project.

a) Topsoil (top 6-8 inches) will be carefully removed by an experienced operator using a dragline, excavator, scraper, or dozer and will be stockpiled in uncompacted piles less than 4 feet tall. Stockpiled soils will be placed on top of an impervious surface, such as a tarp, within temporary disturbance areas. Topsoil stockpiles will be stabilized by spraying with a tackifier (soil stabilizer) or covered with a permeable natural material,

such as jute or coconut fiber blankets, as consistent with SWPPP requirements. To minimize compaction, no equipment will be allowed to travel over or park on the salvaged soil stockpiles (see MM BIO 13).

b) Areas within the existing fence line of the Lewis Tank site are dominated by non-native invasive plant species. To reduce the potential for these species to cultivate new areas, this measure does not apply to Ben Lomond spineflower populations within the existing fence line of the Lewis Tank site.

Section 4.4.6 Explanation, Page 42, has been amended as follows:

a) **Less Than Significant Impact with Mitigation Incorporated**. The proposed project would result in impacts to sensitive habitats, described above, as defined in Chapter 16.32.040 of the Santa Cruz County code. These impacts would be considered significant, the implementation of Mitigation Measure BIO 6 will reduce these impacts to less than significant.

~~The project plans identify the removal of four (4) trees, two (2) at the Kaski tank site and two (2) at the Madrone tank site. Prior to construction the District will determine if any of the trees planned for removal are considered significant as defined in Chapter 16.34.030 of Santa Cruz County code. If any of the trees planned for removal are determined to be significant, the District will follow the standard conditions for a significant tree removal permit as defined in Santa Cruz County code Chapter 16.34.~~

Section 4.15.1 Environmental Setting, **Page 67**, the first paragraph has been amended as follows:

The project would be operated and maintained by the SLVWD. All of the ~~The Kaski and Madrone~~ tank sites are served by the Zayante Fire Protection District.~~, the Lewis tank site is served by the Ben Lomond Fire Protection District~~.

This Page Intentionally Left Blank

Attachment A.

SAN LORENZO VALLEY WATER DISTRICT LOMPICO WATER TANKS REPLACEMENT PROJECT REVISED BIOLOGICAL RESOURCES REPORT

SAN LORENZO VALLEY WATER DISTRICT
LOMPICO WATER TANKS REPLACEMENT PROJECT
BIOLOGICAL REVISED RESOURCES REPORT

August 2019
Revised December 2019

Prepared for

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

Prepared by

Denise Duffy & Associates, Inc
947 Cass Street, Suite 5
Monterey, CA 93940

Contact: Matthew Johnson
(831) 373-4341

This page left intentionally blank

TABLE OF CONTENTS

FIGURES

APPENDIX

INTRODUCTION

Denise Duffy & Associates, Inc. (DD&A) was contracted by Schaaf and Wheeler Consulting Civil Engineers to prepare a Biological Resources Report for San Lorenzo Valley Water District (District) Lompico Water Tanks Replacement Project (project). The project is located at three distinct locations in Santa Cruz County (**Figure 1**). The purpose of the project is to replace existing redwood water tanks with steel tanks. Descriptions of each project component are provided below. Project plans are included in **Appendix A**.

The analysis presented in this report describes the existing biological resources within the survey areas, which consisted of all potentially impacted areas at each tank location, including identification of any special-status species and sensitive habitats known to occur or with the potential to occur within the survey areas. The report also provides recommended avoidance, minimization, and mitigation measures. In addition, the report includes an overview of applicable federal, state, and local regulation, regulatory and responsible agencies with jurisdiction over sensitive resources within the survey areas, and the relevant permits that may be required.

Project Components

Kaski Tank Site

The Kaski tank site (Kaski tank) is located southeast of Lompico, California in Santa Cruz County (Assessor's Parcel Number [APN] 074-261-09) (**Figure 1**). Existing infrastructure consists of two 60,000-gallon redwood tanks, surrounded by chain link fencing, with an access/staging area on the southern boundary. The existing redwood tanks have been compromised and are currently leaking water. The Kaski tank project component would remove all existing facilities, regrade the site, and replace the existing tanks with two 60,000-gallon steel tanks (**Appendix A**).

Lewis Tank Site

The Lewis tank site (Lewis tank) is located southwest of Lompico, California in Santa Cruz County (APN 075-311-06) (**Figure 1**). Existing infrastructure consists of one 100,000-gallon redwood water tank and multiple historic water processing infrastructure components. The Lewis tank site is surrounded by chain link fence, and a driveway/staging area is located along the western boundary. The existing redwood tank has been compromised and is currently leaking water. The Lewis tank project component would remove all existing facilities, regrade the site, and replace the existing redwood tank with two 60,000-gallon steel tanks (**Appendix A**).

Madrone Tank Site

The Madrone tank site (Madrone tank) is located northeast of Lompico, California (**Figure 1**), in Santa Cruz County (APN's 075-072-14 and 075-072-15). Existing infrastructure consists of two 60,000-gallon redwood water tanks, with a perimeter chain link fence, and a driveway/staging area entering from the west. The existing tanks have been compromised and are currently leaking water. The Madrone tank project component would remove all existing facilities and infrastructure, regrade the property, and replace the existing redwood tanks with two 60,000-gallon steel tanks.

Summary of Results

Kaski Tank Site

Two vegetation types[1] were observed within the Kaski tank survey area: mixed evergreen and ruderal/disturbed (**Figure 2a)**. The canopy associated with mixed evergreen is dominated by redwood (*Sequoia sempervirens*). Several other tree species are present at less dominant distributions, including California bay (*Umbellularia californica*), madrone (*Arbutus menziesii*), toyon (*Heteromeles arbutifolia*), Douglas fir (*Pseudotsuga menziesii* var. *menziesii*), and coast live oak (*Quercus agrifolia*). The understory is mostly bare ground or covered with duff. Sparse vegetation found within the understory includes sword fern (*Polystichum munitum*), wood fern (*Woodwardia fimbriata*), California rose (*Rhododendron macrophyllum*), snowberry (*Symphoricarpos* sp.), poison oak (*Toxicodendron diversilobum*) and blackberry (*Rubus armeniacus*). No vegetation is present within the access road. A complete list of plants observed during the site visit is provided in **Appendix B.**

Lewis Tank Site

Two vegetation types were observed within the Lewis tank survey area: silverleaf manzanita (*Arctostaphylos silvicola*) chaparral and ruderal/disturbed (**Figure 2b)**. The site is dominated by herbaceous plants including primarily exotic annual grasses and forbs including redstem filaree (*Erodium cicutarium*), rattail fescue (*Festuca myuros*), smooth cat's ears (*Hypochaeris glabra*), and ripgut brome (*Bromus diandrus*). The area surrounding the Lewis tank site is occupied by silverleaf manzanita chaparral, a plant community found within the sandhills ecosystem on Zayante soils in central Santa Cruz County (McGraw 2016). Shrubs within the Lewis tank site include silverleaf manzanita, deer weed (*Acmispon glaber*), silver bush lupine (*Lupinus albifrons var. albifrons*), and yerba santa (*Eriodictyon californicum*). A complete list of plants observed during the site visit is provided in **Appendix B.**

Madrone Tank Site

Two vegetation types were observed within the Madrone tank survey area: mixed evergreen and ruderal/disturbed (**Figure 2c)**. The canopy associated with mixed evergreen is dominated by redwood. Several other tree species are present at less dominant distributions, including California bay, madrone, toyon, Douglas fir, and coast live oak. The understory is mostly bare ground or covered with duff. Sparse vegetation found within the understory includes sword fern, wood fern, California rose, snowberry, poison oak and blackberry. No vegetation is present within the access road. A complete list of plants observed during the site visit is provided in **Appendix B.**

Special-Status Wildlife Species

Several special-status species are known or have the potential to occur within or adjacent to the survey area. All other species evaluated are assumed "unlikely to occur" or were determined "not present" within the survey area. Species-specific reasons for likelihood of occurrence is presented in **Appendix C**. Special-status wildlife species that are known, or have a moderate to high potential to occur within or adjacent to the survey area include:

[1] A third classification for ground cover was also observed at all tank sites; developed. This ground cover type consists of the existing water supply infrastructure and other impervious areas (cement/pavement).

Kaski and Madrone Tank

- San Francisco Dusky-Footed Woodrat (SFDW, *Neotoma fuscipes annectens*) – CSC[2];
- Cooper's Hawk (*Accipiter cooperii*) – WL;

Lewis Tank

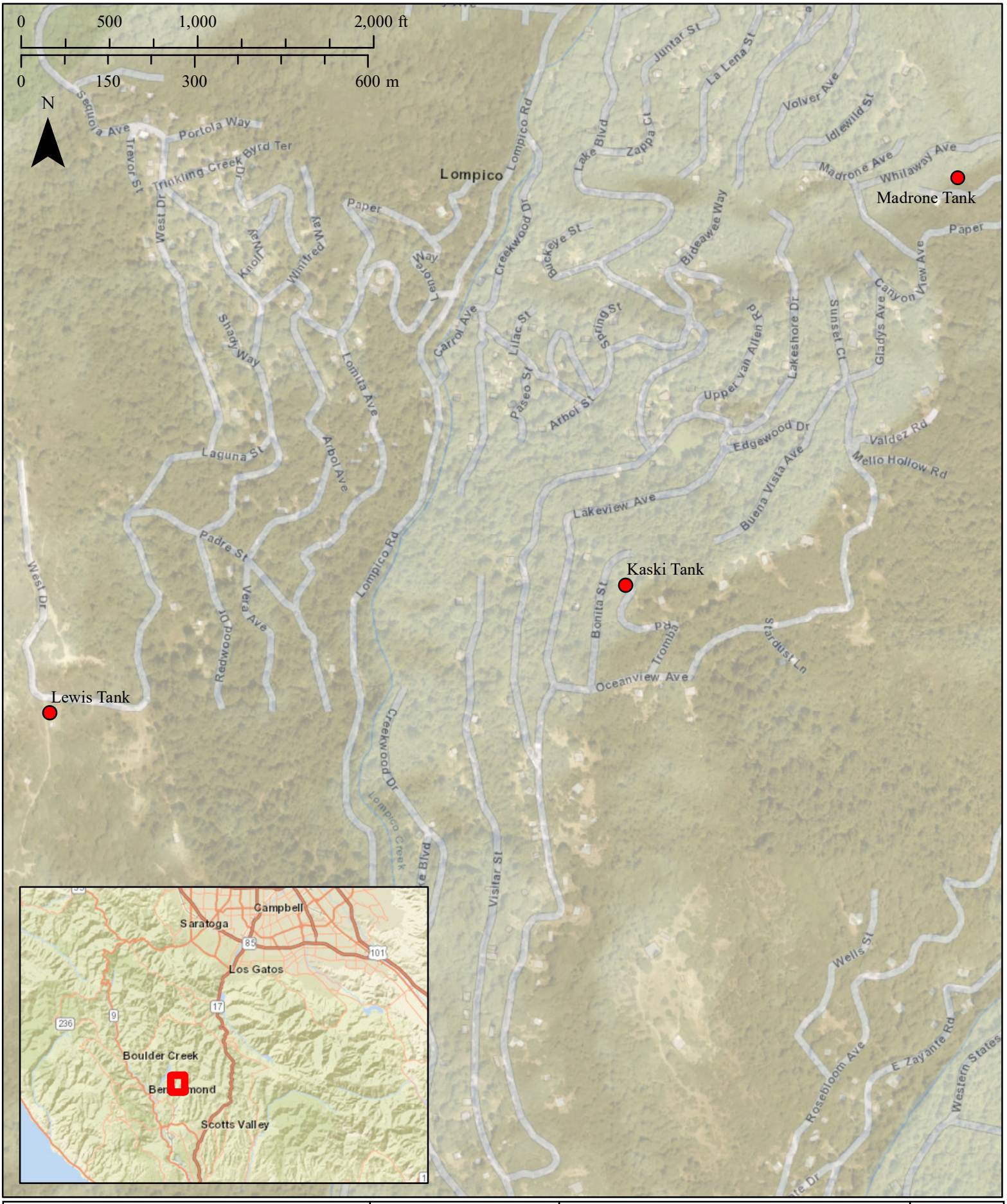
- Santa Cruz Kangaroo Rat (*Dipodomys venustus venustus*) – CNDDB;
- SFDW;
- Cooper's Hawk;
- Mount Hermon June Beetle (MHJB, *Polyphylla barbata*) – FE.

Special-Status Plant Species

The following special-status plant species are known, or have a moderate to high potential to occur within or adjacent to the Lewis tank survey area:

- Silverleaf Manzanita – 1B;
- Ben Lomond Spineflower (*Chorizanthe pungens var. hartwegiana*) – FE/1B; and
- Ben Lomond Buckwheat (*Eriogonum nudum var. decurrens*) – 1B.

[2] FE: Federally Endangered under the federal Endangered Species Act (ESA); CSC: CDFW Species of Concern; 1B: California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1B species; 4: CNPS CRPR 4; CNDDB: California Natural Diversity Database Occurrence (CNDDB); WL: CDFW Watch List.



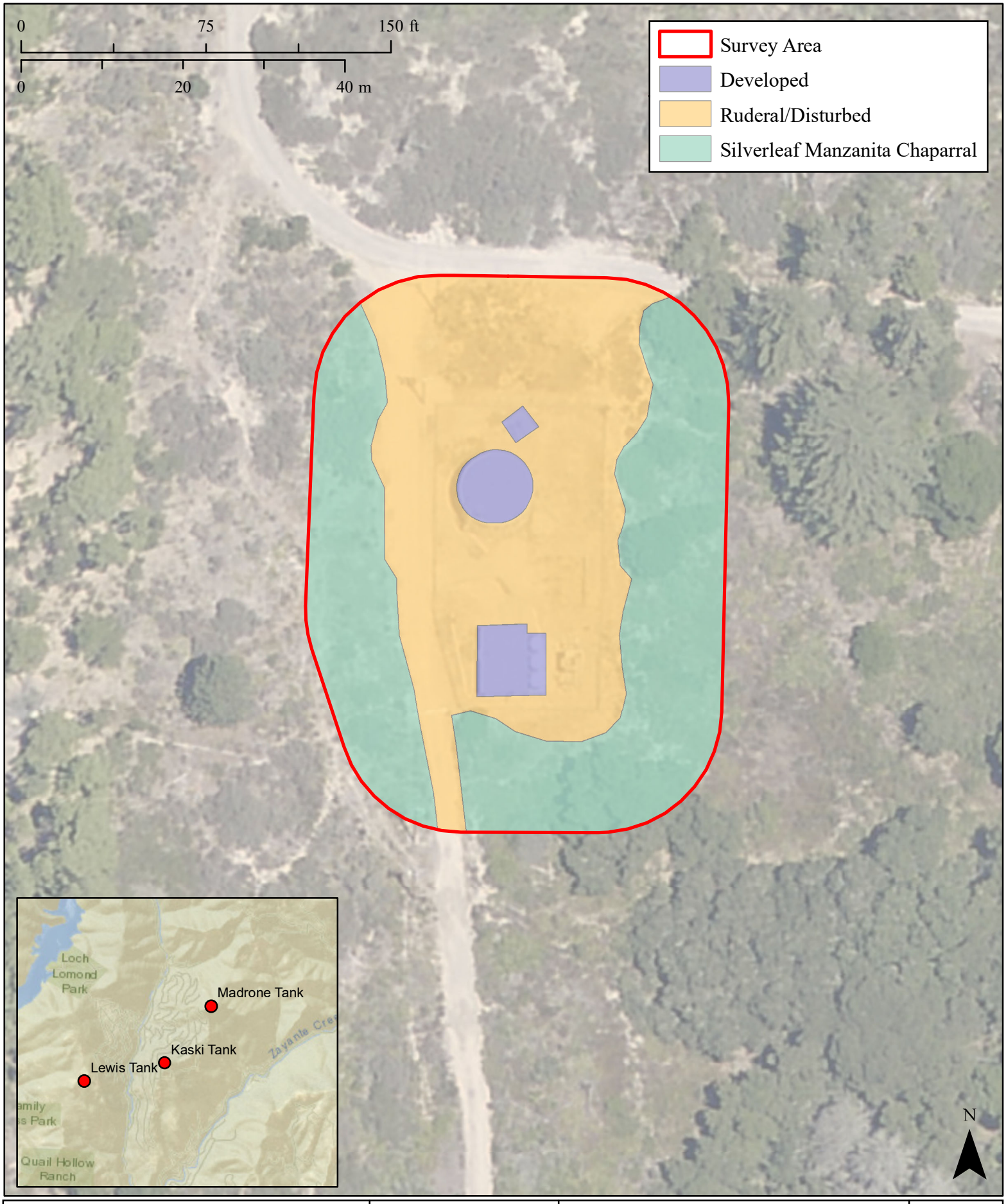
SLVWD Lompico Water Tanks Replacement Project Location Map	Date: 1/2/2019 Scale: 1 in = 700 ft Project: 2018.62	DD&A	Monterey | San Jose **Denise Duffy and Associates, Inc.** Environmental Consultants Resource Planners 947 Cass Street, Suite 5 Monterey, CA 93940 (831) 373-4341	Figure 1

Kaski Tank Land Cover Map

Date: 2/20/2019
Scale: 1 in = 50 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 2a

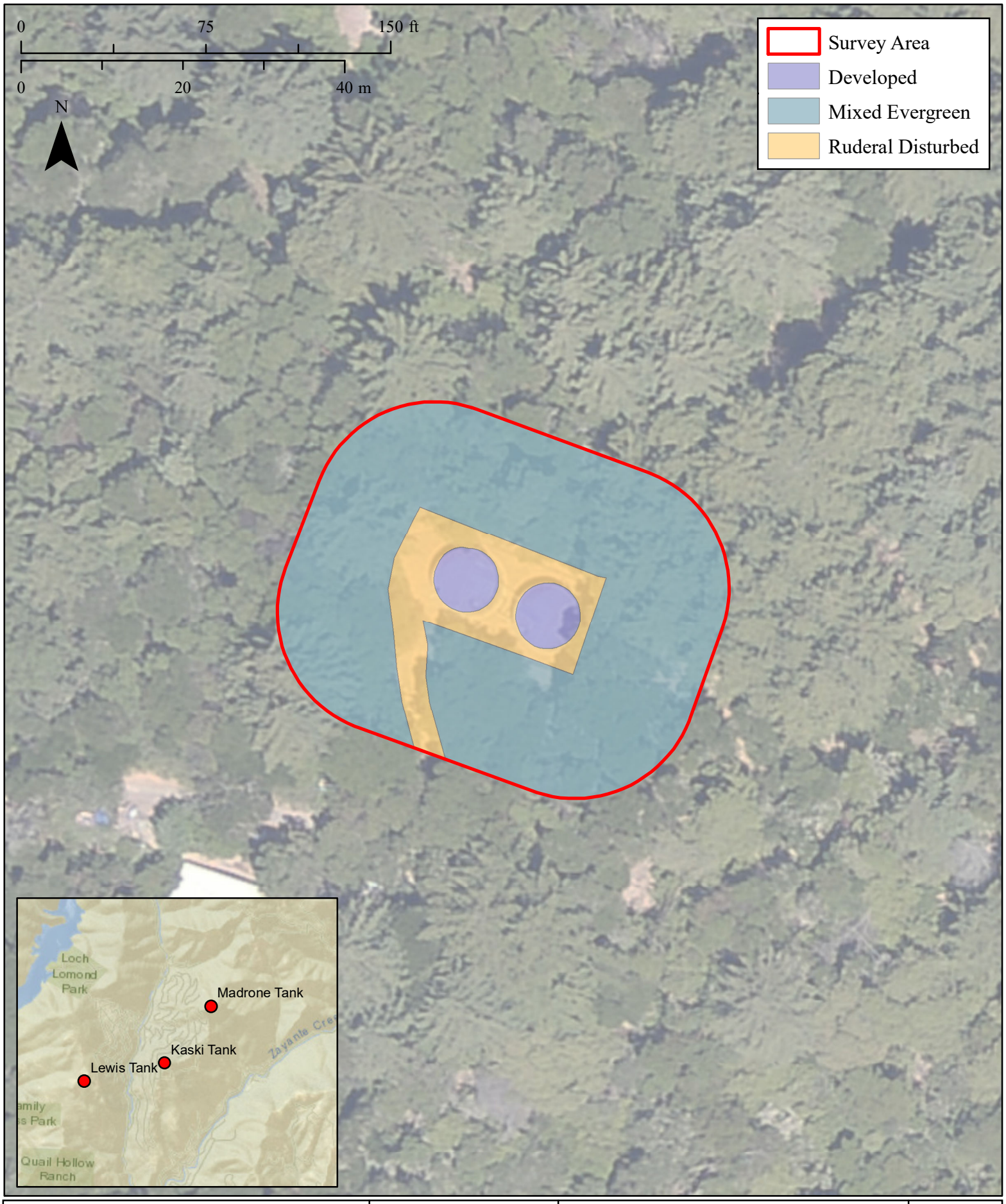


Lewis Tank Land Cover Map

Date: 2/20/2019
Scale: 1 in = 50 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure
2b



Madrone Tank Land Cover Map

Date: 2/20/2019
Scale: 1 in = 50 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure
2c

METHODS

Personnel and Survey Dates

DD&A biologists conducted surveys of all three tank sites on December 14, 2018 to perform initial evaluation, identify potential sensitive habitats, and identify any special-status plant or wildlife species present or potentially present within the survey areas. Survey areas are defined everything within the existing chain link fence at each tank location as well as a 50-foot buffer from the fence line (**Figure 2a-2c)**. The buffer area was included to capture any potential impacts that may occur during grading of the site. Survey methods included walking the survey areas using aerial maps, maps of previously mapped resources, and GPS to identify and map any biological resources. Current reference materials were reviewed prior to conducting the field surveys, including the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Data Base (CNDDB) occurrence reports (**Appendix C**) and Special Animals list (CDFW 2019a and 2019b), the Service's IPaC Resources List for the survey areas (**Appendix D**; Service 2019), and aerial photographs.

Following the initial survey effort DD&A biologists conducted focused botanical surveys of the Lewis tank site on May 2, and July 26, 2019 to determine presence of spring- and summer-blooming special-status plants. Populations of special-status plants with five or fewer individuals were mapped as points, and populations with greater than five individuals were mapped as polygons. Populations included all individuals within approximately three feet of another individual; individual plants further than three feet apart were mapped as a separate point or polygon.

Data collected during the surveys were used to assess the environmental conditions of the survey areas and their surroundings, evaluate environmental constraints at the survey areas and within the local vicinity, and provide a basis for recommendations to minimize and avoid impacts. Cartographic materials were prepared for the survey areas using ArcGIS software and Google Earth.

Data Sources

The primary literature and data sources reviewed in order to determine the occurrence or potential for occurrence of special-status species within and adjacent to the survey areas are as follows: current agency status information from the Service and CDFW for species listed, proposed for listing, or candidates for listing as Threatened or Endangered under the federal Endangered Species Act (ESA) or California Endangered Species Act (CESA) and those considered CDFW "species of special concern" (Service 2019 and CDFW 2019b); the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2019); and CNDDB occurrence reports from the United States Geological Survey (USGS) Felton quadrangle and the seven surrounding USGS quadrangles (Big Basin, Castle Rock Ridge, Los Gatos, Laurel, Soquel, Santa Cruz, and Davenport) (CDFW 2019a). From these resources, a list of special-status plant and wildlife species known or with the potential to occur in the vicinity of the proposed project was created (**Appendix C**). The list presents these species along with their legal status, habitat requirements, and a brief statement of the likelihood to occur.

Botany

Vegetation types identified in *A Manual of California Vegetation* (Sawyer et.al., 2009) were utilized to determine if vegetation types identified as sensitive on CDFW's Natural Communities List (CDFW, 2019c)

are present within the survey area. Scientific and common nomenclature for plant species identified within this document follows *The Jepson Manual: Vascular Plants of California, Edition 2* (Baldwin et al., 2012).

The survey areas were studied for botanical resources following the applicable guidelines outlined in: G*uidelines for Conducting and Reporting Botanical Inventories for Federally listed, Proposed and Candidate Plants* (Service 2000), P*rotocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (CDFW 2009), and C*alifornia Native Plant Society (CNPS) Botanical Survey Guidelines* (CNPS 2001). Habitats within the survey areas were characterized during field surveys. Data was recorded on physiognomy of the vegetation and on dominant and characteristic species, as well as basic ecological factors, including topography, slope, aspect, soil type, hydrologic regime, and evident disturbance. Habitat types were mapped using a combination of GIS and aerial photography, then digitized using ArcGIS software.

Wildlife

The following literature and data sources were reviewed: CDFW reports on special-status wildlife (Remsen 1978; Williams 1986; Jennings and Hayes 1994; Thelander 1994, Roest M. L. 1988); and California Wildlife Habitat Relationships Program species-habitat models (CDFW 2008; Zeiner et al. 1988; and Zeiner et al. 1990).

Special-Status Species

Special-status species are those plants and animals that have been formally listed or proposed for listing as Endangered or Threatened or are Candidates for such listing under ESA or CESA. Listed species are afforded legal protection under the ESA and CESA. Species that meet the definition of Rare or Endangered under the California Quality Act (CEQA) Section 15380 are also considered special-status species. Animals on the CDFW's list of "species of special concern" (most of which are species whose breeding populations in California may face extirpation if current population trends continue) meet this definition and are typically provided management consideration through the CEQA process, although they are not legally protected under the ESA or CESA.

Plants listed as rare under the California Native Plant Protection Act (CNPPA) or included in CNPS California Rare Plant Rank (CRPR; formerly known as "CNPS Lists") 1A, 1B, 2A, 2B, 3, and 4 are also treated as special-status species as they meet the definitions of Sections 2062 and 2067 of the CESA and in accordance with CEQA Guidelines Section 15380.[3] In general, CDFW requires that plant species on CRPR 1A (Plants presumed extirpated in California and Either Rare or Extinct Elsewhere), CRPR 1B (Plants rare, threatened, or endangered in California and elsewhere), CRPR 2A (Plants presumed extirpated in California, but more common elsewhere); CRPR 2B (Plants rare, threatened, or endangered in California, but more common elsewhere), CRPR 3 (Plants about which we need more information - a review list), and CRPR 4 (Plants of limited distribution - a watch list) of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2019) be fully considered during the preparation of environmental

[3] CNPS initially created five CRPR in an effort to categorize degrees of concern; however, in order to better define and categorize rarity in California's flora, the CNPS Rare Plant Program and Rare Plant Program Committee have developed the new CRPR 2A, and CRPR 2B.

documents relating to CEQA.[4] In addition, species of vascular plants, bryophytes, and lichens listed as having special-status by CDFW are considered special-status plant species (CDFW 2019a).

Raptors (e.g., eagles, hawks, and owls) and their nests are protected in California under Fish and Game Code Section 3503.5. Section 3503.5 states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except otherwise provided by this code or any regulation adopted pursuant thereto."

In addition, fully protected species under the Fish and Game Code Section 3511 (birds), Section 4700 (mammals), Section 5515 (fish), and Section 5050 (reptiles and amphibians) are also considered special-status animal species. Species with no formal special-status designation but thought by experts to be rare or in serious decline may also be considered special-status animal species in some cases, depending on project-specific analysis and relevant, localized conservation needs or precedence.

Sensitive Habitats

Sensitive habitats include riparian corridors, wetlands, habitats for legally protected species, areas of high biological diversity, areas supporting rare or special-status wildlife habitat, and unusual or regionally restricted habitat types. Vegetation types considered sensitive include those identified as sensitive on the CDFW's Natural Communities List (i.e., those habitats that are rare or endangered within the borders of California) (CDFW 2019c), and those that are occupied by species listed under ESA or are critical habitat in accordance with ESA. Specific habitats may also be identified as sensitive in city or county general plans or ordinances. Sensitive habitats are regulated under federal regulations (such as the CWA and Executive Order 11990 – Protection of Wetlands), state regulations (such as CEQA and the CDFW Lake and Streambed Alteration Program), or local ordinances or policies (such as city or county tree ordinances and general plan policies).

Regulatory Setting

Federal Regulations

Federal Endangered Species Act

Provisions of the ESA of 1973 (16 USC 1532 et seq., as amended) protect federally Listed Threatened or Endangered species and their habitats from unlawful take. Listed species include those for which proposed and final rules have been published in the Federal Register. The ESA is administered by the Service or NMFS. In general, NMFS is responsible for the protection of ESA-Listed marine species and anadromous fish, whereas other listed species are under Service jurisdiction.

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered or threatened. Take, as defined by ESA, is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the fish or wildlife…including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." In addition, Section 9 prohibits removing, digging up, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites not under federal jurisdiction. If there is the potential for

[4] Species on CRPR 3 and CRPR 4 may, but generally do not, meet the definitions of Sections 2062 and 2067 of CESA, and are not typically considered in environmental documents relating to CEQA.

incidental take of a federally listed fish or wildlife species, take of listed species can be authorized through either the Section 7 consultation process for federal actions or a Section 10 incidental take permit process for non-federal actions. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits).

State Regulations

California Endangered Species Act

CESA was enacted in 1984. The California Code of Regulations (Title 14, §670.5) lists animal species considered Endangered or Threatened by the State. Section 2090 of CESA requires State agencies to comply with endangered species protection and recovery and to promote conservation of these species. Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an Endangered species or a Threatened species. “Take” is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." A Section 2081 Incidental Take Permit from the CDFW may be obtained to authorize “take” of any State Listed species.

California Fish and Game Code

Birds: Section 3503 of the Fish and Game Code states that it is “unlawful to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Section 3503.5 prohibits the killing, possession, or destruction of any birds in the orders Falconiformes or Strigiformes (birds-of-prey). Section 3511 prohibits take or possession of fully protected birds. Section 3800 prohibits take of nongame birds.

Fully Protected Species: The classification of fully protected was the state's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish (§5515), mammals (§4700), amphibians and reptiles (§5050), and birds (§3511). Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

Species of Special Concern: As noted above, the CDFW also maintains a list of animals “species of special concern.” Although these species have no legal status, the CDFW recommends considering these species during analysis of project impacts to protect declining populations and avoid the need to list them as Endangered in the future.

California Native Plant Protection Act

The CNPPA of 1977 directed the CDFW to carry out the legislature’s intent to “preserve, protect and enhance rare and Endangered plants in the State.” The CNPPA prohibits importing rare and Endangered plants into California, taking rare and Endangered plants, and selling rare and Endangered plants. The CESA and CNPPA authorized the Fish and Game Commission to designate endangered, threatened, and

rare species and to regulate the taking of these species (§2050-2098, Fish and Game Code). Plants listed as rare under the CNPPA are not protected under CESA.

RESULTS

Vegetation Types

A brief description of each of the vegetation types can be found below along with the identification of the presence or potential presence of special-status species within each. A generalized nomenclature for vegetation type is used within this document for ease of reference; however, each vegetation type description also lists the Manual of California Vegetation *(*Sawyer et.al. 2009*)* vegetation type(s) in order to provide a crosswalk to the Natural Communities List.

Kaski Tank

Two vegetation types were identified and delineated within the Kaski tank survey area: mixed evergreen and ruderal/disturbed (**Figure 2a**). A portion of the survey area is also developed (i.e. the Kaski tanks, infrastructure, and pavement). The following is the approximate area of each vegetation type within the Kaski tank survey area:

- Mixed Evergreen 18,130.4 square feet (ft^2) (~0.4 acre)
- Ruderal/Disturbed 5,413.4 ft^2 (~0.1 acre)
- Developed 990.9 ft^2 (~0.01 acre)

Figure 2a includes a detailed map of vegetation types within the Kaski tank survey area.

Mixed Evergreen

- *A Manual of California Vegetation classification:* Redwood *Sequoia sempervirens and* Douglas Fir *Pseudotsuga menziesii var. menziesii Forest Alliance*
- *CDFW Natural Communities List*: Sensitive

Mixed evergreen forest occurs outside of the chain link fence on all sides of the Kaski tank survey area. The canopy is dominated by Douglas fir and redwood. Several other tree species, including tan oak (*Notholithocarpus densiflorus*), madrone, toyon, big leaf maple (*Acer macrophyllum*), California bay, elderberry (*Sambucus mexicanus*) and coast live oak, are also present. The understory is mostly bare ground or covered with detritus, consisting mainly of redwood needles. Sparse vegetation found within the understory includes sword fern, wood fern, California rose, snowberry, poison oak, and blackberry.

Special-status wildlife species known or with the potential to occur within this vegetation type include SFDW and Cooper's hawk. Mixed evergreen forest may also provide nesting habitat for other raptors and protected bird species.

Ruderal/Disturbed

- *A Manual of California Vegetation classification:* redstem filaree, rattail fescue, smooth cat's ears, and ripgut brome Semi-Natural Herbaceous Stands
- *CDFW List of Alliances and Associations*: Not sensitive

Ruderal areas are those areas which have been developed and disturbed by human activities and are devoid of vegetation or dominated by non-native species. Within the Kaski tank survey area, this vegetation type

includes disturbed areas between the access road and mixed evergreen vegetation type (**Figure 2a**). These areas are either mostly devoid of vegetation or are dominated by non-native, "weedy" species such as poison hemlock (*Conium maculatum*), black mustard (*Brassica nigra*), slender oat (*Avena barbata*), French broom (*Genista monspessulana*, cheeseweed (*Malva parviflora*), and bristly ox-tongue (*Helminthotheca echioides*). Some native species such as coffeeberry (*Frangula californica*), and poison oak (*Toxicodendron diversilobum*) are also present.

Common wildlife species which do well in urbanized and disturbed areas that may occur within the ruderal habitat include American crow (*Corvus brachyrhynchos*), raccoon, striped skunk (*Mephitis mephitis*), scrub jay (*Aphelocoma californica*), European starling (*Sturnus vulgaris*), western fence lizard (*Sceloporus occidentalis*), and rock dove (*Columba livia*).

Special-status wildlife species that may be found in the ruderal areas includes Cooper's hawk. Additionally, northern harrier, white-tailed kite, and other raptor and migratory bird species may forage and nest within the ruderal areas. No special-status plant species were identified within the ruderal areas during surveys.

Developed

- *A Manual of California Vegetation classification:* None
- *CDFW List of Alliances and Associations*: None

Developed areas within the Kaski tank survey area include the Kaski tanks, associated infrastructure, and any areas covered with asphalt. These areas are completely devoid of vegetation and provide no habitat for plants and wildlife. No special-status wildlife or plant species were observed within the developed areas and none are expected to occur due to lack of suitable habitat.

Lewis Tank

Two vegetation types were identified and delineated within the Lewis tank survey area: silverleaf manzanita chaparral and ruderal/disturbed (**Figure 2b**). A portion of the survey area is also developed (i.e. the Lewis tanks, infrastructure, and pavement). The following is the approximate area of each vegetation type within the Lewis tank survey area:

- Silverleaf Manzanita Chaparral 16,578.2 square feet (ft^2) (~0.4 acre)
- Ruderal/Disturbed 16,910.7 ft^2 (~0.4 acre)
- Developed 1,597.7 ft^2 (~0.04 acre)

Figure 2b includes a detailed map of vegetation types within the Lewis tank survey area.

Silverleaf Manzanita Chaparral

- *A Manual of California Vegetation classification:* Silverleaf Manzanita *Arctostaphylos silvicola* Provisional Shrubland Alliance
- *CDFW Natural Communities List*: Sensitive

Silverleaf manzanita chaparral forms stands on sandstone substrates and old marine sand deposits known as the Sandhills in the Santa Cruz Mountains. communities are composed of relatively small to medium sized plants, ranging in height from a several inches to over twelve (12) feet. Silverleaf manzanita chaparral

ranges from 100-600 meters in elevation. Within the study area, this community is dominated by a silverleaf manzanita, black sage (*Salvia mellifera*), silver bush lupine, and yerba santa. A complete list of plants observed during the site visit is provided in **Appendix B.** This vegetation type is found surrounding the Lewis tank site **Figure 2b.**

Silverleaf manzanita chaparral provide habitat to a number of wildlife species, including California vole (*Microtus californicus*), wren-tit (*Chamaea fasciata*), California thrasher (*Toxostoma redivivum*), western fence lizard, gopher snake (*Pituophis catenifer*), and coyote (*Canis latrans*)

Special-status plant species observed within this vegetation type include silverleaf manzanita, Ben Lomond spineflower, and Ben Lomond buckwheat. No other special-status plant species were observed within this vegetation type during focused botanical surveys. Special-status wildlife species that may occur within this vegetation type include MHJB, SFDW, Santa Cruz kangaroo rat, and Cooper's hawk.

Ruderal/Disturbed

Ruderal areas are those areas which have been developed and disturbed by human activities and are devoid of vegetation or dominated by non-native species. Within the Lewis tank survey area this vegetation type is present within the chain link fence, the access road/staging area, and on the northern end of the survey area (**Figure 2b**). These areas are either mostly devoid of vegetation or are dominated by non-native, "weedy" species such as redstem filaree (*Erodium cicutarium*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), western goldentop (*Euthamia occidentalis*), tall whitetop (*Lepidium latifolium*), and smooth cat's ear (*Hypochaeris glabra*). Some native species such as tall cyperus (*Cyperus eragrostis*), yerba santa, and Sneezeweed (*Helenium puberulum*) are also present.

Common wildlife species observed within the ruderal habitat include Nuttall's woodpecker (*Picoides nuttallii*), striped skunk (*Mephitis mephitis*), scrub jay (*Aphelocoma californica*), western fence lizard (*Sceloporus occidentalis*), and rock dove (*Columba livia*).

Ben Lomond spineflower was the only special-status plant species observed within this vegetation type. Special-status wildlife species that may be found in the ruderal areas includes Santa Cruz kangaroo rat, Cooper's hawk, and MHJB.

Madrone Tank

Two vegetation types were identified and delineated within the Madrone tank survey area: mixed evergreen and ruderal/disturbed (**Figure 2c**). A portion of the survey area is also developed (i.e. the Madrone tanks, infrastructure, and pavement). The following is the approximate area of each vegetation type within the Madrone tank survey area

- Mixed Evergreen 17,787.5 square feet (ft^2) (~0.4 acre)
- Ruderal/Disturbed 3.033.3 ft^2 (~0.07 acre)
- Developed 1,092.8 ft^2 (~0.03 acre)

A brief description of each of these vegetation types can be found below along with the identification of the presence or potential presence of special-status species within each type. A generalized nomenclature for vegetation types is used within this document for ease of reference; however, each vegetation type

description also lists the *Manual of California Vegetation* (Sawyer et.al., 2009) vegetation type(s) in order to provide a crosswalk to the Natural Communities List. **Figure 2c** includes a detailed map of vegetation types within the Madrone tank survey area.

Mixed Evergreen

For a complete description of this vegetation type, refer to the Kaski tank section above. Mixed evergreen forest occurs outside of the chain link perimeter fence on all sides of the project and bordering the access road/staging area of the Madrone tank survey area (**Figure 2c**).

No special-status plant species were observed within this vegetation type. Special-status wildlife species observed within this habitat type include SFDW and Cooper's hawk. Mixed evergreen forest may also provide nesting habitat for other raptors and protected bird species.

Ruderal/Disturbed

For a complete description of this vegetation type, refer to the Kaski tank section above. Within the Madrone tank survey area, this vegetation type is present within the chain link fence, and within the access road/staging area of the survey area (**Figure 2c**).

Sensitive Habitats

CDFW Sensitive Natural Communities

Silverleaf manzanita chaparral is listed as a sensitive habitat on the CDFW Natural Communities List. This vegetation type occurs within the Lewis tank survey area and provides suitable habitat for several special-status plant and wildlife species (**Figure 2b**). Mixed evergreen forest is also listed as a sensitive habitat on the CDFW Natural Communities List. This vegetation type occurs at Madrone and Kaski tank survey areas. Descriptions for these vegetation types are presented above.

Suitable Habitat for Mount Hermon June Beetle

DD&A's field investigation, conducted on December 14, 2018, identified suitable habitat for MHJB at the Lewis Tank project site. As identified above, two vegetation types were observed within the Lewis tank survey area: silverleaf manzanita chaparral and ruderal/disturbed (**Figure 2b**). Descriptions of these habitats are presented above. Zayante soils, present within both habitat types, represents suitable habitat for MHJB. While still considered suitable, the areas within and immediately surrounding the fence line are relatively degraded due to the dominance of non-native invasive plant species and disturbance attributed to the operations of the tank site.

Special-Status Species

Published occurrence data within the survey areas and surrounding USGS quadrangles were evaluated to compile a table of special-status species known to occur in the vicinity of the project (**Appendix C**).[5] Each of these species was evaluated for their likelihood to occur within and immediately adjacent to the survey areas. The special-status wildlife species that are known to or have been determined to have a moderate to

[5] The USGS quadrangles in which published CNDDB data was searched included Calaveras, Cupertino, La Costa Valley, Milpitas, Mountain View, Newark, Niles, San Jose East, and San Jose West.

high potential to occur within or immediately adjacent to the survey areas are discussed below. All other wildlife species within the table are assumed "not present," "unlikely to occur," or have a low potential to occur within the survey areas for the species-specific reasons presented in **Appendix C**.

Special-Status Wildlife Species

Santa Cruz Kangaroo Rat

The Santa Cruz kangaroo rat is included on the CDFW's CNDDB "Special Animals" list. The CDFW's CNDDB "Special-Animals" list is a list referred by the CDFW as a list of species at risk, this species is mentioned in this report because the all tank sites are located within Santa Cruz County, the known core population for this species. Santa Cruz kangaroo rat occur in the cool, maritime mountains of west-central California. Historical records range from Mount Hamilton to Corralitos, with most specimens collected around Mount Hermon, Felton, and Bonny Doon, in Santa Cruz County. The species occurs in Mount Hermon, but in remnant patches of suitable habitat surrounded by development. Burrow surveys at Bonny Doon suggest the species still occurs there, although limited live-trapping efforts yielded no captures. This species is active year-round with a diet dominated by seeds. Burrows are simple often located in open, abandoned agricultural land. Santa Cruz kangaroo rat occurs in chaparral habitat in the low foothills of the Santa Cruz Mountains, on substrates of sands, loams, and sandy loams; often described as sandy ponderosa pine parkland, with a chaparral understory. The species distribution conforms closely to the distribution of open chaparral habitat occurring on sandy soils (Zayante or Santa Margarita soils) (Hawbecker 1940, Rudd 1948). The largest undisturbed area of occupied habitat in Santa Cruz County is the S. H. Cowell Foundation property adjacent to Henry Cowell State park; the Department Reserve in Bonny Doon, Wilder Ranch, and Henry Cowell state parks also contains important patches of habitat, that may or may not be occupied by this species.

The CNDDB reports nine (9) occurrences of Santa Cruz kangaroo rat within the quadrangles evaluated, the closest of which is a nonspecific occurrence (2,000-acre general area) located within the Kaski and Lewis tanks survey areas. However; suitable habitat for this species is present only within the sandy loam soils and chaparral at the Lewis tank survey area.

San Francisco Dusky-Footed Woodrat

The SFDW is listed on the CDFW's list of species of special concern. This species is found in heavy chaparral, hardwood, conifer, and mixed forests, typically in densely wooded areas with heavy undergrowth riparian woodlands. This species builds its nest with debris on the ground or in a tree; nests tend to be in situations that are shaded, relatively cool, and in good cover, and they may be used by many generations over several years (Carraway, 1991). Nests for this species were observed in the vegetated portions of the survey area at all three tank sites.

Raptors and Other Migratory Bird Species

Raptors and their nests are protected under Fish and Game Code. While the life histories of these species vary, overlapping nesting and foraging similarities (approximately February through August) allow for their concurrent discussion. Most raptors are breeding residents throughout most of the wooded portions of the state. Open wetland and ruderal habitat can often be used for hunting. Breeding occurs February through August, with peak activity May through July. Prey for these species includes small birds, small mammals,

and some reptiles and amphibians. Many raptor species hunt in open wetlands and habitat edges. Various common raptor species (such as red-tailed hawk (*Buteo jamaicensis)*, red-shouldered hawk (*Buteo lineatus)*, American kestrel (*Falco sparverius)*, and turkey vulture (*Cathartes aura*) and special-status raptor species (such as white-tailed kite and northern harrier) have the potential to forage and nest within the survey areas of the Kaski and Madrone tanks and adjacent to the survey area of Lewis tank.

Mount Hermon June Beetle

MHJB is a federally Endangered species under ESA. This species is restricted to the Zayante sandhills habitat of the Ben Lomond-Mount Harmon-Scotts Valley area. MHJB feeds as a fossorial larva on plant roots and associated mycorrhizae, and then emerges as an adult in late spring and early summer to mate. MHJB occurs in areas with Zayante soils that feature a variety of vegetation. While not always present, silver-leaf manzanita is often an indicator of suitable habitat. Other vegetation types that may provide suitable habitat include but are not limited to sand parkland, ponderosa pine forest, as well as areas that have been landscaped and feature ornamental vegetation.

Approximately 0.76-acre (33,465.08 square feet [ft^2]) of suitable MHJB habitat exists within the Lewis tank survey area (**Figure 3**). Approximately 0.17-acre (7,262.98 ft^2) of this habitat will be permanently impacted[6] by the tank replacement and approximately 0.16-acre (7,061.70 ft^2) of this habitat will be temporarily[7] impacted by the temporary tanks/staging/other construction activities.

Special-Status Plant Species

The CDFW requires that focused rare plant surveys be conducted approximately every two to three years to determine presence or absence. Although there is only a low potential for other special-status plant species to occur within the survey areas, the discussion below includes plant species whose preferred habitat types occur within the survey areas. All other species within the table are assumed "not present" or "unlikely to occur" within the survey areas for the species-specific reasons presented in **Appendix C**.

Silverleaf Manzanita

Silverleaf manzanita is endemic to the Santa Cruz sandhills is a CNPS CRPR 1B species. This evergreen shrub, in the Ericaceae family, is associated with chaparral, closed-cone coniferous forests, and lower montane coniferous forests on inland marine Zayante soils at a range of 120-600 meters in elevation. The typical blooming period is from February through March. Silverleaf manzanita was observed adjacent to and within silverleaf manzanita chaparral at the Lewis tank survey area (in the adjacent parcels to the north and west) during botanical surveys.

Ben Lomond Spineflower

Ben Lomond spineflower is a federally endangered, CNPS CRPR 1B species. This annual herb, in the Polygonaceae family, typically blooms from April through July. Ben Lomond spineflower is associated with lower montane coniferous forest (maritime ponderosa pine sandhills) at elevations of 90-610 meters.

[6] Due to soil disturbance and compactions all areas within the existing fence line will be permanently impacted.
[7] Areas outside of the existing fence line will be restored, therefore impacts are considered temporary.

Ben Lomond spineflower was observed within the Lewis tank survey area during focused botanical surveys. DD&A recorded nine polygons totaling approximately 645 ft^2 and 5 points totaling 7 individuals within the Lewis tank survey area (**Figure 4**).

Ben Lomond Buckwheat

Ben Lomond buckwheat is a CNPS CRPR 1B species. This perennial herb, in the Polygonaceae family, is associated with chaparral, cismontane woodland, and lower montane coniferous forest (maritime ponderosa pine sandhills) on sandy soils, at elevations of 50-800 meters. The typical blooming period is from July through October.

Ben Lomond buckwheat was observed within the Lewis tank survey area during focused botanical surveys. DD&A recorded one polygon (97 ft^2) of this species within the silverleaf manzanita chaparral vegetation cover (**Figure 4**).

Endangered Species Act

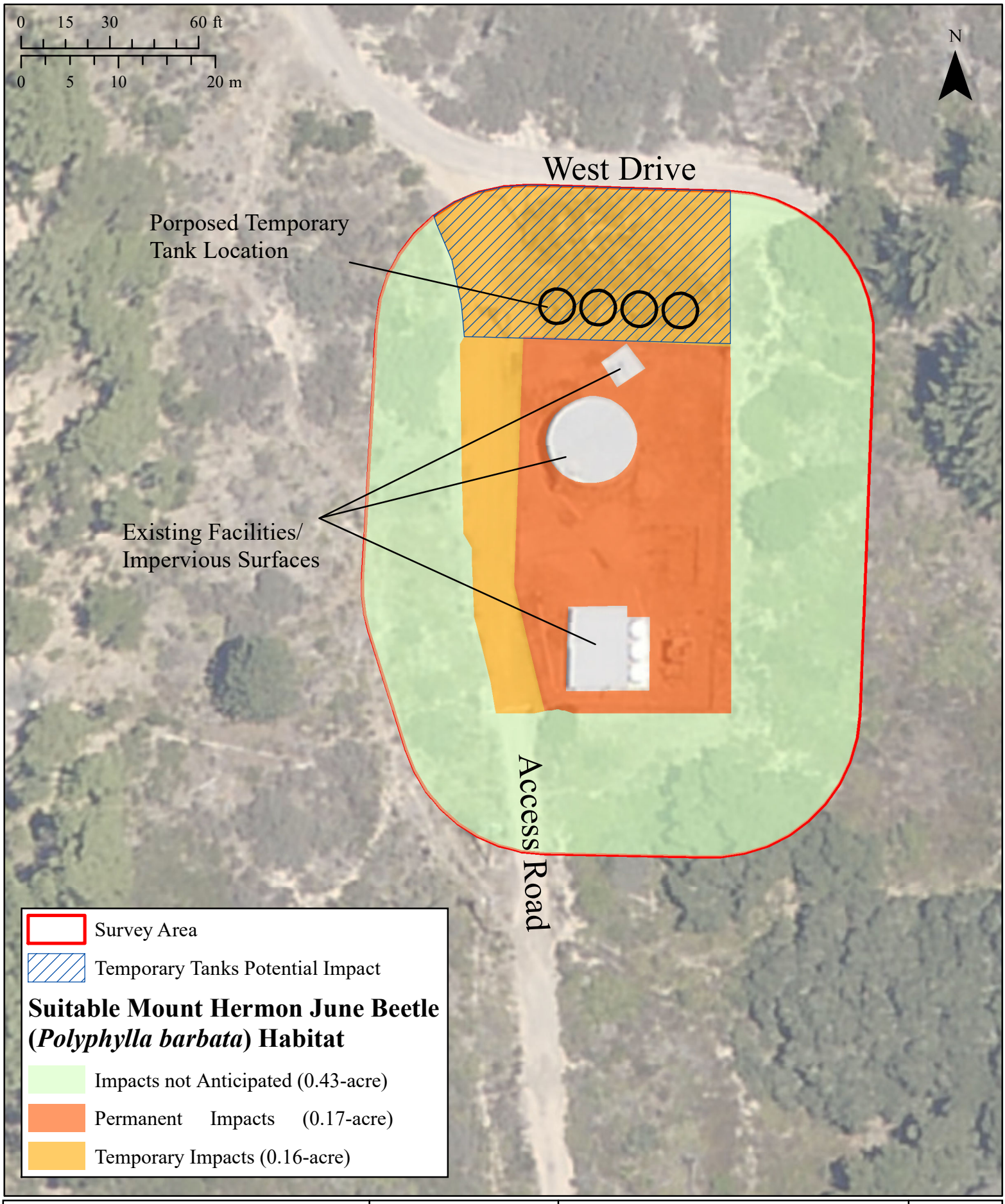
The Lewis tank began leaking excessively in June 2019, and the District employed divers to repair the tank; however, they were not able to repair all the leaks and the District has determined that the tank will soon fail. To ensure water storage and availability for the residents that rely on the Lompico Tanks infrastructure, including the Lewis tank, the District proposed to install temporary storage tanks as soon as possible. Due to the current state of the Lewis tank, the District proposed to install the temporary tanks prior to completion of the CEQA review process and other related regulatory permit requirements. The temporary tanks and associated infrastructure, shown in the attached site plans, will be placed north of the existing Lewis tank site fence line. The District considered the following alternatives for temporary tank placement:

1. Inside the Lewis tank site existing fence line,
2. Outside the Lewis tank site existing fence line between West Ave and the north fence, and
3. A nearby District lot (APN 075-321-02), which was the old Lewis tank #1 site.

The proposed temporary tank location (Option 2) was determined to be the least impactful and most efficient option. The off-site location (Option 3) would require grading and pipe installation that would impact a larger footprint of suitable habitat for MHJB, a federally Endangered species. There is an existing Pressure Release Valve (PRV) vault adjacent to the onsite location so ground disturbance for temporary piping would be reduced when compared to the off-site option. Additionally, the proposed off-site location has not been utilized by the District in approximately 20 years and vegetation removal would be extensive. Option 1, placing the temporary tanks within the existing fence line, was dismissed because the replacement of the existing Lewis tank will involve removing and regrading everything inside the existing fence line, so temporary tanks installed inside the existing fence would eventually be relocated outside the fence. Additionally, the site north of the fence is approximately 5-feet higher in elevation than the area inside the fence; the elevation reduces the change in system water pressure.

The installation of the temporary tanks and the completion of the tank replacement project will result in temporary and permanent impacts to MHJB suitable habitat and Ben Lomond spineflower populations. DD&A and the District discussed the potential impacts to listed species during a conference call with the Service on June 3, 2019. The Service requested that DD&A identify avoidance and minimization measures

to reduce the potential for the project to impact MHJB individuals and habitat. Measures are included below to avoid or minimize these potential impacts to the greatest extent possible. At the request of the Service, measures were adapted from the *Low-Effect Habitat Conservation Plan for the San Lorenzo Valley Water District's Probation Tank Replacement Project* (McGraw Consulting 2017) and the *Final Mitigated Negative Declaration and Response to Comments Received Probation Tank Replacement Project* (District, 2017). The District sent an official request to the Service requesting take coverage under ESA on July 9, 2019 (Appendix E). The Service responded via email (Appendix F) to the District's request confirming ESA compliance on July 15, 2019.

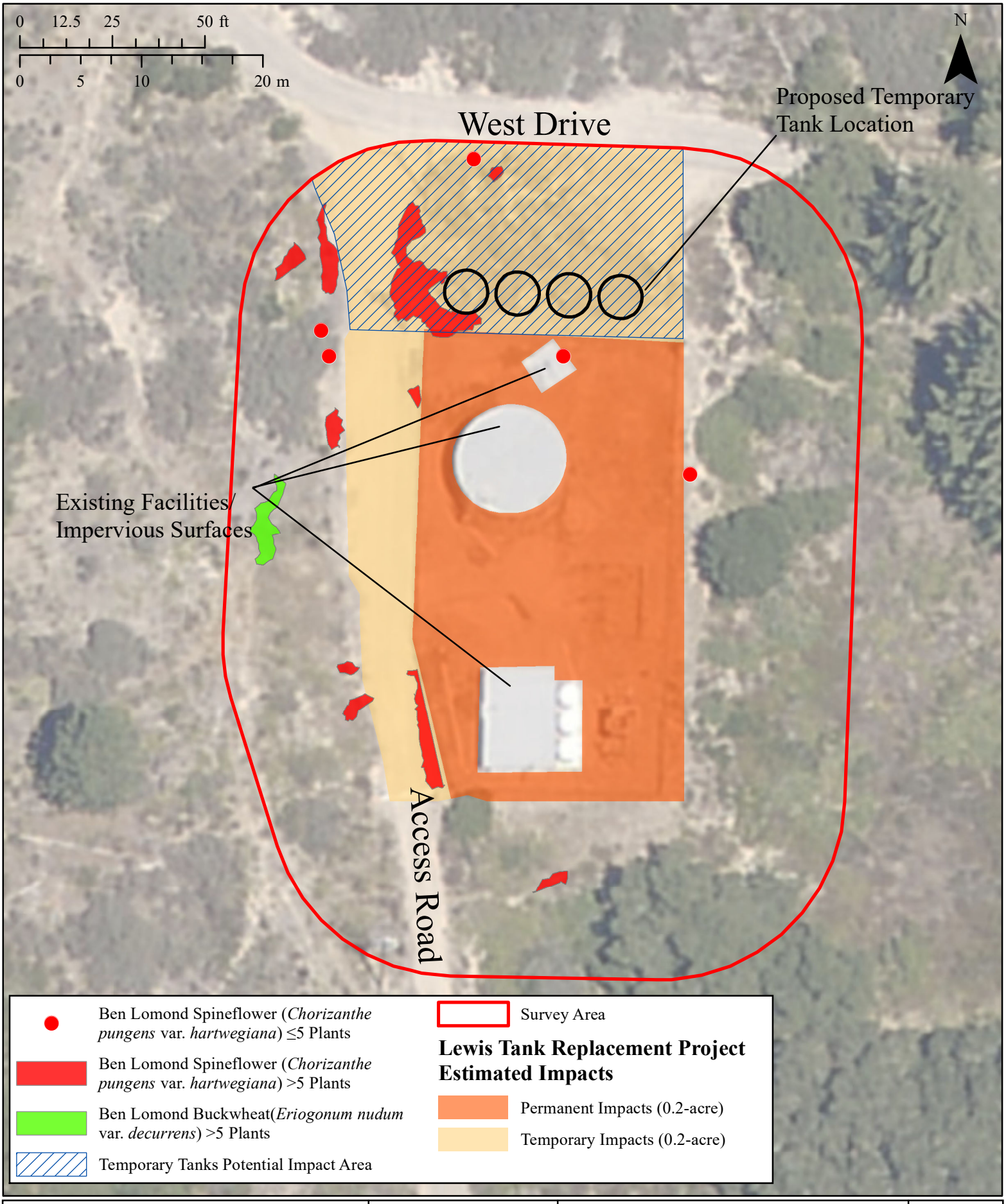


Potential Impacts to Suitable Mount Hermon June Beetle Habitat

Date: 7/9/2019
Scale: 1 in = 40 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 3



Rare Plant Map
Lewis Tank Site

Date: 9/3/2019
Scale: 1 in = 30 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 4

Document Path: F:\GIS\GIS_Projects\2018-62 Lompico Tanks\Map Products\Figure 4. Rare Plant Map Lewis Tank Impact.mxd

This page left intentionally blank

IMPACTS AND MITIGATION

This report describes the biological resources within the identified survey areas that could potentially be impacted by the project. Sensitive habitats, and special-status species, as well as the potential for several special-status species, were identified within the survey area. Implementation of the project could result in potentially significant impacts to these resources. The following provides an overview of mitigation measures that are recommended to reduce impacts to special-status species and sensitive habitats to a less than significant level under CEQA.

All Tank Sites

To reduce impacts to all special-status species and sensitive habitats the District will implement the following Mitigation Measures:

MM 1. The District shall ensure that a qualified biologist conducts an education program for all persons employed on the project prior to performing construction activities. Instruction shall consist of a presentation by the qualified biologist that includes a discussion of the biology and general behavior of any special-status species which may be in the area, how they may be encountered within the work area, and procedures to follow when they are encountered. The status of CESA-listed species including legal protection, penalties for violations and project-specific protective management measures shall be discussed. The District shall prepare and distribute wallet-sized cards or a factsheet handout containing this information for workers to carry on-site. Upon completion of the program, employees shall sign an affidavit stating they attended the program and understand all protection measures.

To reduce impacts to Santa Cruz kangaroo rats the District will implement the following Mitigation Measure:

MM 2. To prevent the inadvertent entrapment of Santa Cruz kangaroo rats during construction, all excavated, steep-walled holes or trenches more than 2 feet deep shall be covered with plywood or similar materials at the close of each working day, or escape ramps constructed of earth fill or wooden planks shall be positioned within the excavations to allow special-status wildlife to escape on their own. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. Inspections shall be conducted by qualified biologist or construction personnel that have been specifically identified and trained by the qualified biologist. If trapped animals are observed, escape ramps or structures shall be installed immediately to allow escape. Trapped wildlife shall only be handled by a qualified biologist, if necessary.

To reduce impacts to SFDW the District will implement the following Mitigation Measures:

MM 2. A qualified biologist will conduct preconstruction surveys of all ground disturbance areas to determine if SFDW are present prior to the start of construction. The biologist will conduct these surveys no more than 2 weeks prior to the beginning of construction. If SFDW nests are found, nests shall be mapped/flagged and documented in pre-construction report.

MM 3. In the event that a SFDW nest is found, and assuming the nest is of the SFDW sub-species, one of the following measures will be implemented. These measures are listed in order of priority, where the first measure is the preferred measure to be implemented as it provides the least amount of impact to the woodrat. If the first measure cannot be implemented due to extenuating site conditions, the second shall be implemented and so forth down the list.

1. The development will be rerouted/re-sited if possible, to avoid the woodrat nest by at least 50 feet.
2. Safety and/or silt fencing will be erected around all nests within 25 feet of the grading and construction activities to avoid impacts during site work.
3. 3.In the event that the project footprint must go directly through a nest, the District shall trap SFDW, dismantle, and relocate nests using the following methodology:

    - Prior to nest disturbance, the biologist shall obtain from CDFG a scientific collection permit for the trapping of the SFDW.
    - Nests shall be disturbed/dismantled during the non-breeding season, between October 1 and December 31, if possible.
    - At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the SFDW nest location and locate any other nests that may have been built in the project vicinity that may be affected by the proposed development.
    - Prior to nest disturbance, SFDW shall be trapped at dusk of the night set for relocation of the nest(s).
    - Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).
    - In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the woodrats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used.
    - Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing SFDW trails or toward other available habitat.
    - If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling.
    - Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the SFDW and far enough away from the construction activities that they will not be impacted.
    - SFDW that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for SFDW to find refuge.

MM 4. A biological monitor should be on site for all vegetation removal and initial ground disturbing activities. Following ground disturbance, the biological monitor shall train a construction crewmember to act as the biological monitor for the remainder of the construction.

To reduce impacts to nesting raptors and other avian species the District will implement the following Mitigation Measures:

MM 5. If equipment staging, site preparation, grading, excavation or other Project-related construction work is scheduled during the nesting season of protected raptors and other avian species, a qualified biologist shall conduct two surveys for active nests within 14 days prior to the beginning of Project construction. The final survey shall be conducted within 48 hours prior to construction. Surveys shall be conducted in all suitable habitat located at Project work sites, in staging, storage and soil stockpile areas. Nesting seasons are typically defined as March 15 to August 30 for small bird species such as passerines and February 15 to September 15 for other raptors. The minimum survey radii surrounding the work area shall be 300 feet. If an active nest is found during surveys, the qualified biologist shall designate a protected area (while occupied) during Project construction by demarking a "No Work Zone" around each nest site. The qualified biologist shall monitor the behavior of the birds (adults and young, when present) at the nest site to ensure that they are not disturbed by Project construction work. Nest monitoring shall continue during construction until the young have fully fledged (have completely left the nest site and are no longer being fed by the parents), as determined by the qualified biologist.

Lewis Tank

To reduce impacts to silverleaf manzanita and Ben Lomond buckwheat the District will implement the following Mitigation Measures:

MM 7. The District will install exclusionary fencing (orange cyclone fencing) at the limits of construction for the Lewis Tank Site. A qualified biologist will be onsite to direct the fence installation and ensure that silverleaf manzanita and Ben Lomond buckwheat are avoided. The fencing will be inspected once a week to ensure that it remains intact during project construction.

To avoid and minimize impacts to Ben Lomond spineflower the District will implement the following avoidance and minimization measures (A&MMs):

A&MM 1. Prior to construction, implement a construction fencing plan that demarcates construction access routes and staging areas such that inadvertent impacts to special-status plant species are avoided including silverleaf manzanita and Ben Lomond buckwheat. Install construction fencing prior to work and maintain fencing throughout the construction period.

A&MM 2. During the summer prior to construction, if possible, a qualified biologist will collect seed of all the Ben Lomond spineflower plants from within the project impact area, for use in restoration (see RM 3).

A&MM 3. For all mapped Ben Lomond spineflower populations that cannot be avoided during installation of the temporary storage tanks or implementation of the larger tank replacement

project and have already desiccated beyond the ability to collect seed, topsoil shall be salvaged for use in restoration efforts, post-project.

a) Topsoil (top 6-8 inches) will be carefully removed by an experienced operator using a dragline, excavator, scraper, or dozer and will be stockpiled in uncompacted piles less than 4 feet tall. Stockpiled soils will be placed on top of an impervious surface, such as a tarp, within temporary disturbance areas. Topsoil stockpiles will be stabilized by spraying with a tackifier (soil stabilizer) or covered with a permeable natural material, such as jute or coconut fiber blankets, as consistent with SWPPP requirements. To minimize compaction, no equipment will be allowed to travel over or park on the salvaged soil stockpiles (see RM 3).

b) Areas within the existing fence line of the Lewis tank site are dominated by non-native invasive plant species. To reduce the potential for these species to cultivate new areas, this measure does not apply to Ben Lomond spineflower populations within the existing fence line of the Lewis tanks site.

To avoid or minimize impacts to MHJB, the District will implement the following A&MMs:

A&MM 4. Prior to construction, implement a construction fencing plan that demarcates construction access routes and staging areas such that inadvertent impacts to suitable habitat for MHJB are avoided. Install construction fencing prior to work and maintain fencing throughout the construction period.

A&MM 5. The District will salvage the soil within the approximately 0.11-acre area proposed for use by the temporary tanks that has not already been salvaged for Ben Lomond spineflower restoration (A&MM 3). Topsoil (top 6-8 inches) will be carefully removed by an experienced operator using a dragline, excavator, scraper, or dozer and will be stockpiled in uncompacted piles less than 4 feet tall. Stockpiled soils will be placed on top of an impervious surface, such as a tarp, within temporary disturbance areas. Topsoil stockpiles will be stabilized by spraying with a tackifier (soil stabilizer) or covered with a permeable natural material, such as jute or coconut fiber blankets, as consistent with SWPPP requirements. To minimize compaction, no equipment will be allowed to travel over or park on the salvaged soil stockpiles (see RM 3).

A&MM 6. Implement Worker Environmental Awareness Training: A qualified biologist will conduct training sessions to familiarize all construction personnel with the following: identification of MHJB, Santa Cruz kangaroo rat, SFDW, Ben Lomond spineflower, silverleaf manzanita, Ben Lomond buckwheat, and other protected wildlife and plants, as well as their habitat, general provisions and protections afforded by the Endangered Species Act (ESA), measures implemented to protect the species, penalties for violation of the ESA, reporting requirements, and a review of project footprint boundaries. the District and/or their contractor(s) will require all construction employees to participate in the training prior to working on-site.

A&MM 7. If ground disturbing activities are conducted during the flight season of the MHJB, cover exposed soil nightly to avoid impacts to dispersing males. Adult male MHJB actively search

for mates and breed during the evenings for approximately 12-14 weeks between May 1 and August 30. During this period, males and females may burrow into duff and soils at relatively shallow depths for protection during the daytime hours. Every attempt will be made to conduct soil disturbing aspects of the project outside of the adult flight season (May to August). If construction occurs during any part of the flight season, tarps or other impervious material will be used to cover open soil each night by 7:00 p.m. This will prevent adult males from burrowing into the exposed area and then being impacted by subsequent soil disturbance (digging, grading, or covering).

A&MM 8. A qualified biologist will be on site during all ground-disturbing activities to capture any MHJB observed in the construction areas and relocate them outside to intact sandhills habitat that supports appropriate soils and vegetation.

To provide compensation for impacts to Ben Lomond spineflower plants/seedbank and MHJB suitable habitat the District will implement the following restoration measures (RM):

RM 1. To quantify the incidental take at the end of the project, a qualified biologist will calculate the area of soil disturbance (and thus incidental take) and count the number of MHJB that were observed during tank installation.

RM 2. To compensate for impacts to MHJB habitat impacts at the Lewis tank site the District will set aside 28,850.64 ft2 (0.67-acre) of habitat within the 6.7-acre conservation area at the Olympia Wellfield. Setting aside 21,788.94 ft2 (0.51-acre) of habitat within the conservation area will offset the permanent habitat loss at a 3:1 ratio, which is appropriate given the moderate quality of habitat at the site. The temporary impacts of this project will be compensated for at a 1:1 ratio, which reflects the fact that the habitat to be impacted on site will be restored following the project. Prior to initiation of ground-disturbing activities associated with the project, the District will contribute $94,918.61 to the endowment that it will use to manage and monitor the 6.7-acre conservation area (Table 1).

Table 1. Endowment Contribution for the Lewis Tank Replacement Project

Project Component	**Habitat Impacts**	**Area of Impact**		**Mitigation Ratio**	**Area of Mitigation**		**Endowment Contribution**	
		Area (ac)	Area (ft^2)		Area (ac)	Area (ft^2)	Per Square Foot	Total
Lewis Tank Replacement	Permanent	0.17	7,262.98	3:1	0.51	21,788.94	$3.29	$71,685.61
Temporary Tank	Temporary	0.11	4,802.00	1:1	0.11	4,802.00	$3.29	$15,798.58
Staging/Construction Easement	Temporary	0.05	2,259.70	1:1	0.05	2,259.70	$3.29	$7,434.41
TOTAL		**0.33**	**14,324.68**		**0.67**	**28,850.64**		**$94,918.61**

RM 3. Following completion of the project, the District will restore the estimated 0.08-acre area of temporary disturbance that is outside of the existing fence line and access road, at the Lewis tank site. Restoration activities will occur for three years, to enable native plant regeneration to occur. The restoration is anticipated to include dispersal of any site-collected Ben Lomond spineflower seed and salvaged topsoil (A&MM 3 and 5) into the non-road portions of the temporary disturbance area.

The District will work with a qualified biologist to develop a more detailed proposal for review by the Service that outlines the specific habitat restoration and monitoring activities. The proposal will also include updating the Sandhills Projects database that the District created to help the Service and others track Sandhills conservation and mitigation projects, to include this and other sandhills conservation and mitigation projects that have been conducted since the database was created and submitted to the Service in 2014.

Implementation of these avoidance, minimization, and restoration measures would reduce potential impacts to MHJB and Ben Lomond spineflower to a less than significant level under CEQA. In addition, implementation of these measures would also reduce or avoid potential impacts to silverleaf manzanita, SFDW, Santa Cruz kangaroo rat, Ben Lomond buckwheat, and raptors and other nesting birds.

This page left intentionally blank

REFERENCES

Baldwin et al. 2012. *The Jepson Manual: Vascular Plants of California, Edition 2*

CDFW. 2008. California Wildlife Relationships System: Life History Accounts. Database Version 8.2.

CDFW. 2009. Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959

CDFW. 2019a. California Natural Diversity Database Rare Find 5 Report.

CDFW. 2019b. Special Animals List. Available online at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf

CDFW. 2019c. California Natural Communities List. Available online at: https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities

California Native Plant Society (CNPS). 2001. Botanical Survey Guidelines. Available Online at: http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf

Carraway, L. N., and B. J. Verts. 1991. Neotoma fuscipes . Mammalian Species 386:1-10.

CNPS. 2019. Inventory of Rare and Endangered Plants (online inventory, 8th edition). California Native Plant Society. Sacramento, CA. Available online at: http://www.rareplants.cnps.org/

District. 2019. *Mitigated Negative Declaration and Responses to Comments Received Probation Tank Replacement Project.*

Hawbecker, A. C. 1940. The burrowing and feeding habits of Dipodomys venustus. J. Mammal., 21:388-396.

McGraw, 2016. Biological Assessment for Lewis Tank #1, near 10011 West Drive Felton, CA (APNs: 075-311-06), Jodi McGraw Consulting.

McGraw. 2017. *Final Low-Effect Habitat Conservation Plan for the San Lorenzo Valley Water District's Probation Tank Replacement Project*.

Remsen, J.V. Jr. 1978. Bird species of special concern in California. California Dept. of Fish and Game, Nongame Wildlife Investigations, Wildlife Management Branch Administrative Report No. 78-1.

Roest, M. L. 1988. Recent records of the Santa Cruz kangaroo rat, *Dipodomys venustus venustus*, in Santa Cruz County. Calif. Fish and Game. 74:177-179.

Rudd, R. L. 1948. The mammals of Santa Cruz County, California. M.A. thesis, University of California, Berkeley, CA. 209 pp.

San Lorenzo Valley Water District (District) 2017. Final Mitigated Negative Declaration and Response to Comments Received Probation Tank Replacement Project.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A manual of California vegetation 2nd Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

Thelander, C. (ed.). 1994. Life on the edge: A guide to California's endangered natural resources: wildlife. BioSystems Books, Santa Cruz, CA.

U.S. Fish and Wildlife Service (Service). 2000. *Guidelines for Conducting and Reporting Botanical Inventories for Federally listed, Proposed and Candidate Plants.* https://www.fws.gov/panamacity/resources/GuidelinesBotanical.pdf

Service. 2019. IPaC Resources List for the Survey areas.

Williams, D. 1986. Mammalian species of special concern in California. California Department of Fish and Game Report 86-1. 112 pp.

Williams, D. F., D. J. Germano, and W. Tordoff. 1993b. Population studies of endangered kangaroo rats and blunt-nosed leopard lizards in the Carrizo Plain natural area, California. Calif. Depart. Fish and Game, Nongame Bird and Mammal Section Report, 93-01, 1-114 pp.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (eds.). 1988. California's wildlife, Volume I: Amphibians and reptiles. California Department of Fish and Game, Sacramento, California. 272 pp.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (eds.). 1990. California's Wildlife, Volume II: Birds. California Department of Fish and Game, Sacramento, California.731 pp.

This page left intentionally blank

APPENDIX A

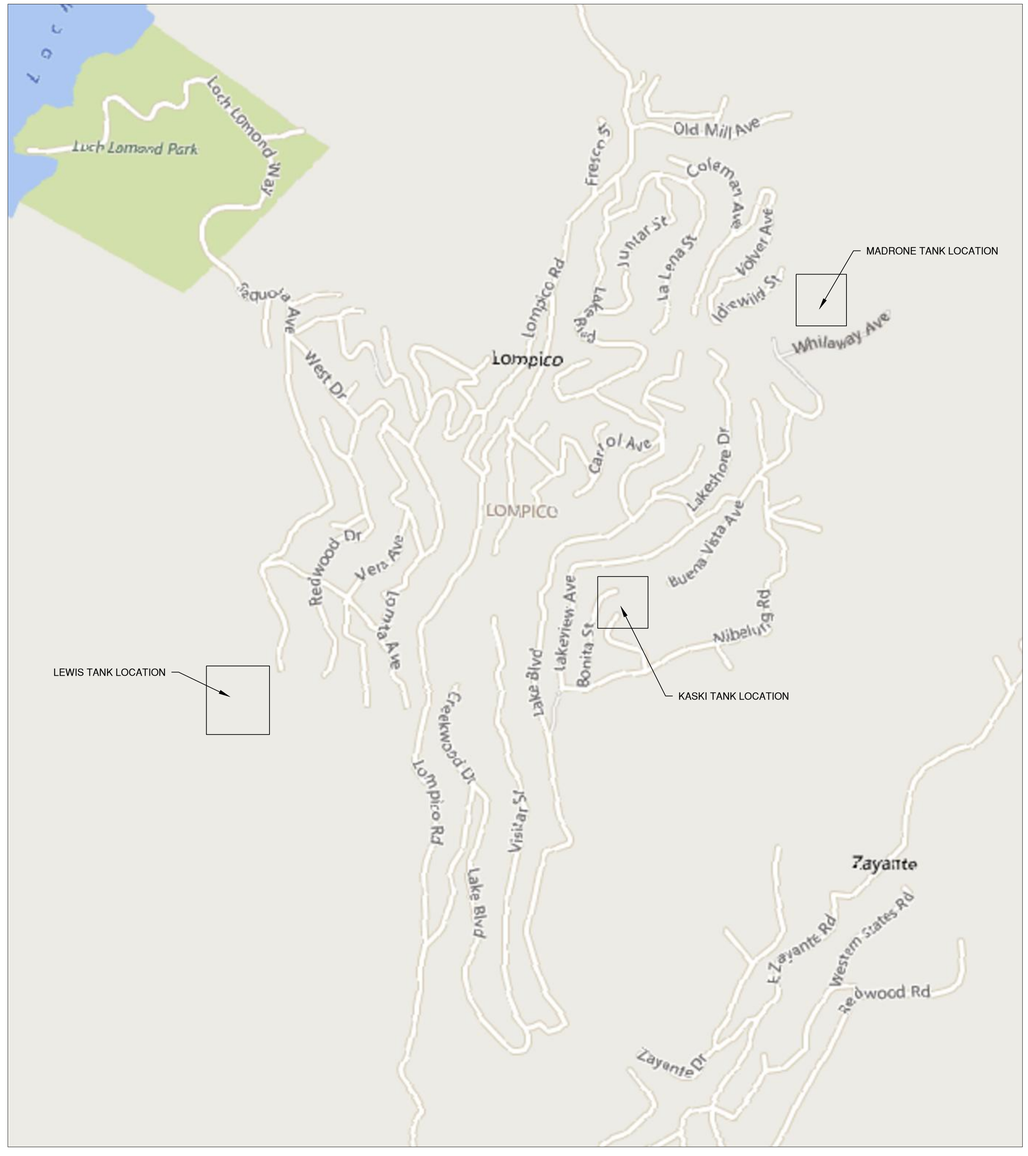
LOMPICO TANKS PROJECT PLANS

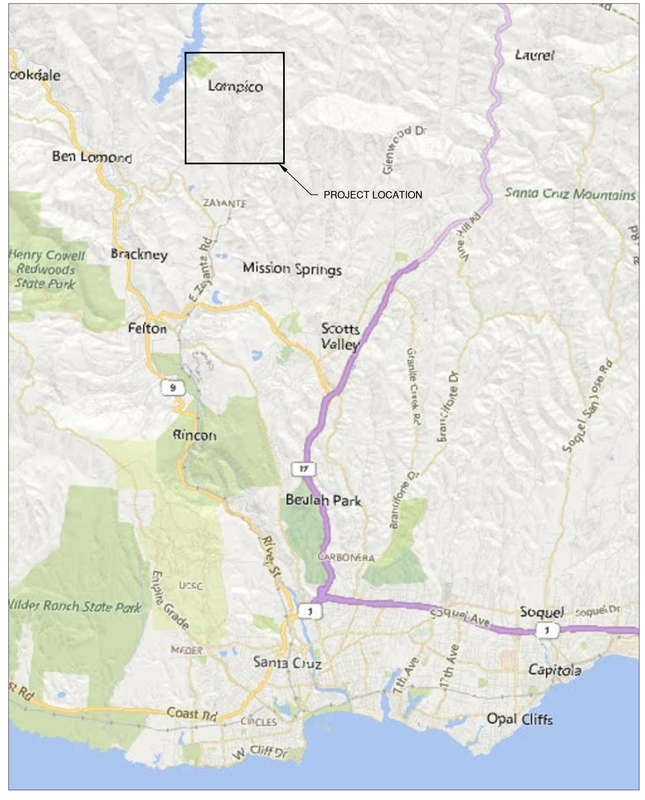
SAN LORENZO VALLEY WATER DISTRICT
LOMPICO TANKS REPLACEMENT

OWNER:
SAN LORENZO VALLEY WATER DISTRICT (SLVWD)
(831) 338-2153
13060 HIGHWAY 9
BOULDER CREEK, CA 95006

CIVIL ENGINEER:
SCHAAF & WHEELER
(831) 883-4848
3 QUAIL RUN CIRCLE, SUITE 101
SALINAS, CA 93907

GEOTECH ENGINEER:
PACIFIC CREST ENGINEERING INC.
(831) 722-9446
444 AIRPORT BLVD., SUITE 106
WATSONVILLE, CA 95076





VICINITY MAP

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER — JAMES A. STERLING — No. 61703 — CIVIL — STATE OF CALIFORNIA

TITLE SHEET

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

DESIGNED BY:	CJM	DATE: 05/29/2019
DRAWN BY:	CJM	DATE: 05/29/2019
QC CHECKED BY:	AAS	DATE: 05/29/2019
PROJECT NO.:		
SCALE:	NO SCALE	
SUBMITTAL:	60% SUBMITTAL	

G1.0

SHEET 1 OF 25

ABBREVIATIONS

AB	AGGREGATE BASE	LOC	LOCATION
AC	ASPHALT CONCRETE	MB	MAILBOX
APPROX	APPROXIMATE	MSB	MAIN SWITCHBOARD
AWWA	AMERICAN WATERWORKS ASSOC	MH	MANHOLE
BLDG	BUILDINGS	MAX	MAXIMUM
BLRDS	BOLLARDS	MJ	MECHANICAL JOINT
BTFLY	BUTTERFLY	MIN	MINIMUM
BTW	BETWEEN	MIP	MALE IRON PIPE
CL	CENTERLINE	MCC	MOTOR CONTROL CENTER
COM	COMMUNICATION	N	NORTH
CP	CONTROL POINT	(N)	NEW
CV	CHECK VALVE	N.I.C	NOT IN CONTRACT
CVR	COVER	NPT	NATIONAL PIPE THREAD
CLR	CLEAR	NSHT	NATIONAL STANDARD HOSE THREAD
CMP	CORRUGATED METAL PIPE	NTS	NOT TO SCALE
CONC	CONCRETE	O.C.	ON CENTER
CPT	CONTROL POINT	OD	OUTSIDE DIAMETER
CFS	CUBIC FEET PER SECOND	OH	OVERHEAD
CYC	CYCLONE	PNL	PANEL
DL	DAYLIGHT	PE	PLAIN END, POLYETHYLENE
DET	DETAIL	PVC	POLY-VINYL CHLORIDE
DIA	DIAMETER	PSI	POUNDS PER SQUARE INCH
DBL	DOUBLE	PP	POWER POLE
DWGS	DRAWINGS	(P)	PROPOSED
DWY	DRIVEWAY	RED	REDUCER
DI	DUCTILE IRON	RCP	REINFORCED CONCRETE PIPE
DIP	DUCTILE IRON PIPE	R/W	RIGHT-OF-WAY
EA	EACH	RSR	RISER
EP	EDGE OF PAVEMENT	RD	ROAD
ESMT	EASEMENT	SCH	SCHEDULE
E	EAST	SPECS	SPECIFICATIONS
EP	EDGE OF PAVEMENT	SS	SANITARY SEWER
ELEC, ELECT	ELECTRICAL	SSCO	SANITARY SEWER CLEANOUT
EL,ELEV	ELEVATION	SSFM	SANITARY SEWER FORCE MAIN
ELL	ELBOW	SSMH	SANITARY SEWER MANHOLE
EQUIP	EQUIPMENT	SRVP	SERVICE POLE
(E)	EXISTING	SP	STATIC PRESSURE
(F)	FUTURE	STA	STATION
FIPT	FEMALE IRON PIPE THREAD	STD	STANDARD
FNPT	FEMALE NATIONAL PIPE THREAD	STL	STEEL
FEN	FENCE	SD	STORM DRAIN
FF	FINISH FLOOR	SL	STREET LIGHT
FLG, FL	FLANGE	STS	STREET NAME SIGN
FL, FLR	FLOW LINE	TCE	TEMPORARY CONSTRUCTION EASEMENT
GAL	GALLON(S)	TOD	TOP OF DITCH
GPM	GALLONS PER MINUTE	TOS	TOP OF SLOPE
GALV	GALVANIZED	TS	TRAFFIC SIGN
GV	GATE VALVE	TYP	TYPICAL
GB	GRADE BREAK	VLTS	VAULTS
GS	GALVANIZED STEEL	W	WATER
HW	HEADWALL	WM	WATER MAIN
HP	HORSEPOWER	W/	WITH
HDPE	HIGH-DENSITY POLYETHYLENE	WSP	WELDED STEEL PIPE
ID	INSIDE DIAMETER	WD	WOOD
INV	INVERT	WDFE	WOOD FENCE
IW	INDUSTRIAL WASTE		
IPS	IRON PIPE SIZE		

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	EASEMENT	
	TEMPORARY CONSTRUCTION EASEMENT	TCE
	PROPERTY LINE - R/W	
	LIMIT OF WORK	
X X X X	CYCLONE FENCE	X X
	WOOD FENCE	
W	WATER LINE	W W
	FUTURE WATER LINE	W W
OHE	(E) OVERHEAD ELECTRIC	OHE
181.44	SPOT ELEVATION	181.44
	DRAIN PIPE	
	REMOVE	
	EDGE OF (E) PAVEMENT	
	MAJOR CONTOUR LINE (TOPO)	
	MINOR CONTOUR LINE (TOPO)	
E	BURIED ELECTRIC	
T	TELEPHONE	
OH	OVERHEAD COMMUNICATION	
	VEGETATION	
SD	STORM DRAIN PIPE	SD
	VAULT	
	MANHOLE	
	CONTROL POINT	
	FOUND MONUMENT AS NOTED	
60"K	EXISTING TREE & TYPE	
4",6"K	TREE CLUSTER WITH SIZE	
CYP	CYPRESS	
K	OAK	
P	PINE	
RDWD	REDWOOD	
T	TREE (MISC)	

SCOPE OF WORK

1. PROVIDE TEMPORARY WATER TANKS AND ABOVE-GRADE PIPELINES AND VALVES
2. DEMOLISH AND REMOVE THE EXISTING REDWOOD WATER TANKS, CONCRETE FOUNDATIONS, FENCES, YARD PIPING AND SURFACE IMPROVEMENTS.
3. HARVEST AND REMOVE TREES AS NOTED ON THE PLANS.
4. DEMOLISH AND REMOVE THE EXISTING TREATMENT BUILDING AND EQUIPMENT AT THE LEWIS TANK SITE.
5. DESTROY LOMPICO WELL NO. 5 AT THE LEWIS TANK SITE.
6. GRADE AND COMPACT THE TANK SITES.
7. PROVIDE NEW BOLTED STEEL WATER TANKS ON CONCRETE RING FOUNDATIONS, WITH APPURTENANCES, YARD PIPING, SITE PAVING AND FENCING.
8. REMOVE AND RELOCATE THE TEMPORARY PIPELINES

CONSTRUCTION SEQUENCE

1. HARVEST AND REMOVE TREES AT THE MADRONE SITE.
2. INSTALL TEMPORARY TANKS AT THE MADRONE SITE.
3. DEMOLISH AND REMOVE EXISTING MADRONE TANKS.
4. CONSTRUCT NEW MADRONE TANKS AND ALL SITE WORK.
5. RELOCATE TEMPORARY TANKS TO KASKI SITE.
6. HARVEST AND REMOVE TREES AT THE KASKI SITE.
7. DEMOLISH AND REMOVE EXISTING KASKI TANKS.
8. CONSTRUCT NEW KASKI TANKS AND ALL SITE WORK.
9. DESTROY LOMPICO WELL NO. 5 (CONCURRENT WITH PRECEDING ITEMS)
10. RELOCATE TEMPORARY TANKS TO LEWIS SITE.
11. HARVEST AND REMOVE TREES AT THE LEWIS SITE.
12. DEMOLISH AND REMOVE EXISTING LEWIS TANKS, BUILDING AND SITE IMPROVEMENTS.
13. CONSTRUCT NEW LEWIS TANKS AND ALL SITE WORK.
14. REMOVE TEMPORARY TANKS AND PIPING.

SHEET INDEX

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER — JOSEPH A. STEFANI — No. 68703 — CIVIL — STATE OF CALIFORNIA — 6/30/20

LEGEND, ABBREVIATIONS, & SHEET INDEX

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

DESIGNED BY:	CJM	DATE: 05/29/2019
DRAWN BY:	CJM	DATE: 05/29/2019
QC CHECKED BY:	AAS	DATE: 05/29/2019
PROJECT NO.:		
SCALE:	NO SCALE	
SUBMITTAL:	60% SUBMITTAL	

G1.1

SHEET 2 OF 25

GENERAL NOTES:

1. SHOULD IT APPEAR THAT THE WORK TO BE PERFORMED OR ANY MATTER RELATIVE THERETO, IS NOT SUFFICIENTLY DETAILED OR EXPLAINED ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE DISTRICT ENGINEER AT 831-338-2153 WITH ANY QUESTIONS OR DISCREPANCIES. ANY REVISIONS REQUIRE OWNER'S APPROVAL BEFORE PROCEEDING WITH REVISED PLANS.
2. UNAUTHORIZED CHANGES AND USES: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THESE PLANS MUST BE MADE IN WRITING AND APPROVED BY THE PREPARER OF THESE PLANS.
3. CONSTRUCTION CONTRACTOR AGREES THAT THE IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONSTRUCTION CONTRACTOR SHALL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY OF THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD THE CIVIL ENGINEER AND THE OWNER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE CIVIL ENGINEER.
4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ACCEPTED WORKMANSHIP PRACTICE AND THESE PLANS. ORDERS GIVEN BY THE OWNER REPRESENTATIVE RELATING TO THE QUALITY OF MATERIALS AND WORKMANSHIP SHALL BE COMPLIED WITH PROMPTLY BY THE CONTRACTOR.
5. CONTRACTOR SHALL POSSESS A VALID CLASS A - GENERAL ENGINEERING CONTRACTOR LICENSE AT THE TIME THE CONTRACT IS AWARDED AND SHALL MAINTAIN THROUGHOUT THE LENGTH OF CONTRACT. SUB-CONTRACTORS SHALL POSSES VALID LICENSE(S) FOR THE PORTION(S) OF THE WORK THEY ARE PERFORMING.
6. THE CONTRACTOR SHALL POST EMERGENCY TELEPHONE NUMBERS AT THE JOB SITE FOR PUBLIC WORKS, AMBULANCE, POLICE AND FIRE DEPARTMENTS. CONTRACTOR SHALL POST SIGN AT JOB SITE BEARING OWNER'S NAME AND SITE ADDRESS. PROPERTY CORNERS SHALL BE CLEARLY MARKED.
7. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND LICENSES REQUIRED FOR THE CONSTRUCTION AND COMPLETION OF THE PROJECT.
8. CONTRACTOR SHALL CONFORM TO THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERS PERTAINING TO EXCAVATION AND TRENCHING. CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR TRENCH SHORING DESIGN AND INSTALLATION.
9. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF THE DIVISION OF INDUSTRIAL SAFETY PERTAINING TO "CONFINED SPACES". ANY MANHOLE, CULVERT, DROP INLET OR TRENCH (WHICH COULD CONTAIN AIR) THAT IS NOT READILY VENTILATED MAY BE CONSIDERED A "CONFINED SPACE".
10. EXCAVATION SHALL BE ADEQUATELY SHORED, BRACED AND SHEETED SO THAT THE EARTH WILL NOT SLIDE OR SETTLE AND SO THAT ALL EXISTING IMPROVEMENTS OF ANY KIND WILL BE FULLY PROTECTED FROM DAMAGE. ANY DAMAGE RESULTING FROM A LACK OF ADEQUATE SHORING, BRACING AND SHEETING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND HE SHALL EFFECT NECESSARY REPAIRS OR RECONSTRUCTION AT HIS OWN EXPENSE. WHERE THE EXCAVATION FOR A CONDUIT TRENCH, STRUCTURE AND/OR BORING AND JACKING PIT IS REQUIRED, THE CONTRACTOR SHALL CONFORM TO THE APPLICABLE CONSTRUCTION SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY OF THE STATE OF CALIFORNIA. THE CONTRACTOR SHALL ALWAYS COMPLY WITH OSHA REQUIREMENTS.
11. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. APPROVAL OF THESE PLANS BY THE AGENCY DOES NOT GUARANTEE THE ACCURACY, COMPLETENESS, LOCATION OR THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL DUE PRECAUTIONARY MEANS NECESSARY TO PROTECT EXISTING UTILITY LINES.
12. CONTRACTOR SHALL HAVE UTILITIES LOCATED BY CALLING UNDERGROUND SERVICE ALERT (USA) NORTH AT (800) 227-2600 OR 811 AT LEAST 48-HOURS PRIOR TO START OF CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ENGINEER AND THE OWNER OF ANY DIFFERENCES IN THE LOCATIONS OF EXISTING UTILITIES SHOWN, OR ANY CONFLICTS WITH THE DESIGN, BEFORE CONTINUING WITH WORK IN THAT AREA.
13. SHOULD IT APPEAR THAT THE WORK TO BE DONE, OR ANY MATTER RELATIVE THERETO, IS NOT SUFFICIENTLY DETAILED OR EXPLAINED ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE ENGINEER AT (831) 883-4848 FOR SUCH FURTHER EXPLANATIONS AS MAY BE NECESSARY.
14. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN AND OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY AND TO MAINTAIN TRAFFIC CONTROL AT ALL TIMES.
15. THE CONTRACTOR SHALL NOT DESTROY ANY PERMANENT SURVEY POINTS. ANY PERMANENT MONUMENTS OR POINTS DESTROYED SHALL BE REPLACED BY A LICENSED ENGINEER OR LICENSED SURVEYOR AT THE CONTRACTOR'S EXPENSE.
16. DURING GRADING OPERATIONS, THE CONTRACTOR SHALL IMPLEMENT DUST CONTROL MEASURES ON SITE AND ON HAUL ROUTES.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AN AIRBORNE DUST NUISANCE FROM THE CONSTRUCTION SITE BY WATERING AND/OR TREATING THE SITE IN SUCH A MANNER TO LIMIT THE EXTENT OF AIRBORNE DUST PARTICLES.
18. SITE WORK HOURS ARE 8:00 A.M. TO 5:00 P.M. MONDAY THRU FRIDAY. NO SITE WORK SHALL BE PERFORMED ON SATURDAYS, SUNDAYS OR OBSERVED NATIONAL HOLIDAYS WITHOUT PRIOR WRITTEN CONSENT OF THE OWNER.
19. THE WORK SITE SHALL BE CONTINUALLY MAINTAINED AND KEPT FREE OF TRASH AND CLUTTER. SOLID WASTE SHALL BE STORED IN CLOSED CONTAINERS AND TRANSPORTED TO AN APPROVED DUMPSITE ON A REGULAR BASIS.
20. THESE PLANS SHOW EXISTING FEATURES INCLUDING BUT NOT LIMITED TO TREES, UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION OR PLACEMENT OF THE PROPOSED ENGINEERED IMPROVEMENTS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE TO IMMEDIATELY NOTIFY THE ENGINEER IF THERE ARE ANY EXISTING FACILITIES, WHETHER SHOWN OR NOT SHOWN ON THESE PLANS, WHICH COULD IN ANY WAY BE IN POTENTIAL CONFLICT WITH THE DESIGN ON THESE PLANS. ALL WORK WITHIN THE VICINITY OF POTENTIAL CONFLICT SHALL CEASE UNTIL AN ADEQUATE AND APPROPRIATE SOLUTION IS DETERMINED BY THE ENGINEER/OWNER'S REPRESENTATIVE AND APPROVED BY THE OWNER.
21. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SITE STORM WATER POLLUTION PREVENTION AND IMPLEMENTING NECESSARY BEST MANAGEMENT PRACTICES. EROSION CONTROL MEASURES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY. WET SEASON CONTROLS ARE REQUIRED (MINIMUM) BETWEEN OCTOBER 15 AND APRIL 15.
22. THE CONTRACTOR SHALL COMPLY WITH ALL RULES, REGULATIONS AND PROCEDURES OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) FOR MUNICIPAL, CONSTRUCTION AND INDUSTRIAL ACTIVITIES AS PROMULGATED BY THE CALIFORNIA STATE WATER RESOURCES CONTROL BOARD OR ANY OF ITS' REGIONAL WATER QUALITY CONTROL BOARDS. REFER TO THE FOLLOWING GENERAL PERMITS
    a. WQO 2009-0009-DWQ, GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES, WITH AMENDMENTS
    b. WQO 2013-0001-DWQ, GENERAL PERMIT FOR STORM WATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S)
    c. WQO 2014-0194-DWQ, NPDES PERMIT FOR DRINKING WATER DISCHARGES TO WATERS OF THE UNITED STATES
18. IF ARCHAEOLOGICAL RESOURCES OR HUMAN REMAINS ARE DISCOVERED DURING CONSTRUCTION, THE COUNTY CORONER SHALL BE NOTIFIED AND WORK SHALL BE HALTED TO WITHIN 150-FEET OF THE FIND UNTIL IT CAN BE EVALUATED BY A QUALIFIED PROFESSIONAL ARCHAEOLOGIST. IF THE FIND IS SIGNIFICANT, APPROPRIATE MITIGATION MEASURES SHALL BE FORMULATED AND IMPLEMENTED.
19. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL CERTIFY THAT ALL WORK WAS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL SUBMIT TWO SETS OF 'RED-LINE AS-BUILT PLANS SHOWING ALL CHANGES TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF THE IMPROVEMENTS.
20. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO KEEP PUBLIC STREETS FREE FROM DIRT AND DEBRIS. SHOULD ANY DIRT OR DEBRIS BE DEPOSITED IN PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL REMOVE IT IMMEDIATELY.
21. CONTRACTOR SHALL REPLACE, AT HIS EXPENSE, ALL TREES, SHRUBS, LAWNS, FENCES, IRRIGATION SYSTEMS AND IMPROVEMENTS WHICH ARE TO REMAIN INTACT BUT ARE REMOVED OR DAMAGED DURING CONSTRUCTION. CONTRACTOR SHALL NOT REMOVE OR DAMAGE IMPROVEMENTS LOCATED WITHIN THE PROPERTY WITHOUT WRITTEN PERMISSION FROM THE OWNER.
22. COORDINATE WITH THE OWNER FOR TEMPORARY CONSTRUCTION STORAGE AREAS .
23. MAINTAIN ONE-WAY TRAFFIC ON PUBLIC AND PRIVATE ROADS, PAVED OR UNPAVED, ON WHICH WORK IS BEING PERFORMED DURING WORKING HOURS, OR COORDINATE WITH OWNER TO PROVIDE AN ACCEPTABLE DETOUR ROUTE AROUND THE WORKING AREA. MAINTAIN NORMAL TRAFFIC TRAVEL WIDTH DURING NON-WORKING HOURS. REFER TO ENCROACHMENT PERMITS, LICENSES, EASEMENT CONDITIONS AND TRAFFIC PLANS, WHERE APPLICABLE, AS INCLUDED IN THE SPECIFICATIONS.
24. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS. THE FOLLOWING LIST OF STANDARDS ARE/OR SPECIFICATIONS ARE INCORPORATED INTO THESE PLANS BY REFERENCE. DESIGN AND CONSTRUCTION OF ALL IMPROVEMENTS SHALL COMPLY WITH ALL APPLICABLE STANDARDS INCLUDING:
    a. CALIFORNIA WATER WORKS STANDARDS (CALIFORNIA CODE OF REGULATIONS, TITLES 17 AND 22)
    b. AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS
    c. STANDARD SPECIFICATIONS, STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION, 2018 EDITION
    d. STANDARD PLANS, STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS), 2018 EDITION
    e. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS (CAL OSHA)
32. ALL UNDERGROUND FACILITIES SHALL BE INSTALLED PRIOR TO THE FINAL PREPARATION OF SUBGRADE AND PLACEMENT OF BASE MATERIAL. VALVE BOX ELEVATIONS (IF SHOWN) ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING COVERS TO THE FINAL PAVEMENT GRADE.
33. WHEN REPLACING EXISTING PAVEMENT, THE EXISTING PAVEMENT SHALL BE CUT TO A NEAT LINE AND REMOVED BACK TO AN EXISTING ADEQUATE STRUCTURAL SECTION. AN EXPLORATORY TRENCH OR POTHOLING MAY BE REQUIRED TO DETERMINE THE LIMITS OF PAVEMENT REMOVAL.
34. CONTRACTOR IS RESPONSIBLE FOR FOR MATCHING EXISTING PAVEMENTS AND OTHER IMPROVEMENTS WITH A SMOOTH TRANSITION IN PAVING, CURBS, GUTTERS, GRADING, ETC. AND TO AVOID THE CREATION OF LOW SPOTS, HAZARDOUS CONDITIONS OR ABRUPT OR APPARENT CHANGES IN APPEARANCE, GRADES OR CROSS-SLOPES.
35. IMPROVEMENTS ARE SUBJECT TO INSPECTION AND APPROVAL BY OWNER'S ENGINEER AND THE OFFICE OF THE STATE FIRE MARSHAL. NOTIFY THE APPLICABLE JURISDICTION(S) AT LEAST 48-HOURS PRIOR TO THE START OF WORK TO ARRANGE FOR INSPECTION.
36. TREE REMOVAL...

GRADING NOTES:

1. THE WORK OF THIS PROJECT INCLUDES TANK FOUNDATION OVER-EXCAVATION AND RECOMPACTION, UTILITY TRENCH EXCAVATION AND BACKFILLING. TOTAL GRADING (CUT AND FILL) IS APPROXIMATELY 250 CUBIC YARDS AT LEWIS, 200 CUBIC YARDS AT KASKI, AND 40 CUBIC YARDS AT MADRONE.
2. ALL GRADING, EROSION CONTROL, SITE PREPARATION AND PLACING AND COMPACTION OF FILL SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT ENTITLED "GEOTECHNICAL INVESTIGATION", PREPARED BY PACIFIC CREST ENGINEERING INC., DATED DECEMBER 10, 2018. THIS WORK SHALL BE UNDER THE DIRECT SUPERVISION OF THE SOILS ENGINEER SUBSEQUENT TO COMPLETION OF THE WORK. THE GEOTECHNICAL ENGINEER SHALL SUBMIT A REPORT TO THE OWNER STATING THAT ALL WORK HAS BEEN DONE TO HIS OR HER SATISFACTION.
3. GEOTECHNICAL ENGINEER SHALL BE PRESENT DURING EARTHWORK. ONCE SITE IS ROUGH GRADED, GEOTECHNICAL ENGINEER SHALL DETERMINE ANY REVISIONS TO FOUNDATION AND OVEREXCAVATION PRIOR TO CO0NTRACTOR BEGINNING WORK ON STRUCTURAL FOUNDATIONS. GEOTECHNICAL ENGINEER SHALL PROVIDE WRITTEN GUIDANCE IF SOIL CONDITIONS DIFFER FROM WHAT IS PRESENTED IN THE GEOTECHNICAL INVESTIGATION REPORT.
4. THE CONTRACTOR SHALL PROVIDE THE CONSTRUCTION STAKES. THE NUMBER AND LOCATION OF STAKES REQUIRED SHALL BE DETERMINED BEFORE THE CONSTRUCTION BEGINS. ALL CONSTRUCTION STAKING SHALL BE DONE BY A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR.
5. ALL EXISTING ELEVATIONS SHOWN ARE AS MEASURED IN THE FIELD, UNLESS NOTED OTHERWISE.
6. ALL GRADES SHOWN ARE FINISHED GRADES, UNLESS OTHERWISE NOTED.
7. ALL STATIONING AND DISTANCES INDICATED ON THE DRAWINGS ARE BASED ON HORIZONTAL MEASURED FEET.
8. ALL GRADING, EROSION CONTROL, SITE PREPARATION, AND PLACING AND COMPACTION OF FILL SHALL BE DONE IN ACCORDANCE WITH CHAPTER 16.20 OF THE SANTA CRUZ COUNTY, CA CODE OF ORDINANCES.
9. CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE OWNER AT LEAST TWO WORKING DAYS PRIOR TO THE START OF WORK.
8. CLEAR SURFACE VEGETATION AND STRIP TOPSOIL TO BOTTOM OF ROOT ZONE WITHIN GRADING AREAS. STOCKPILE TOPSOIL ON-SITE FOR FUTURE USE. CHIP AND SPREAD REMOVED VEGETATION WITHIN THE LIMITS OF THE WORK.
9. STRUCTURAL FILL AREAS SHALL BE SCARIFIED TO A DEPTH OF 18-INCHES, MOISTURE CONDITIONED AND COMPACTED.
10. CLEAN NATIVE MATERIAL MEETING THE REQUIREMENTS LISTED IN THE GEOTECHNICAL REPORT MAY BE USED AS STRUCTURAL FILL. IMPORTED STRUCTURAL FILL, IF NEEDED, SHALL MEET THE REQUIREMENTS LISTED IN THE GEOTECHNICAL REPORT.
11. BEDDING FOR UNDERGROUND UTILITIES SHALL BE IMPORTED SAND MATERIAL (MINIMUM S.E. = 30) UNLESS OTHERWISE APPROVED BY THE ENGINEER. BEDDING SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 95% AS BASED UPON ASTM TEST DESIGNATION D1557, MODIFIED PROCTOR.
12. BACKFILL FOR UTILITY TRENCHES UNDER PAVEMENTS SHALL BE CLEAN NATIVE MATERIAL OR CLASS 2 AGGREGATE BASE FOR FULL TRENCH DEPTH TO THE PAVEMENT SUBGRADE, COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 95%, MODIFIED PROCTOR. BACKFILL FOR UTILITY TRENCHES IN NON-PAVED AREAS SHALL BE CLEAN NATIVE MATERIAL OR IMPORTED SAND MATERIAL (MINIMUM S.E. = 30), UNLESS OTHERWISE APPROVED BY THE ENGINEER, COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 90%, MODIFIED PROCTOR.
13. ALL SURPLUS AND UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE SITE.
14. EXCESS NATIVE SOIL FROM TRENCHES SHALL REMAIN ON-SITE. COORDINATE WITH FAIRGROUNDS STAFF FOR STOCKPILE LOCATION.
15. CONTRACTOR SHALL NEITHER WASTE NOR DEPOSIT ANY HAZARDOUS MATERIALS ON THE GRADING SURFACES OR WITHIN THE GRADED CUT AND FILL AREAS OF THIS PROJECT, INCLUDING BUT NOT LIMITED TO GASOLINE OR DIESEL FUELS, MOTOR OILS OR TRANSMISSION FLUIDS, ANTIFREEZE, HYDRAULIC FLUIDS, LUBRICANTS, STARTING FLUIDS AND FILTERS, AND/OR CONTAINERS FOR THESE PRODUCTS. HAZARDOUS MATERIAL SPILLS THAT OCCUR AS A RESULT OF EITHER EQUIPMENT FAILURES OR VANDALISM, INCLUDING ALL ADJACENT CONTAMINATED SOILS, SHALL BE EXCAVATED AND PACKAGED FOR DISPOSAL AT AN ENVIRONMENTALLY APPROVED DISPOSAL SITE. MATERIALS SHALL NOT BE TRANSPORTED OFF THE SITE UNTIL THEY ARE CATALOGED AND APPROVED BY THE CONSTRUCTION MANAGER. ALL REMOVAL, PACKAGING, TRANSPORTATION AND DISPOSAL COSTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
16. ALL DISTURBED AREAS SHALL BE RE-SEEDED WITH THE FOLLOWING EROSION CONTROL MIX. APPLY 1 POUND PER 800 SQUARE FEET:

SPECIES	COMMON NAME
FESTUCA RUBRA 'MOLATE'	RED FESCUE
POA SECUNDA	SANDBERG BLUEGRASS
VULPIA MICROSTACHYS	SMALL FESCUE
NASELLA PULCHRA	PURPLE NEEEDLEGRASS
MELICA IMPERFECTA	SMALLFLOWER MELIC

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

GENERAL NOTES

LOMPICO TANKS REPLACEMENT

SLVWD NO.

San Lorenzo Valley WATER DISTRICT

DESIGNED BY: CJM DATE: 05/29/2019
DRAWN BY: CJM DATE: 05/29/2019
QC CHECKED BY: AAS DATE: 05/29/2019
PROJECT NO.:
SCALE: NO SCALE
SUBMITTAL: 60% SUBMITTAL

G1.2

MATERIALS SPECIFICATIONS:

1. GENERAL MATERIAL REQUIREMENTS
   - 1.1. ALL PRODUCTS AND MATERIALS FURNISHED AS PART OF THE WORK INCLUDED IN THIS PLAN SET SHALL BE SUBMITTED TO OWNER REPRESENTATIVE FOR APPROVAL. SUBMITTALS SHALL INCLUDE BUT BE LIMITED TO: SHOP DRAWINGS, MATERIAL PROPERTIES, PRODUCT CUT SHEETS, INSTALLATION REQUIREMENTS AND OPERATION AND MAINTENANCE MANUALS. CONTRACTOR SHALL NOT PURCHASE NOR INSTALL ANY PRODUCTS OR MATERIALS WITHOUT PRIOR SATISFACTORY REVIEW DETERMINATION BY OWNER REPRESENTATIVE.
   - 1.2. ALL MATERIALS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE OWNER REPRESENTATIVE, AND SHALL NOT BE USED BEFORE BEING INSPECTED AND APPROVED BY THE INSPECTOR. OWNER HAS THE RIGHT TO PERFORM ANY TESTING NECESSARY TO TO ENSURE COMPLIANCE OF THE MATERIALS WITH THE MATERIALS SPECIFICATIONS. FAILURE OR NEGLECT ON THE PART OF THE OWNERS REPRESENTATIVE TO CONDEMN OR REJECT WORK MATERIALS NOT IN ACCORDANCE WITH THE MATERIALS SPECIFICATIONS SHALL NOT BE CONSTRUED TO IMPLY ACCEPTANCE SHOULD THEIR INFERIORITY BECOME EVIDENT AT ANY TIME. MATERIALS REJECTED BY THE OWNER REPRESENTATIVE SHALL BE IMMEDIATELY REMOVED FROM THE JOBSITE.
2. REFERENCE STANDARDS
   - 2.1. ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
   - 2.2. ASME - AMERICAN SOCIETY OF MECHANICAL ENGINEERS
   - 2.3. ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS
   - 2.4. AWWA - AMERICAN WATER WORKS ASSOCIATION
   - 2.5. FM - FM GLOBAL (FACTORY MUTUAL)
   - 2.6. HI - HYDRAULIC INSTITUTE
   - 2.7. IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
   - 2.12. ISO INTERNATIONAL STANDARDS ORGANIZATION
   - 2.13. NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
   - 2.14. NEC NATIONAL ELECTRICAL CODE
   - 2.15. NFPA - NATIONAL FIRE PROTECTION ASSOCIATION
   - 2.16. NSF - NSF INTERNATIONAL (NATIONAL SANITATION FOUNDATION)
   - 2.17. UL UNDERWRITERS LABORATORIES, INC.
3. CAST-IN-PLACE CONCRETE
   - 3.1. CONCRETE SHALL BE PORTLAND CEMENT CONCRETE, 3000 PSI AT 28 DAYS, MAX 3-INCH SLUMP, PER CALTRANS STANDARD 90-1.
   - 3.2. MAXIMUM AGGREGATE SIZE SHALL BE 1.5-INCH FOR FOUNDATIONS AND BASES AND 1-INCH FOR SLAB ON GRADE.
   - 3.3. REBAR SHALL BE DEFORMED STEEL PER CALTRANS SECTION 52.
   - 3.4. PLACE CONCRETE PER THE REQUIREMENTS OF CALTRANS SECTION 51.
   - 3.5. SUBMIT MIX DESIGN FOR APPROVAL PROPER TO CONSTRUCTION.
4. CEMENT SLURRY
   - 4.1. SAND-CEMENT SLURRY SHALL CONSIST OF ONE SACK (94-POUNDS) OF PORTALND CEMENT PER CUBIC YARD OF SAND, THOROUGHLY MIXED AND WITH SUFFICIENT MOISTURE FOR WORKABILITY.
5. GROUT
   - 5.1. PRE-PROPORTIONED, PREPACKAGED NON-SHRINK GROUTS.
   - 5.2. CEMENT GROUTS SHALL CONSIST OF PORTLAND CEMENT AND SAND, MIXED WITH WATER ON-SITE PER THE MANUFACTURER'S INSTRUCTIONS.
   - 5.3. EPOXY GROUTS SHALL CONSIST OF TWO-COMPONENT THERMOSETTING EPOXY RESIN AND INERT AGGREGATE, MIXED ON-SITE PER THE MANUFACTURER'S INSTRUCTIONS.
6. PRE-CAST CONCRETE STRUCTURES
   - 6.1. ALL PRECAST CONCRETE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H20 LOADING. GRATES, LIDS AND FRAMES SHALL BE DESIGNED TO WITHSTAND H20 TRAFFIC LOADING.
7. EPOXIES
   - 7.1. WATER-INSENSITIVE TWO-PART TYPE EPOXY ADHESIVE MATERIAL CONTAINING 100 PERCENT SOLIDS, MEETING THE REQUIREMENTS OF CALTRANS STANDARD 95.
8. BASE AND SUBBASE
   - 8.1. CLASS 2 AGGREGATE BASE, ¾-INCH MAXIMUM, PER CALTRANS SECTION 26.
9. ASPHALT PAVING AND SEALS
   - 9.1. ASPHALT CONCRETE SHALL BE TYPE A HOT MIX ASPHALT, ¾" AGGREGATE GRADATION, PER SECTION 39.2.02 OF THE CALTRANS STANDARD SPECIFICATIONS.
   - 9.2. PAINT BINDER (TACK COAT) AND PRIME COAT SHALL BE TYPE RS1 ASPHALTIC EMULSION PER SECTION 94 OF THE CALTRANS STANDARD SPECIFICATIONS.
10. POLYVINYL CHLORIDE (PVC) PIPE.
    - 10.1. POLYVINYL CHLORIDE (PVC) PIPE SHALL BE PRESSURE CLASS 235, DIMENSION RATION 18 PER AWWA STANDARD C900.
    - 10.2. INSTALL PVC PIPE PER AWWA STANDARD C605.
    - 10.3. PROVIDE A LOCATOR WIRE FOR ALL PVC PIPE.
    - 10.4. PVC WATER MAINS SHALL BE RESTRAINED USING THRUST BLOCKS OR MECHANICAL JOINT RESTRAINTS. MECHANICAL JOINT RESTRAINTS SHALL BE MEGALUG BY EBAA IRON, INC.
    - 10.5. DISINFECT INSTALLED PIPE USING SODIUM HYPOCHLORITE SOLUTION PER AWWA STANDARD C651.
    - 10.6. PRESSURE TEST INSTALLED PIPE TO 150 PSI PER AWWA STANDARD C605.
11. DUCTILE IRON PIPE
    - 11.1. DUCTILE IRON PIPE SHALL BE PER AWWA STANDARD C151, PRESSURE CLASS 350.
    - 11.2. ABOVE-GRADE PIPE SHALL BE CEMENT-MORTAR LINED AND EPOXY-COATED.
    - 11.3. BURIED PIPE SHALL BE CEMENT-MORTAR LINED AND BITUMINOUS COATED.
    - 11.4. INSTALL PER AWWA STANDARD C600. PRESSURE TEST INSTALLED PIPE TO 150 PSI.
12. DUCTILE IRON FITTINGS.
    - 12.1. DUCTILE IRON FITTINGS SHALL BE PER AWWA STANDARD C110.
    - 12.2. DUCTILE IRON FITTINGS SHALL BE CEMENT MORTAR LINED AND EPOXY-COATED.
    - 12.3. GASKETS SHALL BE VULCANIZED BUTADIENE RUBBER (SBR).
    - 12.4. BOLTS AND NUTS SHALL BE TYPE 316 STAINLESS STEEL CONFORMING TO ASTM F593.
13. TAPPING SLEEVES
    - 13.1. CONNECTIONS TO EXISTING WATER MAINS 6-INCH AND LARGER SHALL BE BY HOT TAPPING.
    - 13.2. TAPPING SLEEVES SHALL BE FULL-CIRCLE STAINLESS STEEL SLEEVES PER AWWA STANDARD A223, MUELLER MODEL H-304, JCM MODEL 432 OR EQUAL.
    - 13.3. TAPPING SLEEVE SHALL HAVE FLANGED FITTING ON THE TEE.
    - 13.4. POTHOLE TO VERIFY EXISTING PIPELINE SIZE AND MATERIAL BEFORE PURCHASING TAPPING SADDLES.
14. GATE VALVES
    - 14.1. RESILIENT WEDGE GATE VALVES PER AWWA C509, U.L.LISTED, CLOW MODEL 2639 OR EQUAL.
    - 14.2. BURIED VALVES SHALL HAVE 2-INCH SQUARE OPERATING NUT. ABOVE GRADE VALVES SHALL HAVE OPEN STEM AND YOKE (OS&Y) UNLESS NOTED OTHERWISE.
    - 14.3. INTERIOR AND EXTERIOR METAL SURFACES SHALL BE FACTORY-COATED WITH EPOXY MEETING NSF 61.
    - 14.4. END CONNECTIONS AS INDICATED ON THE DRAWINGS.
    - 14.5. BOLTS AND NUTS SHALL BE TYPE 316 STAINLESS STEEL.
    - 14.6. VALVE BOXES SHALL BE TRAFFIC-RATED PRE-CAST CONCRETE WITH IRON LID, CHRISTY MODEL G05T OR EQUAL.
15. PIPE EXPANSION JOINT
    - 15.1. DOUBLE-BALL FLEXIBLE EXPANSION JOINT, CAPABLE OF RELIEVING BOTH LATERAL AND LONGITUDINAL MOVEMENTS, EBAA FLEX-TEND SERIES OR APPROVED EQUAL.
16. DISMANTLING JOINT
    - 16.1. TELESCOPING FLANGED PIPE FITTING DESIGNED FOR WORKING PRESSURES UP TO 200 PSIG, ROMAC SERIES DJ400 OR EQUAL.
17. FLANGED COUPLING ADAPTER
    - 17.1. TELESCOPING FLANGE BY MECHANICAL JOINT FITTING, DESIGNED FOR WORKING PRESSURES UP TO 200 PSIG, ROMAC SERIES RFCA OR EQUAL.
18. CHECK VALVE
    - 18.1. CHECK VALVE SHALL BE GLOBE-TYPE WITH ANSI CLASS 250 FLANGES, FACTORY MUTUAL APPROVED FOR FIRE SERVICE.
    - 18.2. CLA-VAL SERIES 581, VAL-MATIC SERIES 1800, OR EQUAL.
19. COMBINATION AIR VALVE
    - 19.1. COMBINATION AIR RELEASE AND VACUUM BREAKER VALVE, SUITABLE FOR POTABLE WATER SERVICE, PER AWWA STANDARD C512.
    - 19.2. APCO SERIES 140C, VAL-MATIC SERIES 201-C, OR EQUAL.
20. BALL VALVES
    - 20.1. THREADED END BALL VALVES, 1 INCH AND SMALLER, FULL PORT BALL TYPE WITH LEVER OPERATOR, RATED FOR 150 PSI SERVICE.
    - 20.2. VALVES SHALL HAVE STAINLESS STEEL BALL AND BODY. SEALS AND STEM SHALL BE NSF 61 COMPLIANT.
21. LOCATOR WIRE
    - 21.1. LOCATOR WIRE SHALL BE 10-GAUGE STRANDED COPPER WIRE.
    - 21.2. WIRE SHALL BE PLACED CONTINUOUSLY ON TOP OF INSTALLED PIPE AND BROUGHT TO THE SURFACE AT EACH VALVE. ATTACHED WIRE TO PIPE USING PLASTIC ADHESIVE TAPE AT 10-FT INTERVALS.
    - 21.3. WIRE SHALL BE BROUGHT UP THE OUTSIDE OF THE VALVE RISER AND FOLDED OVER BETWEEN THE INSIDE OF THE VALVE BOX AND THE VALVE RISER. WIRE SHALL BE BROUGHT TO WITHIN 6-INCHES OF FINISHED GRADE.
22. BACKFLOW PREVENTION VALVE
    - 22.1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY PER AWWA STANDARD C511.
    - 22.2. ASSEMBLY SHALL INCLUDE ISOLATING GATE VALVES.
    - 22.3. VALVE SHALL BE LEAD-FREE, FEBCO MODEL LF825Y, ZURN-WILKINS MODEL 975XL OR EQUAL.
    - 22.4. INSTALL BACKFLOW PREVENTION VALVE MINIMUM 12-INCHES ABOVE FINISHED GRADE.
23. CHAIN LINK FENCES AND GATES
    - 23.1. CHAIN LINK FENCES AND GATES SHALL BE PER CALTRANS STANDARD 80-3.
    - 23.2. FABRIC SHALL BE GALVANIZED STEEL WIRE, WITH KNUCKLED TOP AND TWISTED BOTTOM SELVAGES.
    - 23.3. FENCE SHALL HAVE TOP RAIL AND BOTTOM TENSION WIRE.
    - 23.4. FENCE POSTS, BRACES AND RAILS SHALL BE SCHEDULE 40 GALVANIZED STEEL PIPE. LINE POSTS SHALL BE 2.5 INCHES IN DIAMETER. CORNER AND END POSTS SHALL BE 3 INCHES IN DIAMETER. GATE POSTS SHALL BE A MINIMUM OF 6 INCHES IN DIAMETER. BRACES AND TOP RAILS SHALL BE 1.67 INCHES IN DIAMETER. POSTS SHALL HAVE GALVANIZED CAPS TO EXCLUDE MOISTURE. TRUSS RODS SHALL BE $\frac{3}{8}$ INCH DIAMETER GALVANIZED STEEL. TURN-BUCKLES, TENSION WIRES, TIE WIRES AND HOG RINGS SHALL CONFORM TO CALTRANS STANDARD 80-3.
    - 23.5. ALL POSTS AND HARDWARE SHALL BE HOT DIP GALVANIZED.
    - 23.6. BARBED WIRE SHALL BE 12.5 GAUGE WIRE WITH 4-POINT ROUND BARBS, PER ASTM A121, CLASS 3.
    - 23.7. GATES SHALL BE OF THE SAME HEIGHT AS THE ADJACENT FENCE. GATES SHALL BE PROVIDED WITH ALL NECESSARY HARDWARE, INCLUDING HINGES, LATCHES AND STOPS.
    - 23.8. SWINGING GATE PANELS SHALL BE CROSS-TRUSSED WITH $\frac{3}{8}$ INCH DIAMETER TRUSS RODS AND TURNBUCKLES. GATES SHALL BE HINGED TO OPEN 180-DEGREES. GATE SHALL BE FURNISHED WITH A A KEEPER AND PLUNGER-BAR TYPE LATCH WITH PROVISION FOR A PADLOCK. THE PLUNGER BAR SHALL DROP INTO A BURIED CENTER STOP WHEN THE GATE IS CLOSED.
24. PRESSURE TRANSDUCER
    - 24.1. PROVIDE PRESSURE TRANSDUCERS WITH RANGE AND LOCATION AS INDICATED ON THE DRAWINGS.
    - 24.2. PRESSURE TRANSDUCER SHALL BE MADE OF 316 STAINLESS STEEL.
    - 24.3. TRANSDUCER ACCURACY SHALL BE ± 1.0% WITH HYSTERESIS AND REPEATABILITY OF NO GREATER THAN 1% FULL SCALE.
    - 24.4. OUTPUT SIGNAL SHALL BE 4-20 mA WITH A SUPPLY VOLTAGE RANGE OF 9-32 VDC.
25. PRESSURE GAUGES
    - 25.1. BOURDON TUBE PRESSURE GAUGE, 2.5 INCH DIAMETER FACE, RANGE AND INSTALLATION LOCATION AS SHOWN ON DRAWINGS.
    - 25.2. GAUGE SHALL BE LIQUID-FILLED, WITH COPPER-ALLOY INTERNAL PARTS IN A STAINLESS STEEL CASE.
    - 25.3. GAUGE ACCURACY SHALL BE ± 2.5 %.
    - 25.4. GAUGE SHALL BE CAPABLE OF EXPERIENCING A PRESSURE 30% ABOVE ITS MAXIMUM SPAN WITHOUT REQUIRING RECALIBRATION.
26. PRESSURE SWITCH
    - 26.1. PROVIDE PUMP CONTROL PRESSURE SWITCH, DPST, WITH ADJUSTABLE SET POINTS, CLOSE ON FALLING PRESSURE AND OPEN ON RISING PRESSURE.
    - 26.2. REQUIRED OPERATING RANGE:
      - 26.2.1. LEWIS TANKS: 0 TO 18.75 FEET (0 TO 8.12 PSIG), OPERATING DIFFERENTIAL 1 TO 2 PSIG.
      - 26.2.2. KASKI TANKS: 0 TO 17.75 FEET (0 TO 7.68 PSIG), OPERATING DIFFERENTIAL 1 TO 2 PSIG.
      - 26.2.3. MADRONE TANKS: 0 TO 18.75 FEET (0 TO 8.12 PSIG), OPERATING DIFFERENTIAL 1 TO 2 PSIG.
    - 26.3. CONNECTION SHALL BE $\frac{1}{4}$ INCH FNPS.
    - 26.4. ALL WETTED PARTS SHALL BE STAINLESS STEEL OR NSF 61 COMPLIANT.
    - 26.5. SQUARE-D PUMPTROL, SERIES 9013FS OR EQUAL.
27. PIPE SUPPORTS
    - 27.1. PROVIDE PREFORMED CHANNEL PIPE SUPPORTS (PIPE STANDS) AS SHOWN ON THE DRAWINGS.
    - 27.2. PIPE SUPPORTS SHALL BE OF MANUFACTURER'S STANDARD DESIGN. MATERIAL SHALL BE GALVANIZED STEEL.
    - 27.3. ANCHOR THE SUPPORT INTO THE FOUNDATION SLAB PER THE MANUFACTURER'S RECOMMENDATION.
28. CONDUIT
    - 28.1. PVC CONDUIT SHALL CONFORM TO UL 651.
29. CONDUCTORS (WIRES)
    - 29.1. SIGNAL WIRE
    - 29.2. POWER WIRE
30. MIXING SYSTEM
    - 30.1. TANK MIXING SYSTEM SHALL BE GRIDBEE GS-9 BY MEDORA CORP, OR EQUAL, EQUIPPED WITH THE FOLLOWING ACCESSORIES:
      - 30.1.1. $\frac{1}{2}$" DIAMETER CHLORINE BOOSTING LINE
      - 30.1.2. CHLORINE BOOST SYSTEM WITH THE FOLLOWING:
        - 30.1.2.1. AN AIR OPERATED DOUBLE DIAPHRAGM PUMP WITH DISCHARGE RATE OF 0 TO 4 GPM.
        - 30.1.2.2. 20 GALLON CHLORINE HOLDING TANK AND 5 GALLON RINSE WATER HOLDING TANK
        - 30.1.2.3. 316 STAINLESS STEEL BASE AND SKID FRAME WITH SECONDARY CONTAINMENT BUILT IN.
        - 30.1.2.4. FLOW INDICATOR AND REGULATING VALVE.
        - 30.1.2.5. ALL COMPONENTS RATED FOR CONTACT WITH 12.5% SODIUM HYPOCHLORITE SOLUTION.
      - 30.1.3. LOW ELEVATION INTAKE
      - 30.1.4. RESTRAINT SYSTEM
      - 30.1.5. AN ELECTRIC CONTROL BOX INCLUDING MOTOR CURRENT INDICATOR IN A 4-20mA ANALOG OUTPUT AND REMOTE ON/OFF CONTROL VIA 24VDC RELAY
31. DUCKBILL CHECK VALVES
    - 31.1. DUCKBILL CHECK VALVES SHALL BE TIDEFLEX SERIES 35 OR EQUAL
32. FLAP CHECK VALVES
    - 32.1. FLAP CHECK VALVES SHALL BE WATERFLEX SERIES W-3 BY TIDEFLEX TECHNOLOGIES
33. TEMPORARY WATER TANKS
    - 33.1. TEMPORARY WATER TANKS SHALL BE NORWESCO 10,000 GALLON VERTICAL TANKS OR EQUAL.

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER · ANDREW A. STERBENZ · No. 69735 · CIVIL · STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

MATERIALS SPECIFICATIONS

LOMPICO TANKS REPLACEMENT

SLVWD NO.________

San Lorenzo Valley WATER DISTRICT

DESIGNED BY: CJM	DATE: 05/29/2019
DRAWN BY: CJM	DATE: 05/29/2019
QC CHECKED BY: AAS	DATE: 05/29/2019
PROJECT NO.:	
SCALE: NO SCALE	
SUBMITTAL: 60% SUBMITTAL	

STEEL WATER TANK SPECIFICATIONS:

1. **GENERAL**

1.1. PROVIDE A STEEL POTABLE WATER STORAGE TANK, AS SHOWN ON THE PLANS AND SPECIFIED HEREIN. TANK SHALL BE BOLTED STEEL PER AWWA STANDARD D103. TANK SHALL MEET THE REQUIREMENTS OF TITLE 22, DIVISION 4, CHAPTER 16, ARTICLE 6, SECTION 64585 OF THE CALIFORNIA CODE OF REGULATIONS.

1.2. SUBMITTALS

1.2.1. SHOP DRAWINGS OF TANK AND ACCESSORIES, SHOWING ALL DIMENSIONS AND REQUIRED THICKNESSES.

1.2.2. DESIGN CALCULATIONS, SIGNED BY A CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA.

1.2.3. VENT SIZING CALCULATIONS.

1.2.4. FABRICATION AND ERECTION DRAWINGS AND DETAILS FOR THE RESERVOIR AND ALL ACCESSORIES.

1.2.5. CERTIFIED MILL TESTS ON STEEL PLATE AND STRUCTURAL MEMBERS DEMONSTRATING THAT THE PHYSICAL AND CHEMICAL REQUIREMENTS OF THIS SPECIFICATION HAVE BEEN MET.

1.2.6. CERTIFIED TEST DATA ON THE COATING THICKNESS.

1.2.7. TANK TESTING AND DISINFECTION SCHEDULE.

1.3. QUALIFICATIONS

1.3.1. TANK MANUFACTURER SHALL BE A SPECIALIST IN THE DESIGN OF WELDED STEEL OR BOLTED STEEL TANKS CONFORMING TO THE REQUIREMENTS OF THIS SPECIFICATION. SUPPLIER SHALL HAVE A MINIMUM OF TEN (10) YEARS OF DOCUMENTED EXPERIENCE MANUFACTURING AND INSTALLING STEEL TANKS FOR WATER STORAGE.

1.4. REFERENCES

1.4.1. AMERICAN SOCIETY FOR CIVIL ENGINEERS (ASCE):

1.4.1.1. 7 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

1.4.2. AMERICAN WATER WORKS ASSOCIATION (AWWA):

1.4.2.1. D103-09 - FACTORY-COATED BOLTED STEEL TANKS FOR WATER STORAGE.

1.4.3. CALIFORNIA BUILDING CODE (CBC), 2019 EDITION

1.4.4. CALIFORNIA STATE DEPARTMENT OF INDUSTRIAL RELATIONS DIVISION OF OCCUPATIONAL SAFETY AND HEALTH (CAL/OSHA)

1.4.5. FM GLOBAL (FACTORY MUTUAL)

1.4.5.1. CLASS NUMBER 4020 - APPROVAL STANDARD FOR STEEL TANKS FOR FIRE PROTECTION

1.4.6. NSF INTERNATIONAL

1.4.6.1. NSF/ANSI 61 - DRINKING WATER SYSTEM COMPONENTS

1.4.7. SOCIETY FOR PROTECTIVE COATINGS (SSPC)

1.5. DESIGN DATA. THE FOLLOWING DATA AND INFORMATION ARE SUPPLIED AS A BASIS FOR DESIGN AND ERECTION OF THE TANK AND APPURTENANCES:

1.5.1. TANK CAPACITY & DIMENSIONS

1.5.1.1. LEWIS TANKS (PER TANK)

1.5.1.1.1.	NOMINAL CAPACITY	114,300 GAL
1.5.1.1.2.	USABLE CAPACITY	88,730 GAL
1.5.1.1.3.	INSIDE DIAMETER	32'
1.5.1.1.4.	TANK HEIGHT	25'
1.5.1.1.5.	REQUIRED FREEBOARD	4.88'

1.5.1.1. KASKI TANKS (PER TANK)

1.5.1.1.1.	NOMINAL CAPACITY	42,300 GAL
1.5.1.1.2.	USABLE CAPACITY	32,310 GAL
1.5.1.1.3.	INSIDE DIAMETER	20'
1.5.1.1.4.	TANK HEIGHT	23'
1.5.1.1.5.	REQUIRED FREEBOARD	4.09'

1.5.1.1. MADRONE TANKS (PER TANK)

1.5.1.1.1.	NOMINAL CAPACITY	75,460 GAL
1.5.1.1.2.	USABLE CAPACITY	58,580 GAL
1.5.1.1.3.	INSIDE DIAMETER	26'
1.5.1.1.4.	TANK HEIGHT	25'
1.5.1.1.5.	REQUIRED FREEBOARD	4.90'

1.5.2. SEISMIC DESIGN CRITERIA

1.5.2.1. LEWIS TANKS

1.5.2.1.1.	SEISMIC USE GROUP	III
1.5.2.1.2.	SEISMIC IMPORTANCE FACTOR, IE	1.50
1.5.2.1.3.	SITE CLASS	D
1.5.2.1.4.	SS	1.50 g
1.5.2.1.5.	S1	0.67 g
1.5.2.1.6.	Fa	1.00
1.5.2.1.7.	FV	1.50

1.5.2.1. KASKI TANKS

1.5.2.1.1.	SEISMIC USE GROUP	III
1.5.2.1.2.	SEISMIC IMPORTANCE FACTOR, IE	1.50
1.5.2.1.3.	SITE CLASS	D
1.5.2.1.4.	SS	1.54 g
1.5.2.1.5.	S1	0.70 g
1.5.2.1.6.	Fa	1.00
1.5.2.1.7.	FV	1.50

1.5.2.1. MADRONE TANKS

1.5.2.1.1.	SEISMIC USE GROUP	III
1.5.2.1.2.	SEISMIC IMPORTANCE FACTOR, IE	1.50
1.5.2.1.3.	SITE CLASS	D
1.5.2.1.4.	SS	1.62 g
1.5.2.1.5.	S1	0.74 g
1.5.2.1.6.	Fa	1.00
1.5.2.1.7.	FV	1.50

1.5.3. DESIGN WIND LOADING

1.5.3.1.	DESIGN WIND SPEED, V	115 MPH
1.5.3.2.	GUST FACTOR, G	1.0
1.5.3.3.	IMPORTANCE FACTOR, I	1.15
1.5.3.4.	EXPOSURE CATEGORY	C

1.5.4. ROOF DESIGN LOADING

1.5.4.1.	ROOF LIVE LOAD	25 PSF
1.5.4.2.	GROUND SNOW LOAD	NONE
1.5.5.	LIQUID TO BE STORED	POTABLE WATER
1.5.6.	ALLOWABLE SOIL BEARING PRESSURE	2,000 PSF

1.6. FOUNDATION

1.6.1. TANK FOUNDATION TO BE CONCRETE RINGWALL FOUNDATION PER AWWA D103 SECTION 13.4.1, AS APPLICABLE. MANUFACTURER'S ENGINEER TO DESIGN FOUNDATION PER FINAL TANK DIMENSIONS AND RECOMMENDATIONS OF THE SOILS REPORT.

1.7. ACCESSORIES

1.7.1. SHELL MANHOLES: PROVIDE TWO (2) 30 INCH, MINIMUM, HINGED SHELL MANHOLES LOCATED AS SHOWN ON THE DRAWINGS. THE CENTER OF THE MANHOLE SHALL BE LOCATED 30 INCHES ABOVE THE BOTTOM OF THE TANK.

1.7.2. PIPE CONNECTIONS:

1.7.2.1. PROVIDE INLET NOZZLE, OUTLET NOZZLE WITH ANTIVORTEX PLATE, AND OVERFLOW AND DRAIN OUTLETS AS SHOWN ON THE PLANS.

1.7.2.2. PROVIDE A 1-INCH NPT TANK CONNECTION AS SHOWN ON THE PLANS FOR SAMPLING CONNECTION.

1.7.2.3. OVERFLOW PIPE: PROVIDE STEEL INTERNAL OR EXTERNAL OVERFLOW PIPE, INTERNAL WEIR BOX, IF REQUIRED, AND PIPE SUPPORTS. OVERFLOW PIPE SHALL BE DESIGNED FOR A TANK FILL RATE OF 750 GPM. OVERFLOW OUTLET SHALL HAVE A WATERMAN PF-25 CHECK FLAP VALVE AND #24 MESH STAINLESS STEEL SCREEN.

1.7.2.4. PIPES SHALL BE EPOXY LINED AND COATED, MATCHING THE TANK COATING METHOD.

1.7.3. LADDERS:

1.7.3.1. PROVIDE A GALVANIZED STEEL WELDED EXTERIOR LADDER WITH BACKGUARD CAGE AND SAFE-T-CLIMB ASSEMBLY AS SHOWN ON THE PLANS. THE LADDER SHALL HAVE LOCKABLE CLOSURES AT THE BOTTOM OF CAGE AND ACROSS THE UNCAGED PORTION OF THE LADDER.

1.7.3.2. PROVIDE A GALVANIZED STEEL WELDED INTERIOR LADDER.

1.7.4. ROOF OPENINGS:

1.7.4.1. PROVIDE A CIRCULAR-SHAPED ROOF VENT. THE VENT SHALL BE SIZED SO THAT 2,500 GPM PUMPING RATE DOES NOT PRODUCE A DIFFERENTIAL PRESSURE BEYOND WHICH THE TANK IS DESIGNED. AN EFFECTIVE AREA OF 75% OF SCREEN OPENING SHALL BE ASSUMED. THE VENT SHALL BE PROTECTED WITH A #24 MESH STAINLESS STEEL SCREEN. VENT SHALL HAVE REMOVABLE COVER. HARDWARE SHALL BE TYPE 316 STAINLESS STEEL.

1.7.4.2. PROVIDE A CURBED, UPWARD OPENING MANWAY HATCH LOCATED NEAR THE LADDER, NOMINAL 36-INCHES SQUARE. THE CURB SHELL EXTEND AT LEAST 4 INCHES ABOVE THE TANK. THE HATCH COVER SHALL BE HINGED AND SHALL HAVE LOCKING PROVISIONS. THE HATCH COVER LIP SHALL EXTEND FOR A DISTANCE OF 2-INCHES DOWN ON THE OUTSIDE OF THE CURB. PROVIDE NSF 61 COMPLIANT RUBBER GASKET SEALANT WHERE THE HATCH COVER CONTACTS THE HATCH OPENING.

1.7.5. PROVIDE A HOT-DIPPED GALVANIZED STEEL PIPE RAILING ON THE ROOF AS SHOWN ON THE DRAWINGS.

1.7.6. PROVIDE A LIQUID LEVEL INDICATOR COMPLETE WITH FLOAT AND TARGET BOARD ASSEMBLY. MATERIALS INSIDE THE TANK SHALL BE TYPE 316 STAINLESS STEEL.

1.7.7. GASKETS AND SEALANTS SHALL MEET OR EXCEED AWWA, NSF AND EPA STANDARDS FOR POTABLE WATER.

1.7.8. ANCHOR BOLTS AND STIRRUPS, IF REQUIRED, TO BE FURNISHED BY THE TANK MANUFACTURER.

1.8. TESTING AND DISINFECTION

1.8.1. A TESTING AND DISINFECTION SCHEDULE, INCLUDING PROPOSED PLANS FOR WATER CONVEYANCE, CONTROL, DISINFECTION, AND DISPOSAL SHALL BE SUBMITTED IN WRITING FOR APPROVAL A MINIMUM OF 14 DAYS BEFORE TESTING IS TO COMMENCE. THE SUBMITTAL SHALL INCLUDE CONTRACTOR'S PLAN FOR THE RELEASE OF WATER FROM STRUCTURES AFTER TESTING AND DISINFECTION HAS BEEN COMPLETED.

1.8.2. AFTER CONSTRUCTION IS COMPLETED AND PRIOR TO TESTING, THE INTERIOR OF THE RESERVOIR SHALL BE COMPLETELY HOSED OUT AND CLEANED OF ALL DIRT AND LOOSE MATERIAL. ALL WATER, DIRT, AND FOREIGN MATERIAL ACCUMULATED IN THIS CLEANING OPERATION SHALL BE DISCHARGED FROM THE RESERVOIR OR OTHERWISE REMOVED.

1.8.3. TANK SHALL BE LEAK TESTED IN ACCORDANCE WITH AWWA D103 SECTION 11.2, AS APPLICABLE.

1.8.4. AFTER COMPLETION OF THE INTERIOR COATINGS, PROPER CURING PROCEDURES SHALL BE FOLLOWED. ADEQUATE CURE TIME SHALL BE ALLOWED PRIOR TO PERFORMING DISINFECTION AND LEAK TESTING.

1.8.5. TANK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C652-11 (DISINFECTION OF WATER STORAGE FACILITIES). PIPING SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C651-14.

1.8.6. DISINFECTION SHALL USE HYPOCHLORITE SOLUTION PER AWWA B300. COMPLIANCE WITH NSF/ANSI 60, DRINKING WATER TREATMENT CHEMICALS IS REQUIRED.

1.8.7. LEAK TESTING AND DISINFECTING OF THE RESERVOIR SHALL BE A COMBINED OPERATION. DISINFECTION SHALL BE ACCOMPLISHED BY CHLORINATION. ALL CHLORINATING AND TESTING OPERATIONS SHALL BE DONE IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER. DISINFECTION OPERATIONS SHALL BE SCHEDULED BY THE CONTRACTOR AS LATE AS POSSIBLE DURING THE CONTRACT TIME PERIOD SO AS TO ASSURE THE MAXIMUM DEGREE OF STERILITY OF THE FACILITIES AT THE TIME THE WORK IS ACCEPTED BY THE OWNER.

1.8.8. DISINFECTED WATER STORAGE FACILITIES SHALL BE SAMPLED AND TESTED BY THE OWNER IN ACCORDANCE WITH ANSI/AWWA C652. BACTERIOLOGICAL AND VOLATILE ORGANIC COMPOUND (VOC) TESTING WILL BE PERFORMED BY A CERTIFIED TESTING LABORATORY APPOINTED AND PAID FOR BY THE OWNER. RESULTS OF THE TESTING SHALL BE SATISFACTORY TO THE CALIFORNIA STATE WATER RESOURCES CONTROL BOARD'S DIVISION OF DRINKING WATER (DDW) AND THE OWNER. THE NEW FACILITIES SHALL REMAIN ISOLATED AND OUT OF SERVICE UNTIL SATISFACTORY TEST RESULTS HAVE BEEN OBTAINED WHICH MEET THE REQUIREMENTS OF DDW AND THE OWNER. IF UNSATISFACTORY OR DOUBTFUL RESULTS ARE OBTAINED FROM THE INITIAL SAMPLING, CONTRACTOR SHALL REPEAT THE DISINFECTION PROCESS UNTIL ACCEPTABLE TEST RESULTS ARE REPORTED. THE FOLLOW-UP SAMPLING COSTS SHALL BE BORNE BY THE CONTRACTOR.

1.8.9. AFTER DISINFECTION, THE TANK SHALL BE DRAINED AND REFILLED TO THE OVERFLOW LEVEL AND ALLOWED TO STAND FOR 5 DAYS, MINIMUM. AFTER 5 DAYS, THE OWNER SHALL TAKE WATER SPECIMENS FOR V.O.C. TEST PER EPA 502.2. THE TANK MAY BE PLACED INTO SERVICE ONCE ACCEPTABLE TEST RESULTS ARE RECEIVED.

1.8.10. IF VOC LEVELS EXCEED DRINKING WATER STANDARDS, CONTRACTOR SHALL PREPARE A VOC REMOVAL PLAN, AT THE CONTRACTOR'S EXPENSE, FOR THE OWNER APPROVAL.

1.8.11. SUFFICIENT WATER WILL BE PROVIDED FREE OF CHARGE BY THE OWNER FOR ONE FILLING OF THE RESERVOIR TO BE USED FOR DISINFECTION AND TESTING, AND TESTING OF ALL VALVES AND PIPING. HOWEVER, THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS FOR CONVEYING THE WATER FROM THE OWNER-DESIGNATED SOURCE TO THE POINTS OF USE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A BACKFLOW DEVICE FOR CONNECTION TO THE EXISTING SYSTEM.

1.8.12. ALL WATER USED IN RETESTING THE RESERVOIR SHALL BE DISPOSED OF BY THE CONTRACTOR AT HIS SOLE EXPENSE. WATER MAY BE DISCHARGED INTO STORM DRAINS WHERE WRITTEN PERMISSION IS GIVEN BY THE GOVERNMENTAL AGENCY HAVING JURISDICTION. CONTRACTOR SHALL APPLY A REDUCING AGENT TO THE SOLUTION TO NEUTRALIZE RESIDUAL CHLORINE REMAINING IN THE WATER. THE DISPOSAL OF WATER SHALL, IN ALL CASES, BE CARRIED OUT IN STRICT OBSERVANCE OF THE WATER POLLUTION CONTROL REQUIREMENTS OF THE CALIFORNIA STATE REGIONAL WATER QUALITY CONTROL BOARD. THE FLOW OF WATER FROM THE TANK SHALL BE CONTROLLED TO PREVENT EROSION OF SURROUNDING SOIL, DAMAGE TO VEGETATION, AND ALTERING OF ECOLOGICAL CONDITIONS IN THE AREA.

1.8.13. RELEASE OF WATER FROM STRUCTURES, AFTER TESTING AND DISINFECTION HAVE BEEN COMPLETED, SHALL ONLY BE DONE WITH APPROVAL FROM THE OWNER.

1.8.14. ANY WATER USED FOR TESTING OR DISINFECTING, REQUIRED TO BE REMOVED FROM THE TANK AT THE DIRECTION OF THE OWNER, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WHO SHALL FURNISH THE NECESSARY LABOR, TOOLS AND EQUIPMENT, INCLUDING PUMPS, WITHOUT ADDITIONAL COMPENSATION.

2. **BOLTED STEEL TANK**

2.1. PROVIDE FACTORY COATED BOLTED CARBON STEEL TANK COMPLETE WITH CONCRETE RINGWALL FOUNDATION AND ALL PIPE CONNECTIONS, ACCESSORIES AND APPURTENANCES AS SHOWN ON THE PLANS AND AS REQUIRED BY APPLICABLE STANDARDS REFERENCED HEREIN. BOLTED STEEL TANK SHALL CONFORM TO THE REQUIREMENTS OF AWWA D103-09, STANDARD FOR FACTORY-COATED BOLTED CARBON STEEL TANKS FOR WATER STORAGE.

2.2. THE MANUFACTURER SHALL FURNISH, ERECT AND TEST THE TANK, AS REQUIRED BY AWWA D103. THE MANUFACTURER SHALL BE COMPLETELY RESPONSIBLE FOR THE CONSTRUCTION AND SATISFACTORY PERFORMANCE OF THE TANK DURING THE GUARANTEE PERIOD. THE TANK SHALL CONFORM TO AWWA D103 TO THE LATEST EDITION BUILDING CODE, AND TO THE REQUIREMENTS OF THE PLANS AND THESE SPECIFICATIONS.

2.3. MATERIALS

2.3.1. PLATES AND SHEETS. PLATES AND SHEETS SHALL CONFORM TO APPROPRIATE ASTM DESIGNATION AS SET FORTH IN SECTION 4.4, AWWA D103-09, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 30,000 PSI.

2.3.2. STRUCTURAL SHAPES. STRUCTURAL SHAPES SHALL CONFORM TO THE REQUIREMENTS AND ASTM DESIGNATIONS OF AWWA D103-09 SECTION 4.5

2.3.3. BOLTS. TANK JOINT BOLTING SHALL BE MINIMUM ½ DIAMETER, SHALL MEET THE REQUIREMENTS OF AWWA D103-09 SECTION 4.2.1. AND HAVE TENSILE STRENGTH OF AT LEAST 120,000 POUNDS PER SQUARE INCH.

2.3.4. GASKETS AND SEALANT. ALL GASKETS AND SEALANTS USED ON THIS TANK SHALL CONFORM TO THE REQUIREMENTS OF AWWA D103-09 SECTION 4.10.

2.4. PROTECTIVE COATING

2.4.1. GENERAL: ALL METAL PLATES, SUPPORTS, MEMBERS AND MISCELLANEOUS PARTS, EXCEPT BOLTS, SHALL BE FACTORY COATED IN ACCORDANCE WITH AWWA D103, SECTION 12.6 AND THIS SECTION. FIELD COATING, OTHER THAN TOUCH-UP, WILL NOT BE PERMITTED.

2.4.2. SURFACE PREPARATION:

2.4.2.1. ALL STEEL SURFACES SHALL BE SHOT BLASTED TO EQUIVALENT OF A SP 10 OR BETTER NEAR WHITE METAL FINISH. THE SURFACE ANCHOR PATTERN SHALL BE NO LESS THAN 1.5 MILS.

2.4.2.2. SPRAY A FINAL DEIONIZED WATER RINSE WITH SILICA-ZIRCONIUM (SI-ZR) SEALER TO PREVENT RUSTING PRIOR TO THE POWDER COATING APPLICATION AND PROVIDE ADDITIONAL LEVEL OF CORROSION PROTECTION

2.4.2.3. ALL STEEL SURFACES SHALL DRIP DRY FOR SEVEN (7) MINUTES PRIOR TO ENTERING THE DRY OFF OVEN FOR EIGHT (8) MINUTES AT 425 DEGREES F.

2.4.3. COATING:

2.4.3.1. ALL INTERIOR STEEL SURFACES, SUPPORT MEMBERS AND MISCELLANEOUS PARTS SHALL RECEIVE 5 MILS MINIMUM AVERAGE DRY FILM THICKNESS USING AN NSF 61 APPROVED, THERMAL SET EPOXY POWDER COATING.

2.4.3.2. ALL EXTERIOR STEEL SURFACES, SUPPORT MEMBERS AND MISCELLANEOUS PARTS SHALL RECEIVE MINIMUM 2 MILS AVERAGE DRY FILM THICKNESS TANK TAN PRIMER UNDER 3 MILS MINIMUM AVERAGE DRY FILM THICKNESS USING A THERMAL SET TGIC-POLYESTER POWDER COATING, FOR A TOTAL OF 5 MILS.

2.5. FIELD ERECTION OF FACTORY COATED BOLTED STEEL TANKS SHALL BE IN STRICT COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS AND PERFORMED BY MANUFACTURER'S EMPLOYEES OR CERTIFIED ERECTION CREW TO ALLEVIATE ANY POTENTIAL DISPUTES IN COATING QUALITY OR ERECTION THEREOF. PARTICULAR CARE SHALL BE EXERCISED IN HANDLING AND BOLTING OF THE TANK PLATES, SUPPORTS, AND MEMBERS TO AVOID ABRASION OR SCRATCHING THE COATING. PRIOR TO PLACING WATER IN THE TANK, A "HOLIDAY" INSPECTION OF THE ENTIRE TANK, CORNERS INCLUDED, WILL BE PROVIDED AND PERFORMED BY THE MANUFACTURER IN THE PRESENCE OF THE OWNER. TOUCH-UP COATING SHALL BE DONE

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

STEEL WATER TANK SPECIFICATIONS

LOMPICO TANKS REPLACEMENT

SLVWD NO. ______

San Lorenzo Valley WATER DISTRICT

DESIGNED BY: CJM DATE: 05/29/2019
DRAWN BY: CJM DATE: 05/29/2019
QC CHECKED BY: AAS DATE: 05/29/2019
PROJECT NO.:
SCALE: NO SCALE
SUBMITTAL: 60% SUBMITTAL

G1.4

SHEET 5 OF 25

PER THE MANUFACTURER'S RECOMMENDATIONS WHERE NEEDED AND AS DIRECTED TO ACHIEVE 100% HOLIDAY-FREE SURFACE.

2.6. TESTING AND INSPECTION

2.6.1. GENERAL: TEST STORAGE TANK AFTER ERECTION. FLOOR SHALL BE CLEAN AND FREE FROM DIRT, FOREIGN SUBSTANCE AND DEBRIS.

2.6.2. BOTTOM: VACUUM TEST SEAMS IN FLOOR PLATES.

2.6.3. SHELL: TEST BY FILLING WITH WATER TO ELEVATION OF OVERFLOW. COMPLETED STORAGE TANK SHALL SHOW NO LEAKS AT END OF 24 HOUR TEST PERIOD.

2.7. WARRANTY

2.7.1. THE TANK MANUFACTURER SHALL WARRANT THE TANK AGAINST ANY DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SHIPMENT. IN THE EVENT ANY SUCH DEFECT SHOULD APPEAR, IT SHOULD BE REPORTED IN WRITING TO THE MANUFACTURE DURING THE WARRANTY PERIOD.

2.7.2. THE TANK SHALL BE DEEMED ACCEPTED WHEN THE RESERVOIR HAS BEEN PROVEN FREE FROM LEAKS AND OTHER DEFECTS TO THE SATISFACTION OF THE OWNER. THE ACCEPTANCE BY THE OWNER OF THE COMPLETED WORK AS HEREIN SPECIFIED IS SUBJECT TO THE CONTRACTOR'S WARRANTY FOR THE COMPLETED WORK AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP FURNISHED BY THE CONTRACTOR FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE OF THE WORK.

CODE SECTION	INSPECTION	FREQUENCY
1705.2.1, STEEL	1. Material verification of high-strength bolts, nuts, and washers.	Periodic
	a. Identification markings to conform to ASTM stds specified in the approved construction documents.	
	b. Manufacturer's certificate of compliance required.	
1705.2.1, STEEL	2. Inspection of high-strength bolting:	
	a. Bearing-type connections.	a. Periodic
	b. Slip-critical connections	b. Continuous
1705.2.1, STEEL	3. Material verification of structural steel:	One time
	a. Identification markings to conform to ASTM stds specified in the approved construction documents.	
	b. Manufacturer's mill test reports	
1705.2.1, STEEL	4. Material verification of weld filler materials:	One time
	a. Identification markings to conform to AWS designation listed in the WPS.	
	b. Manufacturer's certificate of compliance required.	
1705.2.1, STEEL	5. Inspection of welding for Structural steel	
	a. Complete and partial penetration groove welds.	a. Continuous
	b. Multi-pass fillet welds.	b. Continuous
	c. Single-pass fillet welds > 5/16"	c. Continuous
	d. Single-pass fillet welds under 5/16"	d. Periodic
	e. Floor and roof deck welds.	e. Periodic
1705.2.1, STEEL	6. Inspection of steel frame joint details for compliance with approved construction documents:	Continuous
	a. Details such as bracing and stiffening.	
	b. Member locations.	
	c. Application of joint details at each connection.	
Table 1705.3	1. Inspection of reinforcing steel, including pre-stressing tendons and placement.	1. Periodic
	4. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased.	2. One time
	5. Verifying use of required design mix.	3. Continuous
	6. At time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests and determine the temperature of the concrete.	4. Continuous
	7. Inspection of concrete and shotcrete placement for proper application techniques.	5. Continuous
	8. Inspection for maintenance of specified curing temperature and techniques.	6. Periodic
	12. Inspect formwork for shape, location, and dimensions of the concrete member being formed.	7. Periodic
Table 1705.6 SOILS	1. Verify materials below footings are adequate to achieve the desired bearing capacity.	1. Periodic
	2. Verify excavations are extended to proper depth and have reached proper material.	2. Periodic
	3. Perform classification and testing of controlled fill materials.	3. Periodic
	4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill.	4. Continuous
	5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.	5. Periodic
1705.11 WIND	1. Roof cladding and roof framing connections.	1. One Time
	2. Wall connections to roof and floor diaphragms and framing.	2. One Time
	3. Roof and floor diaphragm systems, including collectors, drag struts and boundary elements	3. One Time
	4. Vertical wind-force-resisting systems, including braced frames, moment frames, and shear walls.	4. One Time
	5. Wind-force-resisting system connections to the foundation.	5. One Time
	6. Fabrication and installation of systems or components required to meet the impact resistance requirements of Section 1609.1.2.	6. One Time
1705.12.1	Special inspection for welding in accordance with AISC 341.	Continuous
1705.11 COLD-FORMED STEEL FRAMING	1. Welding of elements of the seismic-force-resisting system.	1. Periodic
	2. Inspection of screw attachments, bolting, anchoring, and other fastening of components within the seismic-force-resisting system including struts, braces, and hold-downs.	2. Periodic
1705.12.6 MECHANICAL AND ELECTRICAL COMPONENTS	1. Inspect anchorage of electrical equipment for emergency or stand-by power systems.	1. Periodic
	2. Inspect anchorage of non-emergency electrical equipment.	2. Periodic
	3. Inspect installation of vibration isolation systems where required by Section 1707.8.	3. Periodic
1705.12.8	Verify that the equipment label and anchorage or mounting conforms to the certificate of compliance when mechanical and electrical equipment must be seismically qualified.	One time
1705.12.8	Seismic isolation system: Inspection of isolation system per ASCE 7 – Section 17.2.4.8	Periodic

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER A. STERLING — No. 68703 — CIVIL — STATE OF CALIFORNIA — NOT FOR CONSTRUCTION

STEEL WATER TANK SPECIFICATIONS (CONTINUED) & INSPECTIONS

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	NO SCALE		
SUBMITTAL:	60% SUBMITTAL		

G1.5

SITE ACCESS NOTES:

LEWIS TANK SITE:

FROM SANTA CRUZ:
- HEAD NORTH ON GRAHAM HILL ROAD
- TURN RIGHT TO HEAD NORTH ONTO E ZAYANTE ROAD
- AT FORK KEEP LEFT TO HEAD NORTH ON LOMPICO ROAD
- TURN LEFT TO HEAD WEST ON WEST DRIVE
- KEEP LEFT ON WEST DRIVE AT SEQUOIA AVENUE TO HEAD SOUTH
- FOLLOW WEST DRIVE END TO REACH LEWIS TANK SITE

FROM SCOTTS VALLEY:
- HEADING SOUTH ON HIGHWAY 17 TAKE EXIT 3 FOR MOUNT HERMON ROAD
- TURN LEFT TO HEAD EAST ON GRAHAM HILL ROAD
- TURN LEFT TO HEAD NORTH ONTO E ZAYANTE ROAD
- AT FORK KEEP LEFT TO HEAD NORTH ON LOMPICO ROAD
- TURN LEFT TO HEAD WEST ON WEST DRIVE
- KEEP LEFT ON WEST DRIVE AT SEQUOIA AVENUE TO HEAD SOUTH
- FOLLOW WEST DRIVE END TO REACH LEWIS TANK SITE

WELL DESTRUCTION:

1. WELL DESTRUCTION SHALL BE PERFORMED BY A WELL DRILLING CONTRACTOR WITH A VALID C-57 LICENSE.
2. OBTAIN A WELL DESTRUCTION PERMIT FROM THE SANTA CRUZ COUNTY DIVISION OF ENVIRONMENTAL HEALTH.
3. REMOVE THE EXISTING SUBMERSIBLE WELL PUMP AND CASING. REMOVED EQUIPMENT MAY BE SALVAGED BY THE CONTRACTOR OR DISPOSED OF AT THE APPLICABLE RECYCLING FACILITY.
4. DESTROY THE WELL BY COMPLETELY FILLING THE CASING WITH NEAT CEMENT, PLACED FROM THE BOTTOM UPWARDS USING METHODS THAT WILL AVOID SEGREGATION OR DILUTION OF MATERIAL.
5. COMPLY WITH THE REQUIREMENTS OF CALIFORNIA DEPARTMENT OF WATER RESOURCES BULLETIN 74-81 AND 74-90, AND SANTA CRUZ COUNTY CODE CHAPTER 7.70.
6. NOTIFY OWNER A MINIMUM OF 5 DAYS BEFORE THE WORK TO COORDINATE SITE ACCESS AND WATER SUPPLY.
7. CUT OFF THE CASING AT 5-FEET BELOW THE FINAL GRADE FOR THE SITE (6-FEET BELOW TOP OF EXISTING CONCRETE PAD). BACKFILL WITH CLEAN NATIVE MATERIAL.
8. SUBMIT COMPLETE RECORDS OF THE WELL DESTRUCTION PROCEDURE TO PROVIDE A RECORD THAT THE HOLE WAS PROPERLY SEALED. THE RECORDS SHALL INCLUDE TYPE, DEPTH, AND QUANTITY OF SEALING MATERIAL; MEASUREMENTS OF STATIC WATER LEVELS; AND ANY CHANGES IN THE WELL MADE DURING THE ABANDONMENT PROCEDURE SUCH AS PERFORATING CASING.

CONFIDENTIAL LOG Water Code Sec. 13752

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

CONFIDENTIAL LOG Water Code Sec. 13752

Do Not Fill In
№ 74341
State Well No. 10S/2W-3A5
Other Well No.

(2) LOCATION OF WELL:
County Santa Cruz Owner's number, if any #5
Township, Range, and Section
Distance from cities, roads, railroads, etc. End of West Drive

(3) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐
If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) EQUIPMENT:
Rotary ☑
Cable ☐
Other ☐

(6) CASING INSTALLED:
STEEL: ✓ OTHER:
SINGLE ☒ DOUBLE ☐

If gravel packed

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
~~0~~	~~80~~	~~8¾~~		13½	50	400
0	50	14	¼	20		
0	400	8¾	¼			

Size of shoe or well ring: Cone Size of gravel: #8 sand
Describe joint Welded collar

(7) PERFORATIONS OR SCREEN:
Type of perforation or name of screen Johnson Type 304

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
70	80			.040 slot
90	100			
225	235			
390	400			

(8) CONSTRUCTION:
Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 50 ft.
Were any strata sealed against pollution? Yes ☒ No ☐ If yes, note depth of strata
From 0 ft. to 50 ft.
From ft. to ft.
Method of sealing Cement

(9) WATER LEVELS:
Depth at which water was first found, if known 70 ft.
Standing level before perforating, if known 70 ft.
Standing level after perforating and developing 178 ft.

(10) WELL TESTS:
Was pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Temperature of water Was a chemical analysis made? Yes ☐ No ☐
Was electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:
Total depth 410 ft. Depth of completed well 400 ft.
Formation: *Describe by color, character, size of material, and structure*

ft. to ft.	
0 — 76'	White Sand
76 — 225	Brown shale
225 - 235	Fractured shale
235 - 320	Brown Shale
320 - 350	Fractured shale
350 - 410	Fractured shale

Work started 8/26 1975 Completed 9/18 1975

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME LANDINO Const & Well DRILLING
(Person, firm, or corporation) (Typed or printed)
Address 5360 Coast Road
Santa Cruz, California 95060
[SIGNED] Tony Landino
(Well Driller)
License No. 201380 Dated 10/6, 1975

SKETCH LOCATION OF WELL ON REVERSE SIDE ✓

DWR 188 (REV. 9-68)

25179-950 9-68 50M TRIP ∆D OSP

SOURCE: USGS TOPO FELTON QUADRANGLE-CALIFORNIA-SANTA CRUZ CO. 7.5-MINUTE SERIES

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

PRELIMINARY NOT FOR CONSTRUCTION

LEWIS SITE SPECIFIC NOTES

LOMPICO TANKS REPLACEMENT

SLVWD NO. ______

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=500'		
SUBMITTAL:	60% SUBMITTAL		

G1.6
SHEET 7 OF 25

SITE ACCESS NOTES:

KASKI TANK SITE:

FROM SANTA CRUZ:
- HEAD NORTH ON GRAHAM HILL ROAD
- TURN RIGHT TO HEAD NORTH ONTO E ZAYANTE ROAD
- AT FORK KEEP LEFT TO HEAD NORTH ON LOMPICO ROAD
- TURN SHARP RIGHT ONTO LAKE BOULEVARD
- TURN LEFT ONTO LAKE SHORE DRIVE
- TURN RIGHT ONTO LAKEVIEW AVENUE
- TURN LEFT ONTO OCEANVIEW AVENUE
- TURN LEFT TO HEAD NORTH ON TROMBA ROAD
- TURN LEFT TO HEAD WEST ON TROMBA ROAD

FROM SCOTTS VALLEY:
- HEADING SOUTH ON HIGHWAY 17 TAKE EXIT 3 FOR MOUNT HERMON ROAD
- TURN LEFT TO HEAD EAST ON GRAHAM HILL ROAD
- TURN LEFT TO HEAD NORTH ONTO E ZAYANTE ROAD
- AT FORK KEEP LEFT TO HEAD NORTH ON LOMPICO ROAD
- TURN SHARP RIGHT ONTO LAKE BOULEVARD
- TURN LEFT ONTO LAKE SHORE DRIVE
- TURN RIGHT ONTO LAKEVIEW AVENUE
- TURN LEFT ONTO OCEANVIEW AVENUE
- TURN LEFT TO HEAD NORTH ON TROMBA ROAD
- TURN LEFT TO HEAD WEST ON TROMBA ROAD

SOURCE: USGS TOPO FELTON QUADRANGLE-CALIFORNIA-SANTA CRUZ CO. 7.5-MINUTE SERIES

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

KASKI SITE SPECIFIC NOTES

LOMPICO TANKS REPLACEMENT

SLVWD NO. ______

San Lorenzo Valley WATER DISTRICT

DESIGNED BY: CJM DATE: 05/29/2019
DRAWN BY: CJM DATE: 05/29/2019
QC CHECKED BY: AAS DATE: 05/29/2019
PROJECT NO.:
SCALE: 1"=500'
SUBMITTAL: 60% SUBMITTAL

G1.7
SHEET 8 OF 25

SITE ACCESS NOTES:

MADRONE TANK SITE:

FROM SANTA CRUZ:

- HEAD NORTH ON GRAHAM HILL ROAD
- TURN RIGHT TO HEAD NORTH ONTO E ZAYANTE ROAD
- AT FORK KEEP LEFT TO HEAD NORTH ON LOMPICO ROAD
- TURN SHARP RIGHT ONTO LAKE BOULEVARD
- TURN LEFT ONTO LAKESHORE DRIVE
- TURN RIGHT ONTO LAKEVIEW AVENUE
- TURN SHARP LEFT ONTO EDGEWOOD DRIVE
- EDGEWOOD DRIVE TURNS RIGHT AND BECOMES GLADYS AVENUE
- TURN RIGHT ONTO CANYON VIEW AVENUE
- CANYON VIEW AVENUE TURNS LEFT AND BECOMES MADRONE AVENUE
- TURN RIGHT ONTO WILAWAY AVENUE

FROM SCOTTS VALLEY:

- HEADING SOUTH ON HIGHWAY 17 TAKE EXIT 3 FOR MOUNT HERMON ROAD
- TURN LEFT TO HEAD EAST ON GRAHAM HILL ROAD
- TURN LEFT TO HEAD NORTH ONTO E ZAYANTE ROAD
- AT FORK KEEP LEFT TO HEAD NORTH ON LOMPICO ROAD
- TURN SHARP RIGHT ONTO LAKE BOULEVARD
- TURN LEFT ONTO LAKESHORE DRIVE
- TURN RIGHT ONTO LAKEVIEW AVENUE
- TURN SHARP LEFT ONTO EDGEWOOD DRIVE
- EDGEWOOD DRIVE TURNS RIGHT AND BECOMES GLADYS AVENUE
- TURN RIGHT ONTO CANYON VIEW AVENUE
- CANYON VIEW AVENUE TURNS LEFT AND BECOMES MADRONE AVENUE
- TURN RIGHT ONTO WILAWAY AVENUE

SOURCE: USGS TOPO FELTON QUADRANGLE-CALIFORNIA-SANTA CRUZ CO. 7.5-MINUTE SERIES

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER J. MINDT
CIVIL
STATE OF CALIFORNIA
CONSTRUCTION

MADRONE SITE SPECIFIC NOTES

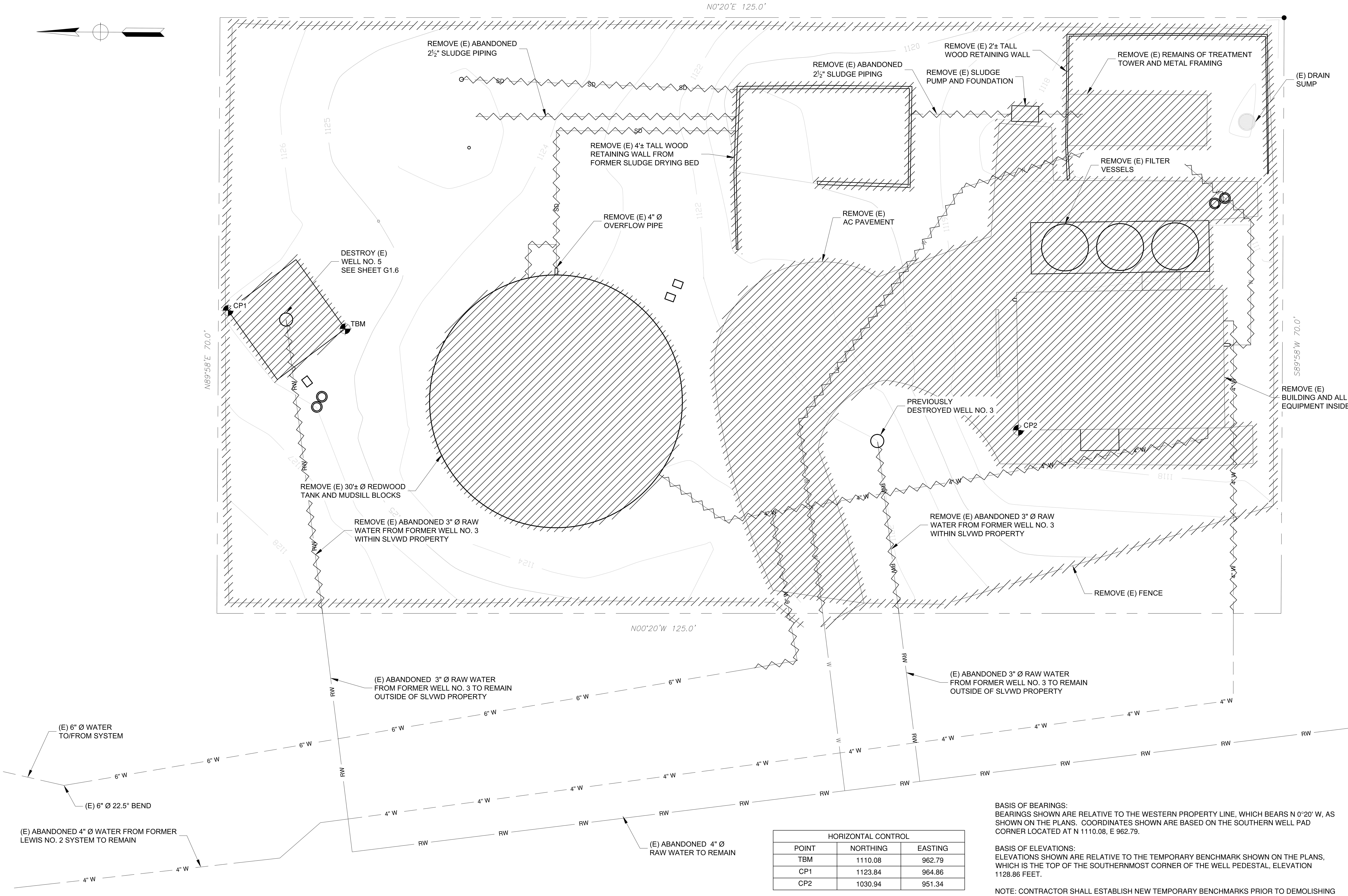
LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=500'		
SUBMITTAL:	60% SUBMITTAL		

G1.8



HORIZONTAL CONTROL		
POINT	NORTHING	EASTING
TBM	1110.08	962.79
CP1	1123.84	964.86
CP2	1030.94	951.34

BASIS OF BEARINGS:
BEARINGS SHOWN ARE RELATIVE TO THE WESTERN PROPERTY LINE, WHICH BEARS N 0°20' W, AS SHOWN ON THE PLANS. COORDINATES SHOWN ARE BASED ON THE SOUTHERN WELL PAD CORNER LOCATED AT N 1110.08, E 962.79.

BASIS OF ELEVATIONS:
ELEVATIONS SHOWN ARE RELATIVE TO THE TEMPORARY BENCHMARK SHOWN ON THE PLANS, WHICH IS THE TOP OF THE SOUTHERNMOST CORNER OF THE WELL PEDESTAL, ELEVATION 1128.86 FEET.

NOTE: CONTRACTOR SHALL ESTABLISH NEW TEMPORARY BENCHMARKS PRIOR TO DEMOLISHING EXISTING TEMPORARY BENCHMARKS.

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

LEWIS
SITE DEMOLITION PLAN
LOMPICO TANKS REPLACEMENT

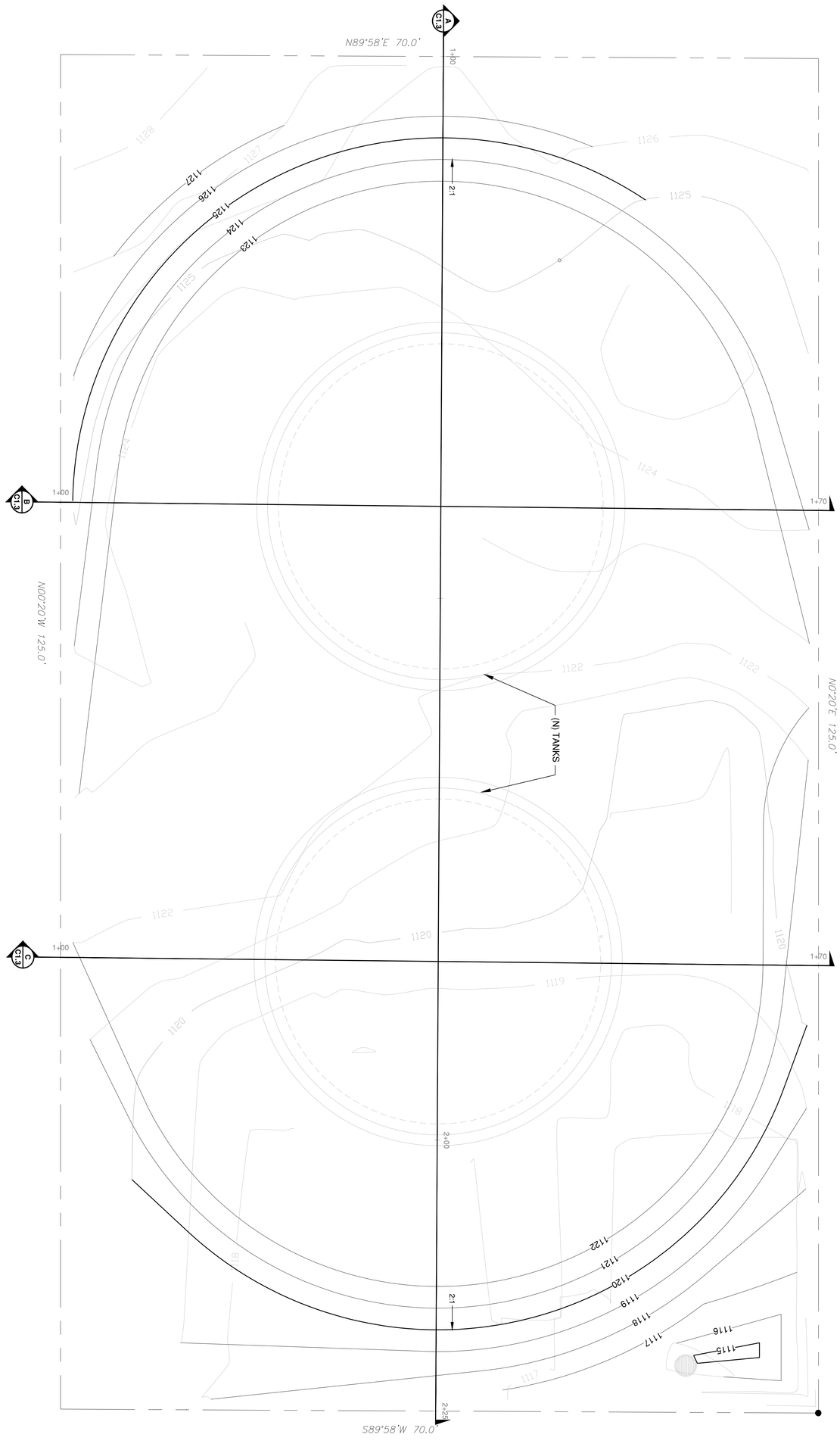
SLVWD NO. ______

San Lorenzo Valley Water District

DESIGNED BY: CJM DATE: 05/29/2019
DRAWN BY: CJM DATE: 05/29/2019
QC CHECKED BY: AAS DATE: 05/29/2019
PROJECT NO.:
SCALE: 1"=5'
SUBMITTAL: 60% SUBMITTAL

C1.1
SHEET 10 OF 25

PRELIMINARY - NOT FOR CONSTRUCTION



0 5 10
SCALE IN FEET

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=5'		
SUBMITTAL:	60% SUBMITTAL		

SHEET 11 OF 25
C1.2

San Lorenzo Valley WATER DISTRICT

LEWIS
SITE GRADING PLAN

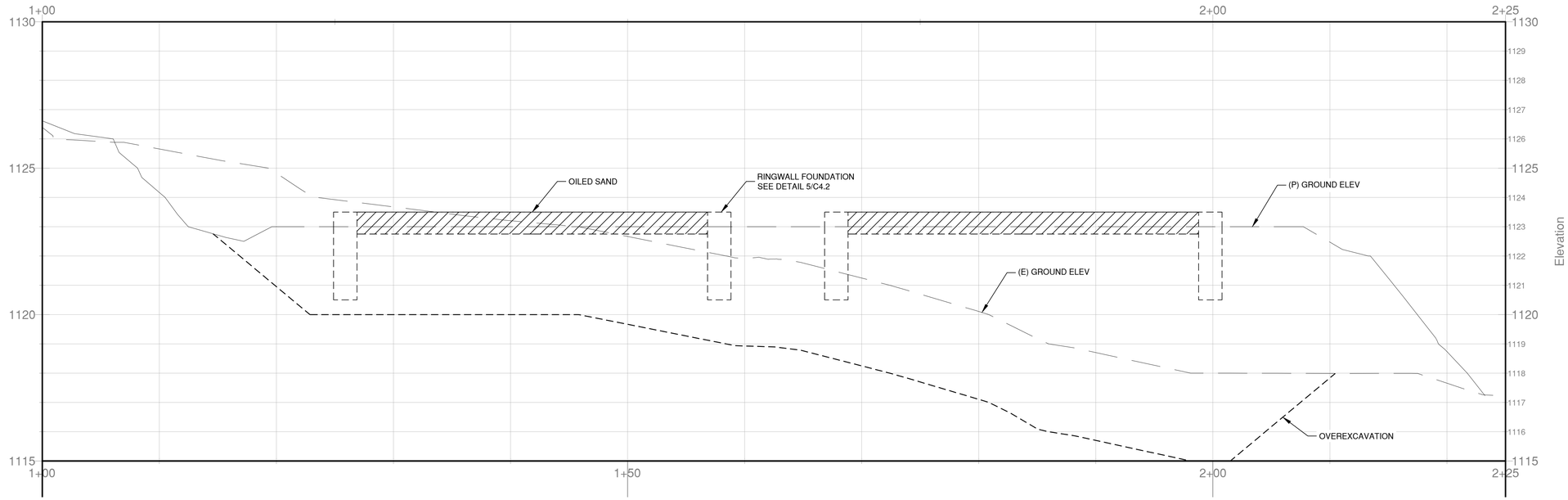
LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

REGISTERED PROFESSIONAL ENGINEER
ANDREW A. STERGULZ
No. 68703
CIVIL
STATE OF CALIFORNIA
PRELIMINARY NOT FOR CONSTRUCTION

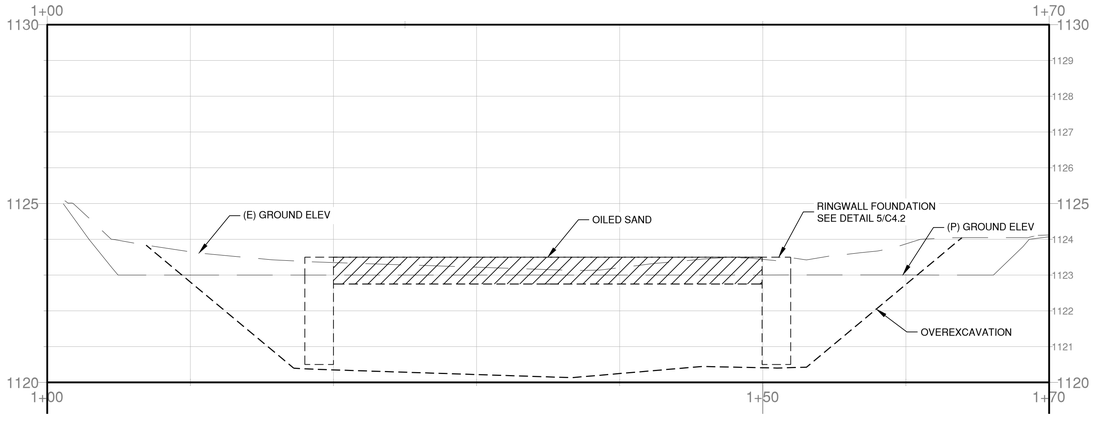
Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			



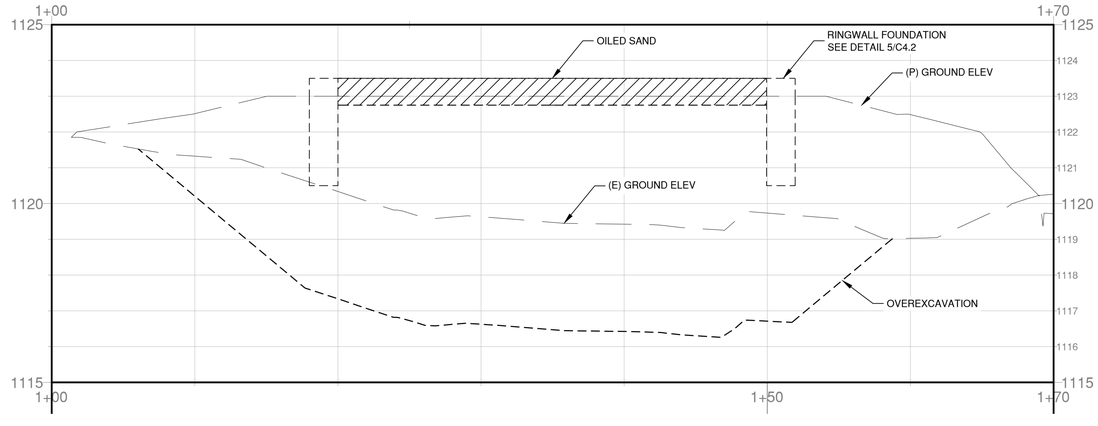
SECTION A

HORIZONTAL 1"=5'
VERTICAL 1"=2'



SECTION B

HORIZONTAL 1"=5'
VERTICAL 1"=2'



SECTION C

HORIZONTAL 1"=5'
VERTICAL 1"=2'

NOTES:
OVEREXCAVATE AND RECOMPACT EXISTING SUBGRADE PER GEOTECH REPORT. LIMIT OF OVER-EXCAVATION IS NOMINALLY 3-FEET, SUBJECT TO FIELD APPROVAL BY THE GEOTECHNICAL ENGINEER, OR WHERE SANDSTONE/SILTSTONE IS ENCOUNTERED.

0 5 10
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERRENBERG No. 68703 CIVIL STATE OF CALIFORNIA
APPROVED FOR CONSTRUCTION

LEWIS
SITE GRADING SECTIONS

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	AS SHOWN		
SUBMITTAL:	60% SUBMITTAL		

C1.3
SHEET 12 OF 25

N0°20'E 125.0'

(N) TEMPORARY TANK (TYP OF 4) SEE DETAIL 5/4.3

TEMPORARY INLET/OUTLET (TYP OF 4)

4" W

4" W

N89°58'E 70.0'

6" W

NORMAL TEMPORARY STORAGE OUTLET

(N) 6' TALL CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE, BOTTOM FINISH GRADE EL 1122.50 SEE DETAIL 2/C4.4

(N) 32' Ø STEEL TANK (TYP OF 2) SEE DETAIL 1/C4.1 & 4/C4.2

(N) CONCRETE RINGWALL FOOTING TOP EL 1123.50, ADJACENT AC PAVEMENT EL 1123.00 (TYP OF 2)

(N) 6" SD

TOP OF SLOPE

(E) DRAIN SUMP

DESTROY WELL NO. 5

CONTROL LINE N34°40'1"E

CENTER N 1083.47 E 964.63

LEWIS TANK 1

8.00'

8.00'

8.00'

CENTER N 1041.48 E 964.76

CONTROL LINE N34°40'1"W

LEWIS TANK 2

6" Ø TANK INLET/OUTLET (TYP OF 2)

PREVIOUSLY DESTROYED WELL NO. 3

(N) 6" TEE

6" W

(N) AC PAVEMENT WITHIN FENCE SEE DETAIL 3/C4.3

12.00'

(N) DOUBLE SWING GATE SEE DETAIL 1/C4.4

DRAINAGE SWALE FLOWLINE

(N) VALLEY GUTTER

(N) DRIVEWAY

N00°20'W 125.0'

S89°58'W 70.0'

INSTALL BLIND FLANGE WHEN TEMPORARY TANKS ARE REMOVED

(N) 6" Ø 11.25° BEND

(N) 6" Ø 90° BEND

(E) ABANDONED 3" Ø RAW WATER FROM FORMER WELL NO. 3 TO REMAIN OUTSIDE OF SLVWD PROPERTY

(E) ABANDONED 3" Ø RAW WATER FROM FORMER WELL NO. 3 TO REMAIN OUTSIDE OF SLVWD PROPERTY

(E) 6" Ø WATER TO/FROM SYSTEM

(N) 6" HOT TAP SEE DETAIL 1/C4.3

(E) 6" Ø 22.5° BEND

(E) ABANDONED 4" Ø WATER FROM FORMER LEWIS NO. 2 SYSTEM TO REMAIN

(E) ABANDONED 4" Ø RAW WATER TO REMAIN

RW

PRELIMINARY - NOT FOR CONSTRUCTION

0 5 10
SCALE IN FEET

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

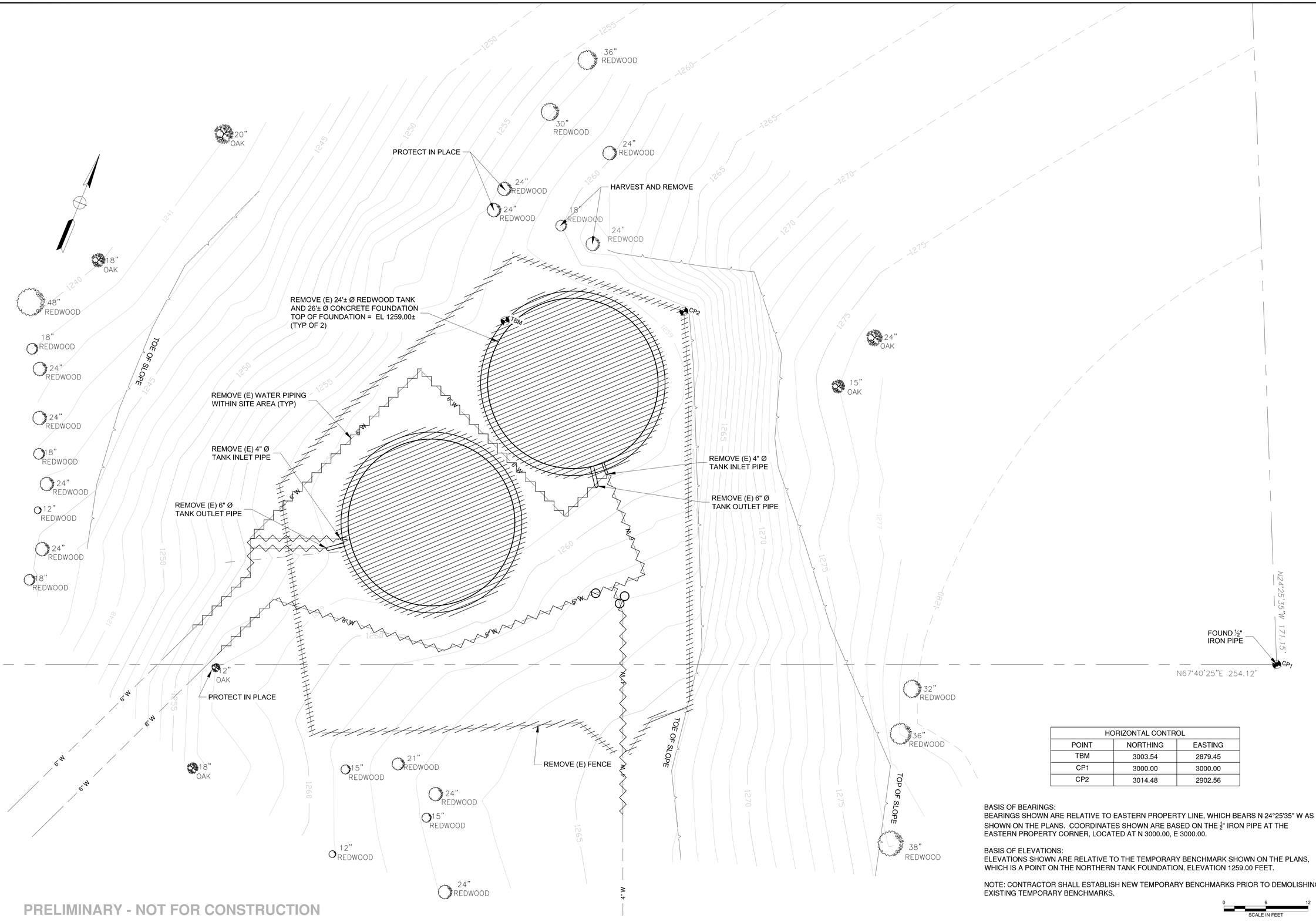
REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 69703 CIVIL STATE OF CALIFORNIA

LEWIS
SITE IMPROVEMENT PLAN
LOMPICO TANKS REPLACEMENT
SLVWD NO.

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE: 05/29/2019
DRAWN BY:	CJM	DATE: 05/29/2019
QC CHECKED BY:	AAS	DATE: 05/29/2019
PROJECT NO.:		
SCALE:	1"=5'	
SUBMITTAL:	60% SUBMITTAL	

C1.4
SHEET 13 OF 25



PRELIMINARY - NOT FOR CONSTRUCTION

HORIZONTAL CONTROL		
POINT	NORTHING	EASTING
TBM	3003.54	2879.45
CP1	3000.00	3000.00
CP2	3014.48	2902.56

BASIS OF BEARINGS:
BEARINGS SHOWN ARE RELATIVE TO EASTERN PROPERTY LINE, WHICH BEARS N 24°25'35" W AS SHOWN ON THE PLANS. COORDINATES SHOWN ARE BASED ON THE ¾" IRON PIPE AT THE EASTERN PROPERTY CORNER, LOCATED AT N 3000.00, E 3000.00.

BASIS OF ELEVATIONS:
ELEVATIONS SHOWN ARE RELATIVE TO THE TEMPORARY BENCHMARK SHOWN ON THE PLANS, WHICH IS A POINT ON THE NORTHERN TANK FOUNDATION, ELEVATION 1259.00 FEET.

NOTE: CONTRACTOR SHALL ESTABLISH NEW TEMPORARY BENCHMARKS PRIOR TO DEMOLISHING EXISTING TEMPORARY BENCHMARKS.

0 6 12
SCALE IN FEET

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING JR. No. 69703 CIVIL STATE OF CALIFORNIA

KASKI
SITE DEMOLITION PLAN

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=6'		
SUBMITTAL:	60% SUBMITTAL		

C2.1
SHEET 14 OF 25

PROTECT IN PLACE

HARVEST & REMOVE

(N) TANKS

TOE OF SLOPE

TOP OF SLOPE

2:1

4:1

1:00

1:88

1:92

6"W

FOUND ½" IRON PIPE

N24°25'35"W 171.15'

N67°40'25"E 254.12'

PRELIMINARY - NOT FOR CONSTRUCTION

0 6 12
SCALE IN FEET

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 67703 CIVIL STATE OF CALIFORNIA

KASKI
SITE GRADING PLAN

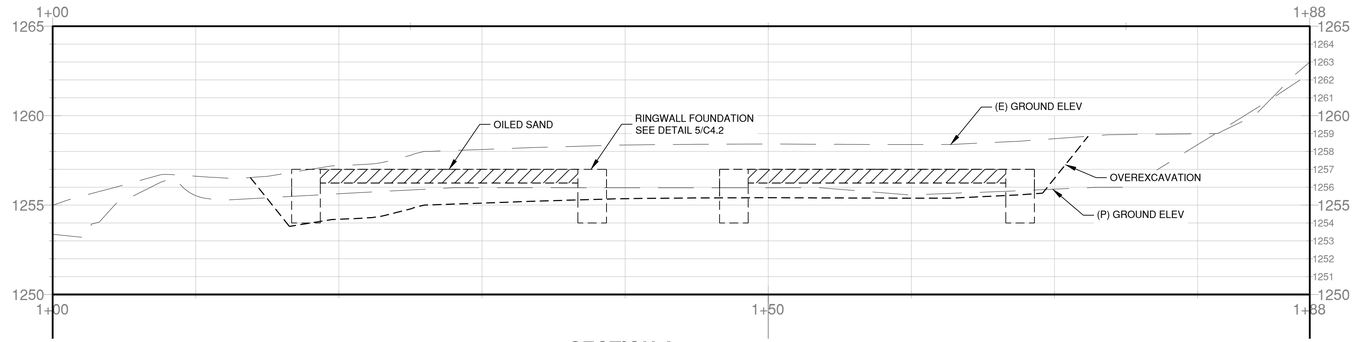
LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

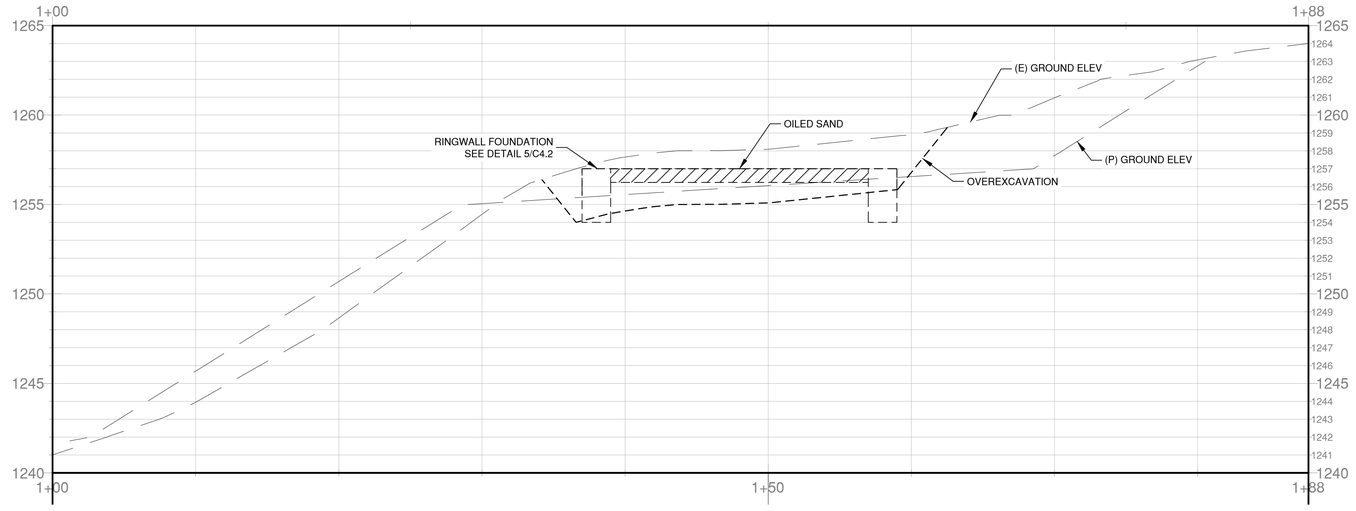
San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE: 05/29/2019
DRAWN BY:	CJM	DATE: 05/29/2019
QC CHECKED BY:	AAS	DATE: 05/29/2019
PROJECT NO.:		
SCALE:	1"=6'	
SUBMITTAL:	60% SUBMITTAL	

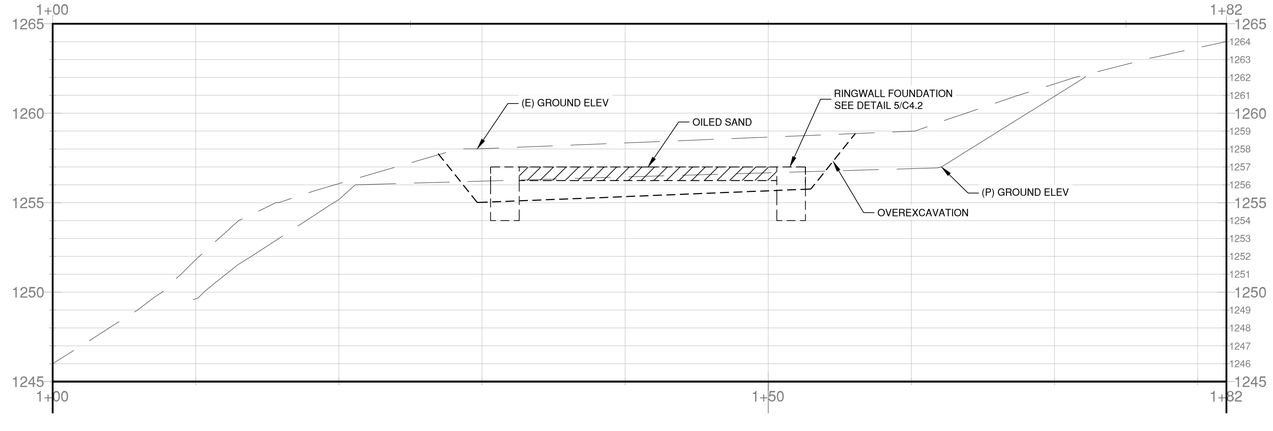
C2.2
SHEET 15 OF 25



SECTION A
HORIZONTAL 1"=5'
VERTICAL 1"=4'



SECTION B
HORIZONTAL 1"=5'
VERTICAL 1"=4'



SECTION C
HORIZONTAL 1"=5'
VERTICAL 1"=4'

NOTES:
OVEREXCAVATE AND RECOMPACT EXISTING SUBGRADE PER GEOTECH REPORT. LIMIT OF OVER-EXCAVATION IS NOMINALLY 3-FEET, SUBJECT TO FIELD APPROVAL BY THE GEOTECHNICAL ENGINEER, OR WHERE SANDSTONE/SILTSTONE IS ENCOUNTERED.

0 5 10
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 68703 CIVIL STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

KASKI
SITE GRADING SECTIONS

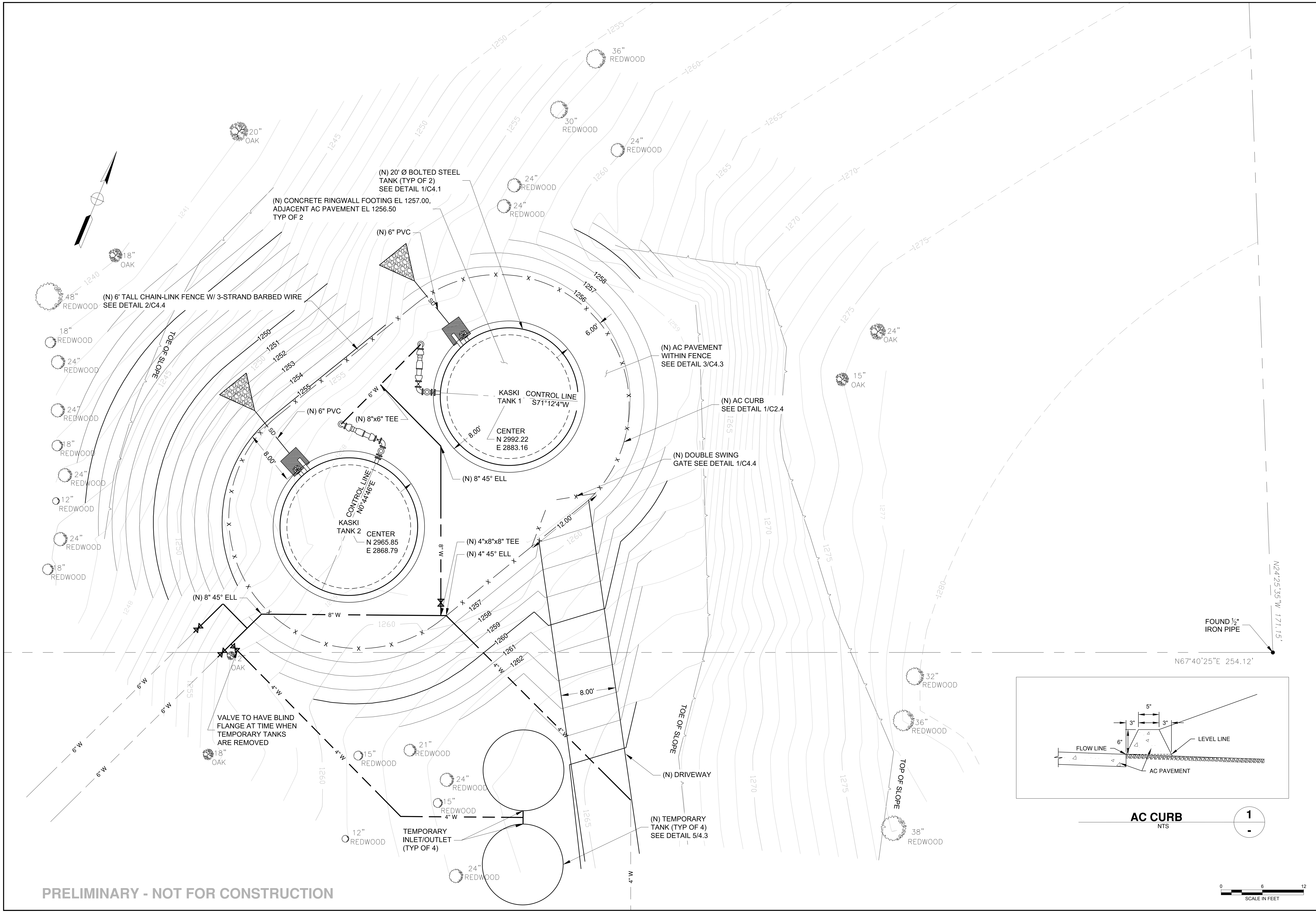
LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	AS SHOWN		
SUBMITTAL:	60% SUBMITTAL		

C2.3
SHEET 16 OF 25



Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

San Lorenzo Valley Water District

KASKI
SITE IMPROVEMENT PLAN
LOMPICO TANKS REPLACEMENT
SLVWD NO. ______

DESIGNED BY: CJM DATE: 05/29/2019
DRAWN BY: CJM DATE: 05/29/2019
QC CHECKED BY: AAS DATE: 05/29/2019
PROJECT NO.:
SCALE: 1"=6'
SUBMITTAL: 60% SUBMITTAL

C2.4
SHEET 17 OF 25

REMOVE (E) FENCE

CP2

REMOVE (E) 4" Ø TANK
OVERFLOW AND DRAIN PIPE

REMOVE (E) 26'± Ø REDWOOD TANK
AND 29'± Ø CONCRETE FOUNDATION
TOP OF FOUNDATION = EL 1316.20±
(TYP OF 2)

REMOVE (E) 4" Ø TANK
OVERFLOW AND DRAIN PIPE

REMOVE (E) TANK
INLET/OUTLET PIPING

TBM

HARVEST AND REMOVE

REMOVE (E) ABANDONED 4" Ø
WATER PIPING WITHIN SITE AREA

4" W

6" W

REMOVE (E) 6" Ø WATER
PIPING WITHIN SITE AREA

CP1

1300
1305
1310
1315

HORIZONTAL CONTROL		
POINT	NORTHING	EASTING
TBM	9988.00	10036.63
CP1	9949.80	10092.00
CP2	10008.53	10017.37

BASIS OF BEARINGS:
BEARINGS SHOWN ARE RELATIVE TO THE WESTERN FENCE LINE, WHICH BEARS N 29°26'35"E AS SHOWN ON THE PLANS. COORDINATES SHOWN ARE BASED ON THE SOUTHERNMOST FENCE CORNER, LOCATED AT N 9949.80, E 10092.00.

BASIS OF ELEVATIONS:
ELEVATIONS SHOWN ARE RELATIVE TO THE TEMPORARY BENCHMARK SHOWN ON THE PLANS, WHICH IS A POINT ON THE EXISTING TANK FOUNDATION, ELEVATION 1316.20 FEET.

NOTE: CONTRACTOR SHALL ESTABLISH NEW TEMPORARY BENCHMARKS PRIOR TO DEMOLISHING EXISTING TEMPORARY BENCHMARKS.

0 5 10
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING JR. No. 69703 CIVIL STATE OF CALIFORNIA

MADRONE
SITE DEMOLITION PLAN
LOMPICO TANKS REPLACEMENT

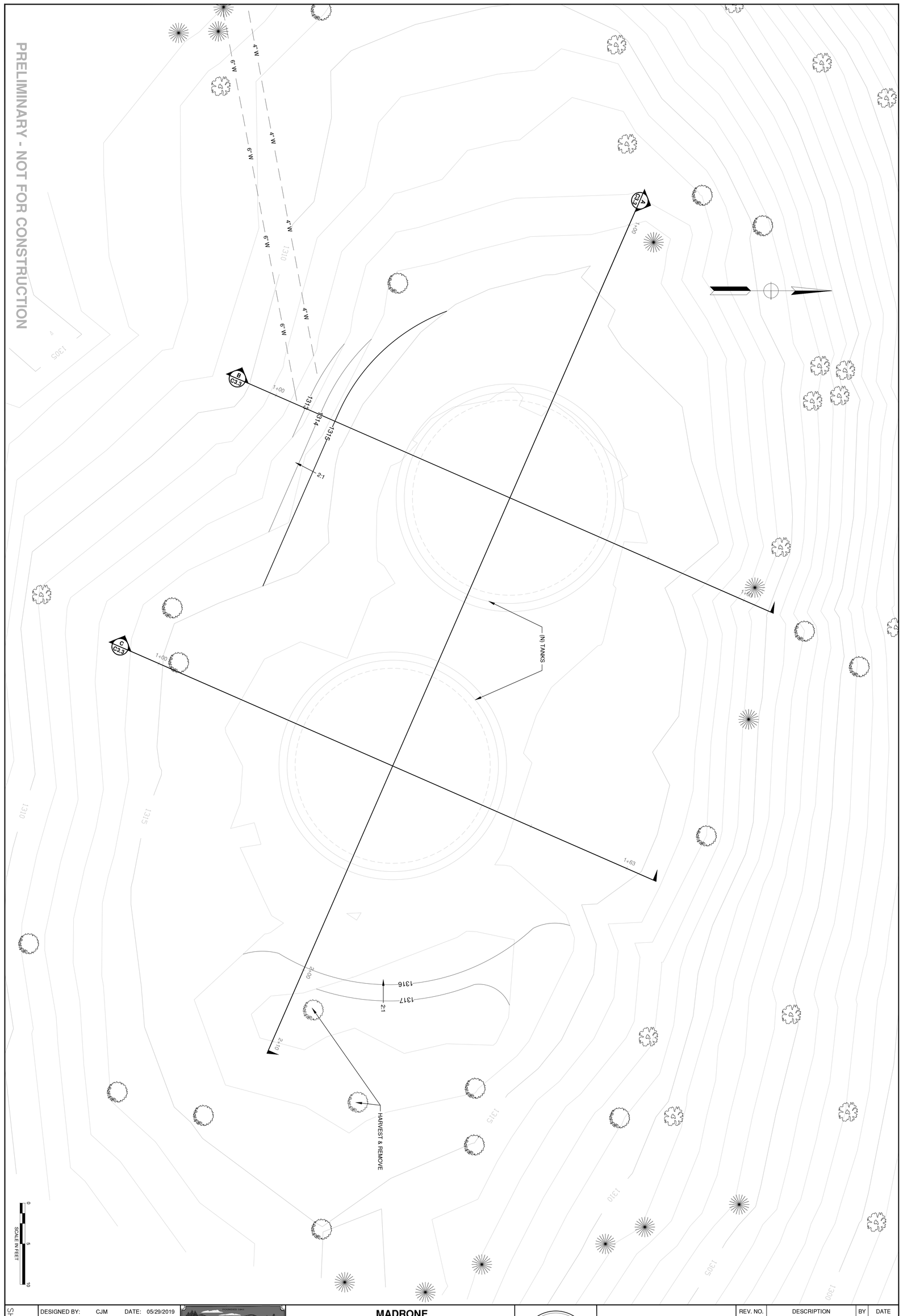
SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

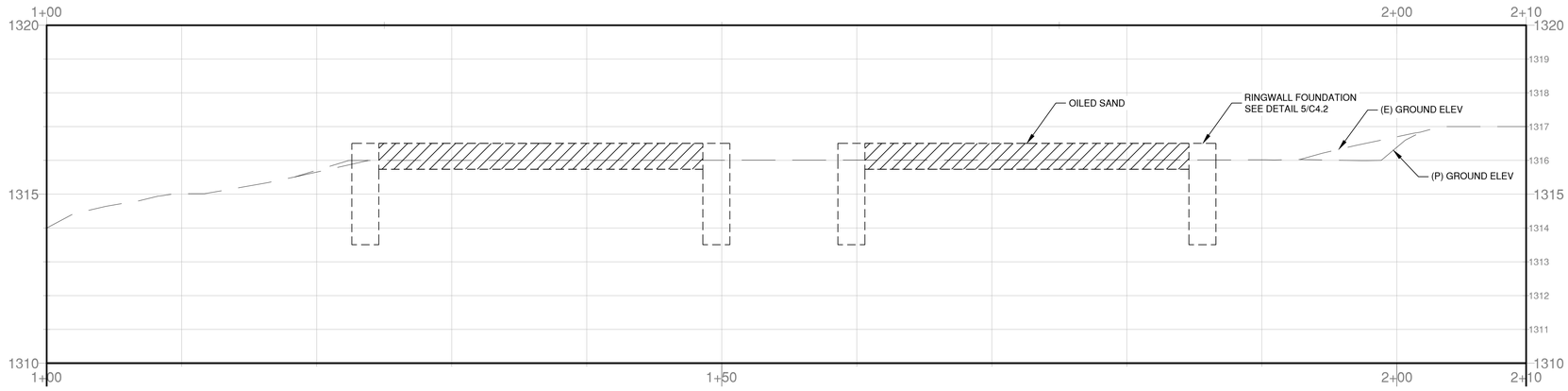
DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=5'		
SUBMITTAL:	60% SUBMITTAL		

C3.1
SHEET 18 OF 25

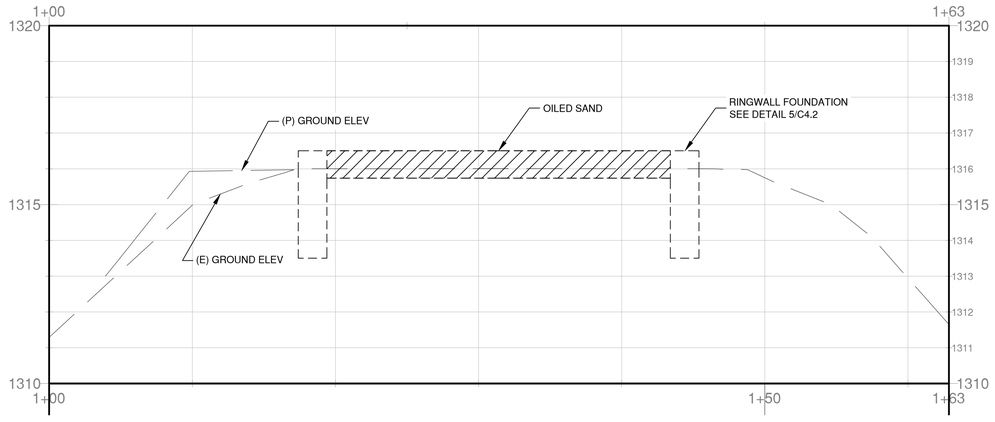
PRELIMINARY - NOT FOR CONSTRUCTION



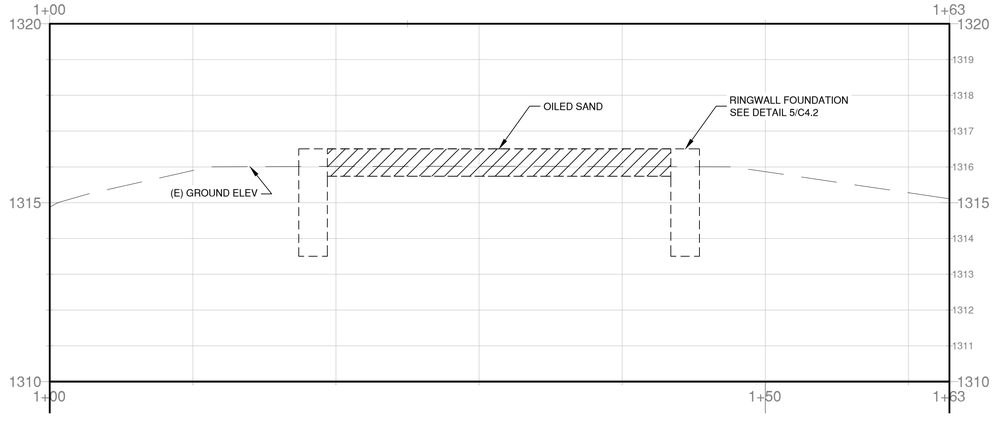
SHEET 19 OF 25 C3.2	DESIGNED BY: CJM DATE: 05/29/2019	San Lorenzo Valley WATER DISTRICT	MADRONE SITE GRADING PLAN	REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERGULZ No. 68705 CIVIL STATE OF CALIFORNIA	Schaaf & Wheeler CONSULTING CIVIL ENGINEERS 3 Quail Run Circle, Suite 101 Salinas, CA 93907-2348 (831) 883-4848	REV. NO.	DESCRIPTION / BY / DATE
	DRAWN BY: CJM DATE: 05/29/2019					1	
	QC CHECKED BY: AAS DATE: 05/29/2019		LOMPICO TANKS REPLACEMENT			2	
	PROJECT NO.:					3	
	SCALE: 1"=5'		SLVWD NO. _____			4	
	SUBMITTAL: 60% SUBMITTAL					5	



SECTION A
HORIZONTAL 1"=5'
VERTICAL 1"=2'



SECTION B
HORIZONTAL 1"=5'
VERTICAL 1"=2'



SECTION C
HORIZONTAL 1"=5'
VERTICAL 1"=2'

NOTES:
OVEREXCAVATE AND RECOMPACT EXISTING SUBGRADE PER GEOTECH REPORT. LIMIT OF OVER-EXCAVATION IS NOMINALLY 3-FEET, SUBJECT TO FIELD APPROVAL BY THE GEOTECHNICAL ENGINEER, OR WHERE SANDSTONE/SILTSTONE IS ENCOUNTERED.

0 5 10
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER A. STERLING — No. 68703 — CIVIL — STATE OF CALIFORNIA

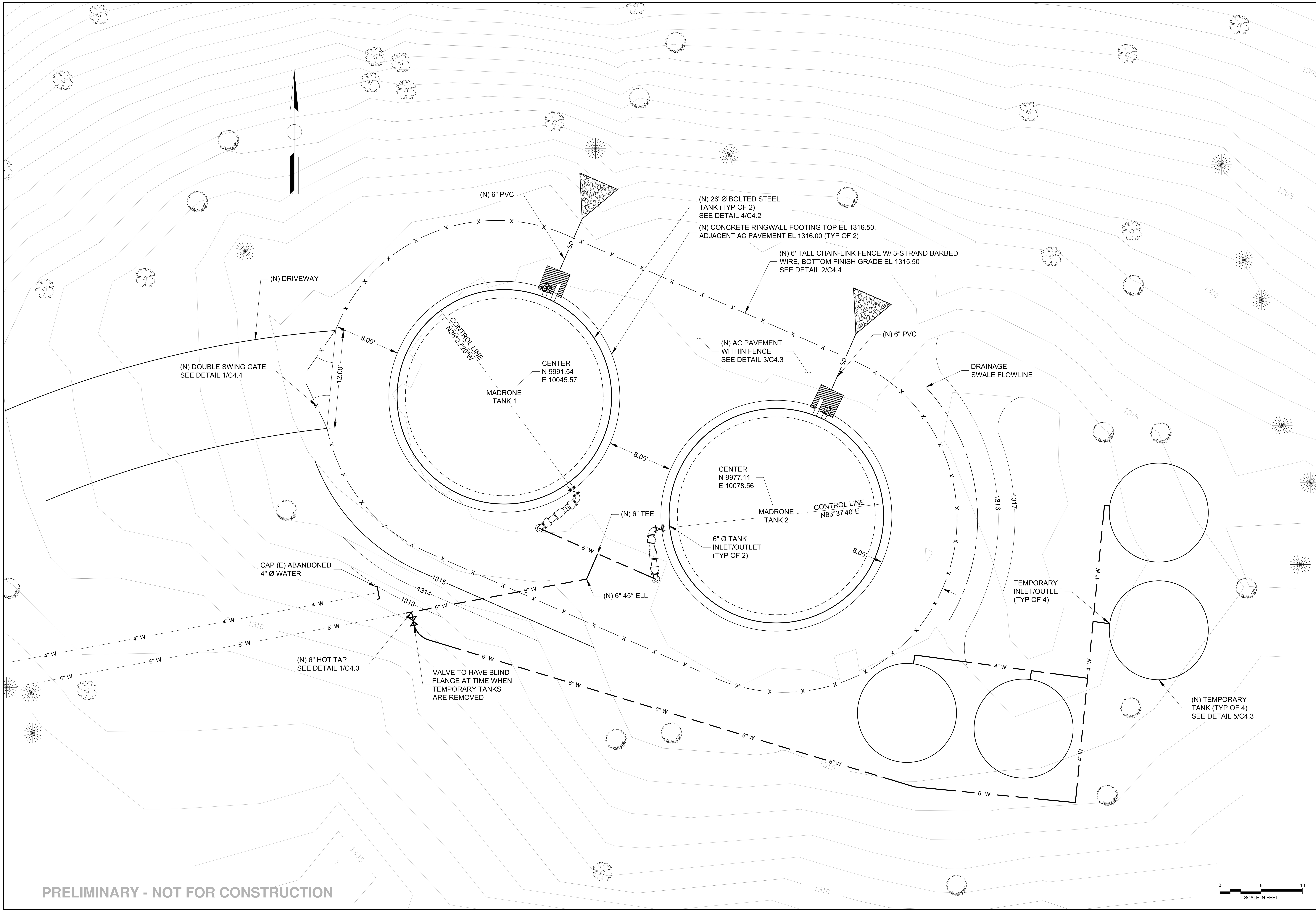
MADRONE
SITE GRADING SECTIONS

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

DESIGNED BY:	CJM	DATE: 05/29/2019
DRAWN BY:	CJM	DATE: 05/29/2019
QC CHECKED BY:	AAS	DATE: 05/29/2019
PROJECT NO.:		
SCALE:	AS SHOWN	
SUBMITTAL:	60% SUBMITTAL	

C3.3
SHEET 20 OF 25



PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

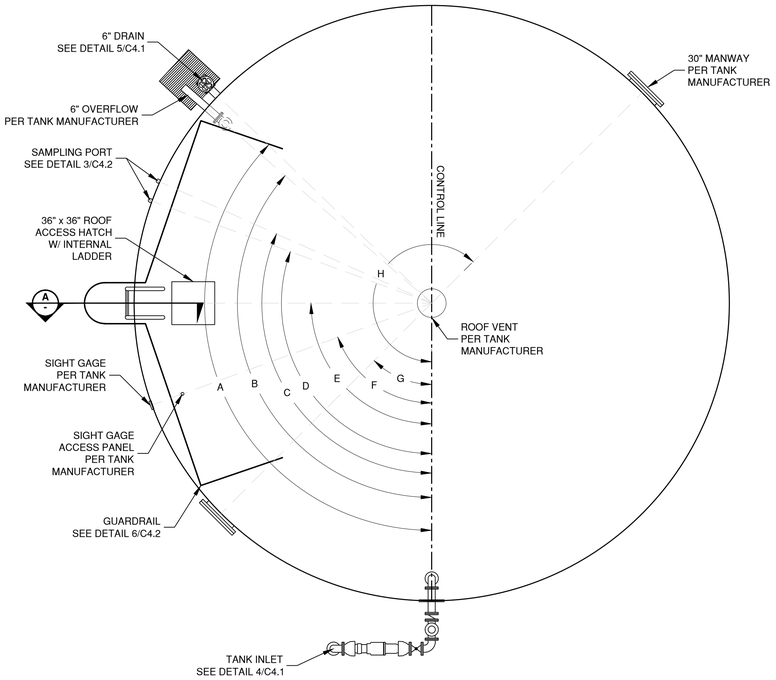
MADRONE SITE GRADING PLAN

LOMPICO TANKS REPLACEMENT

SLVWD NO. ____

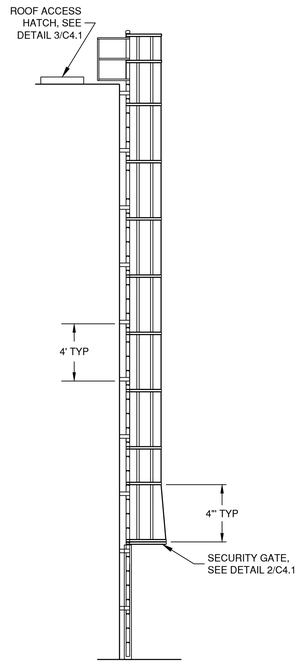
San Lorenzo Valley Water District

DESIGNED BY: CJM DATE: 05/29/2019
DRAWN BY: CJM DATE: 05/29/2019
QC CHECKED BY: AAS DATE: 05/29/2019
PROJECT NO.:
SCALE: 1"=5'
SUBMITTAL: 60% SUBMITTAL



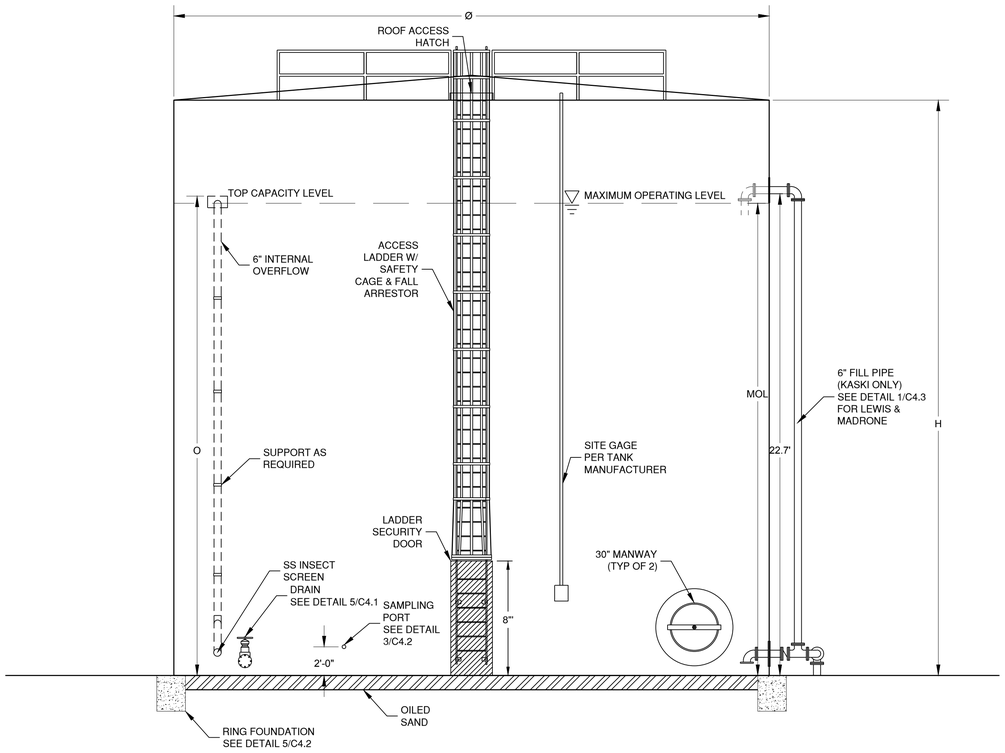
NOTE: FOR APPURTENANCE LOCATIONS SEE SHEET C4.2

KASKI TANK PLAN
NTS — 1 / -

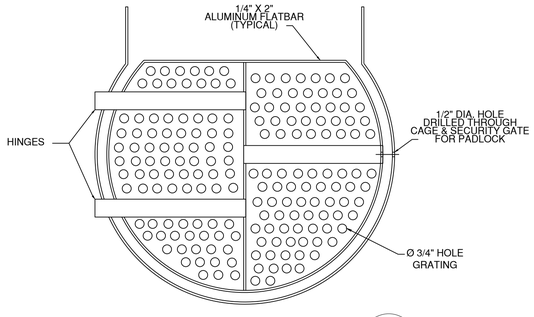


NOTE: REFER TO OSHA STANDARD 1910.27 FOR FIXED LADDERS

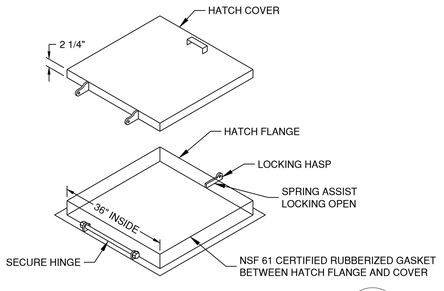
LADDER SECTION
NTS — A / -



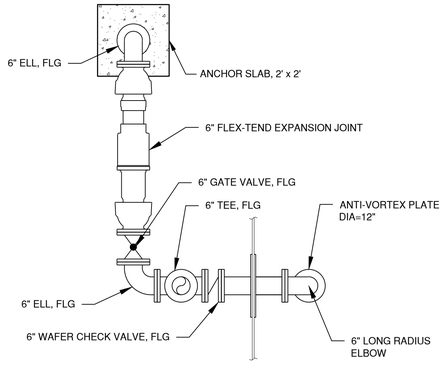
TYPICAL TANK SECTION
NTS — B / -



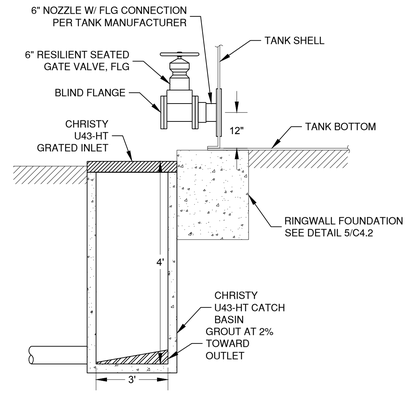
SECURITY GATE
NTS — 2 / -



ACCESS HATCH
NTS — 3 / -



KASKI TANK OUTLET PLAN
1/2"=1' — 4 / -



TANK DRAIN
1/2"=1' — 5 / -

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER A. STERLING — No. 68703 — CIVIL — STATE OF CALIFORNIA — 05/29/19

TANK DETAILS

LOMPICO TANKS REPLACEMENT

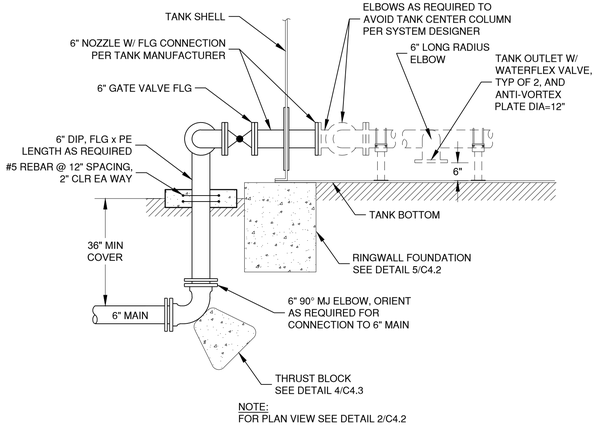
SLVWD NO.

San Lorenzo Valley WATER DISTRICT

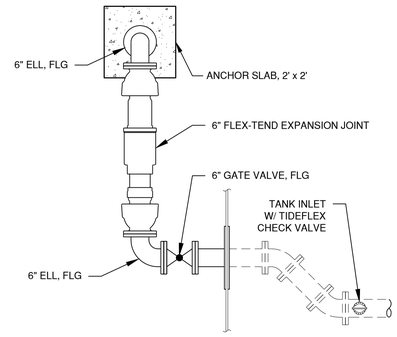
DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	AS SHOWN		
SUBMITTAL:	60% SUBMITTAL		

C4.1

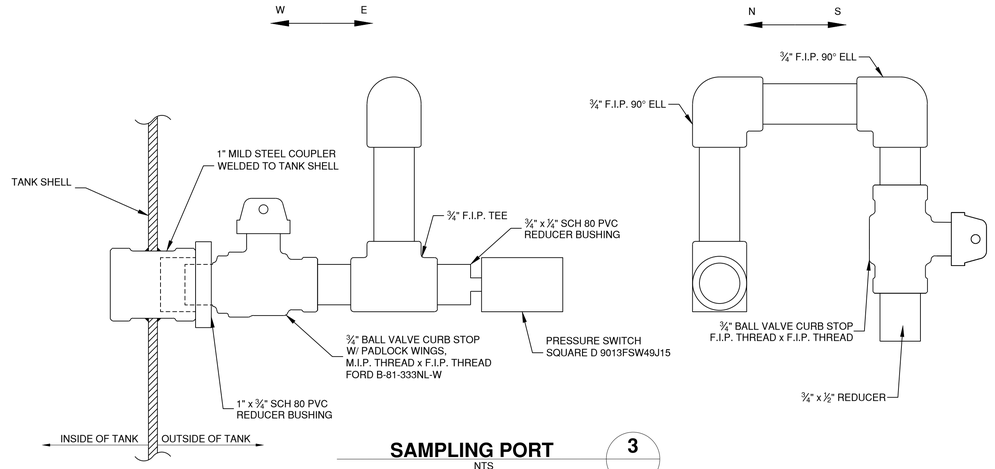
SHEET 22 OF 25



INLET/OUTLET DETAIL
NTS — 1 / -

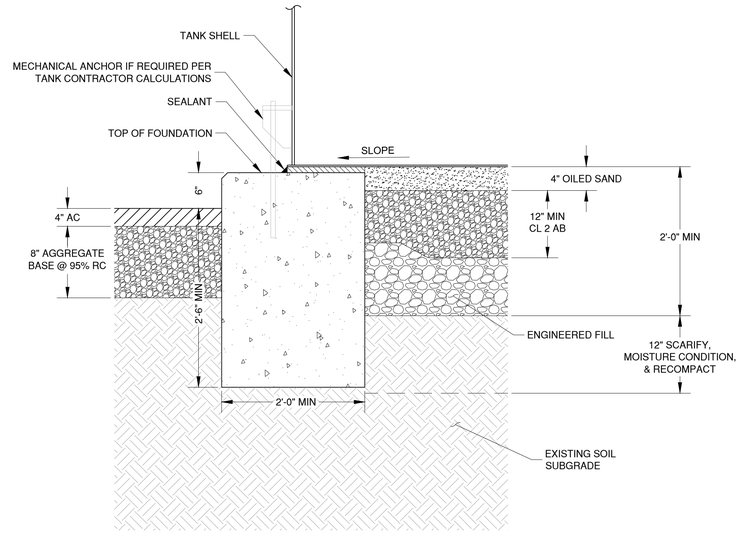


TANK INLET/OUTLET PLAN
NTS — 2 / -



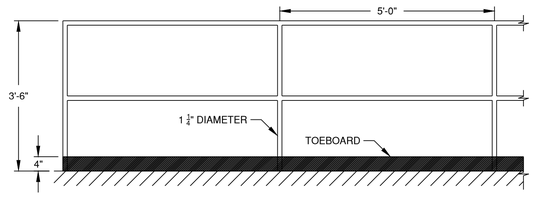
SAMPLING PORT
NTS — 3 / -

TANK PLAN W/ INLET/OUTLET (LEWIS/MADRONE)
NTS — 4 / -



NOTES:
1. FOUNDATION DESIGN, INCLUDING REINFORCEMENT AND ANY REQUIRED MECHANICAL ANCHORAGE, SHALL BE DESIGNED BY THE TANK CONTRACTOR.
2. FOR SELF-ANCHORED TANKS, THE MATERIAL BETWEEN THE TOP OF THE RINGWALL AND THE TANK BOTTOM PLATE SHALL BE A ½ INCH THICK CANE-FIBER JOINT FILLER MEETING THE REQUIREMENTS OF ASTM D1751. AS SUCH, GROUT MAY NOT BE USED TO MEET THE TOLERANCE REQUIREMENTS OF AWWA D100 SECTION 12.6.2. TOLERANCES MUST BE MET BEFORE PLACING THE CANE-FIBER JOINT FILLER.
3. COMPACTED OILED SAND SHALL HAVE 6 TO 8 POUNDS OF SC-800 LIQUID ASPHALT PER 100 POUNDS OF SAND.

RINGWALL FOUNDATION
NTS — 5 / -



GUARDRAIL
NTS — 6 / -

TANK DIMENSIONS

ITEM	LEWIS	KASKI	MADRONE
DIAMETER (Ø)	32	20	26
ROOF (H)	25.00	23.00	25.00
OVERFLOW (O)	19.00	18.00	19.00
MAX WATER (MOL)	18.50	17.50	18.50

APPURTENANCE LOCATIONS

ITEM		LEWIS TANK 1	LEWIS TANK 2	KASKI TANK 1	KASKI TANK 2	MADRONE TANK 1	MADRONE TANK 2
CONTROL LINE	INLET	0°	0°	0°	0°	0°	0°
A	DRAIN	233.5°	126.5°	50.5°	294.8°	237.9°	122.1°
B	OVERFLOW	237.3°	122.7°	44.8°	299.5°	242.9°	117.1°
C	SAMPLING PORT	110°	110°	330°	40.5°	310°	50°
D	SAMPLING PORT	110°	110°	335°	45.5°	315°	45°
E	LADDER/HATCH	325.3°	34.7°	317.4°	27.9°	330°	30°
F	SIGHT GAGE	310.3°	49.7°	302.4°	12.9°	345°	15°
G	MANWAY	30°	330°	80°	265.3°	45°	315°
H	MANWAY	210°	150°	260°	85.3°	225°	135°

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER — ANDREW A. STERRENBERG — No. 69703 — CIVIL — STATE OF CALIFORNIA — 6/30/2020

LOMPICO TANKS REPLACEMENT

TANK DETAILS

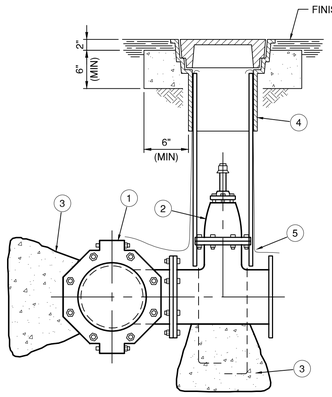
SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019	SCALE:	NOT TO SCALE
DRAWN BY:	CJM	DATE:	05/29/2019	SUBMITTAL:	60% SUBMITTAL
QC CHECKED BY:	AAS	DATE:	05/29/2019		
PROJECT NO.:					

C4.2

SHEET 23 OF 25



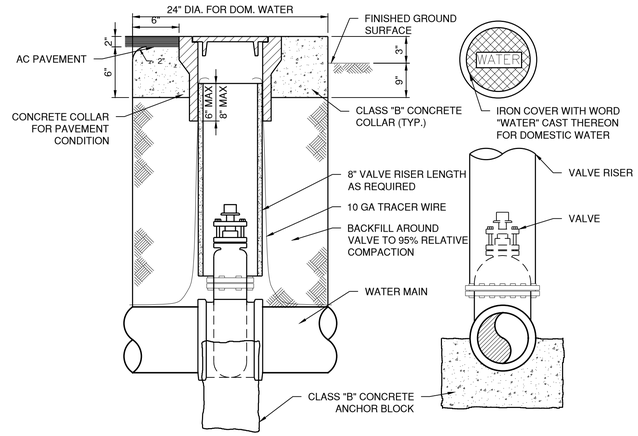
1. TAPPING SLEEVE - CAST IRON, MJ
2. GATE VALVE - RESILIENT WEDGE, FLANGED
3. CONSTRUCT CONCRETE THRUST BLOCK PER DETAIL 4/C4.3
4. VALVE RISER, BOX & LID PER DETAIL 2/C4.3
5. TRACER WIRE

NOTES

1. AIR TEST TAPPING SLEEVE PRIOR TO TAP
2. COAT ALL TAPPING SLEEVE BOLTS WITH KOPPERS BITSMASTIC
3. USE SHELL CUTTER ON ALL PVC TAPS
4. POTHOLE TO VERIFY SIZE AND MATERIAL OF EXISTING PIPE

TAP OF ACP, PVC OR D.I.P. MAINS

HOT TAP 1
NTS -



NOTES:

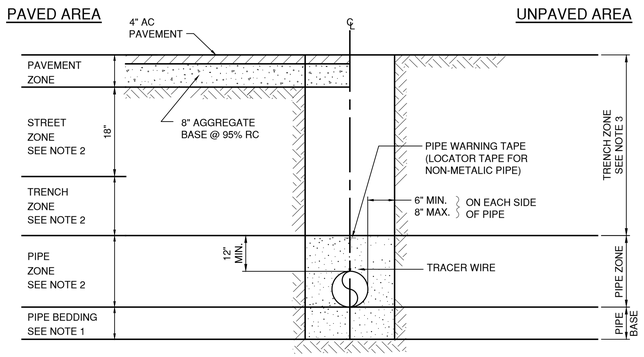
1- PROVIDE VALVE STEM EXTENSION IF DEPTH TO VALVE NUT EXCEEDS 4 FEET.
IN NEW TRACT DEVELOPMENTS EXTEND VALVE WELL PIPE 2' ABOVE GROUND ON "KEY VALVES" FOR EMERGENCY SHUTOFFS.

2- BUTTERFLY VALVE OPERATORS SHALL BE LOCATED ON THE LEFT-HAND SIDE OF THE VALVE (AT THE TEE OR CROSS), LOOKING THROUGH THE VALVE TOWARD THE PIPE END.

3- WHERE CONCRETE CROSS GUTTERS AT STREET INTERSECTIONS WILL INTERFERE WITH VALVE BOXES, THE PIPELINE SHALL BE MOVED TO A POSITION 7 FEET OFF THE CURB FACE TO CLEAR THE CROSS GUTTER.

4- VALVES TO BE LOCATED ADJACENT TO FITTINGS WHEREVER POSSIBLE.

VALVE & VALVE BOX 2
NTS -

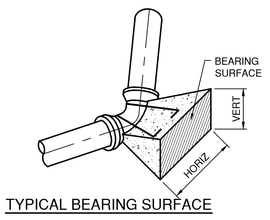


TRENCH SECTION

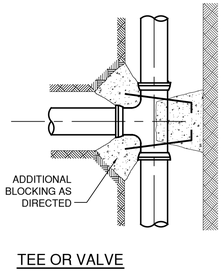
NOTES:

1- FOR PIPE SIZES 4-INCH THROUGH 10-INCH DIAMETER, PIPE BASE SHALL BE A MINIMUM OF 4-INCHES IN DEPTH; FOR 12-INCH DIAMETER PIPE AND LARGER, PIPE SHALL BE A MINIMUM OF 6-INCHES IN DEPTH.
2- 95% COMPACTION OF IMPORTED BACKFILL OR NATIVE BACKFILL AS APPROVED BY ENGINEER
3- 90% COMPACTION OF IMPORTED BACKFILL OR NATIVE BACKFILL AS APPROVED BY ENGINEER
4- MATCH EXISTING PAVEMENT SECTION, MINIMUM 3" AC OVER 6" AB

TYPICAL PIPE TRENCH 3
NTS -



TYPICAL BEARING SURFACE



TEE OR VALVE

MINIMUM SIZE OF THRUST BLOCK BEARING SURFACE

PIPE	11 1/4° BEND	22 1/2° BEND	45° BEND	90° BEND	TEE	END CAP
SIZE	HORIZ. VERT.	HORIZ. VERT.	HORIZ. VERT.	HORIZ. VERT.	HORIZ. VERT.	HORIZ. VERT.
6"	2'-6" 1'-0"	2'-6" 1'-0"	3'-6" 1'-6"	4'-6" 2'-3"	4'-0" 2'-0"	2'-6" 1'-9"

NOTES:

1- THRUST BLOCK BEARING AREA BASED ON ALLOWABLE SOIL BEARING VALUE OF 1500 psf PRESSURE AND 225 psi LINE PRESSURE WITH 3'-0" COVER MINIMUM.
FOR BEARING = 1000 PSF, 1.5 X AREA SHOWN
FOR BEARING = 500 PSF, 3.0 X AREA SHOWN

2- ALL THRUST BLOCKS SHALL BE 2,000 PSI CONCRETE AND PLACED AGAINST UNDISTURBED SOIL. DESIGN ENGINEER SHALL DETERMINE SIZES NOT SHOWN.

3- STRAPS TO BE #4 REBARS EMBEDDED IN THRUST BLOCK TO A DEPTH EQUAL TO 3/4 OF PIPE DIAMETER. STRAP BEND EQUALS 1/2 PIPE DIAMETER

4- CONCRETE SHALL NOT EXTEND ONTO FLANGE OR ADJOINING PIPE.

5- JOINTS AND FACE OF PLUGS TO BE KEPT CLEAR OF CONCRETE

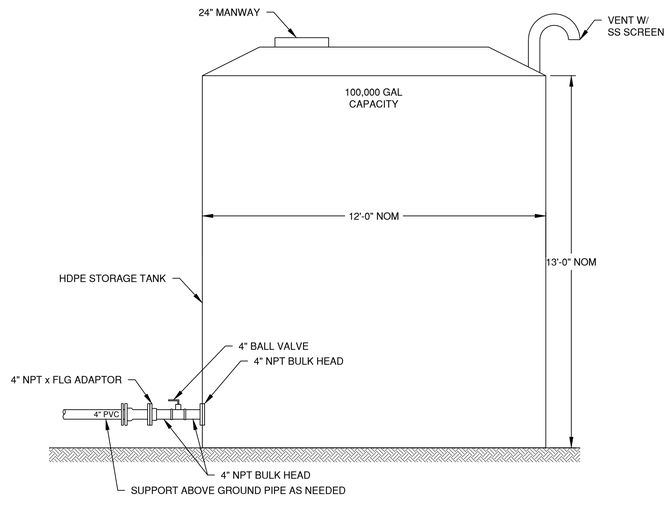
6- WRAP EXPOSED PORTION OF BARS AND 2" INTO CONCRETE WITH HALF LAPPED, 10 MIL PVC TAPE

7- WHEN CLEARANCES TO OTHER FACILITIES OR UTILITIES DO NOT ALLOW THE USE OF THRUST BLOCK, RESTRAINED PIPE SHALL BE USED.

8- THRUST BLOCKS ON CROSSES SHALL BE USED ONLY WHEN THERE IS A STUB-OUT ON ONE OR MORE SIDES, OR WHEN THERE IS ADJOINING UNRESTRAINED LENGTHS OF VALVES.

9- DISTRICT ALLOWS RESTRAINED JOINTS AS AN ALTERNATIVE TO THRUST BLOCKS.

THRUST BLOCK 4
NTS -



TEMPORARY TANK 5
NTS -

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 68703 CIVIL STATE OF CALIFORNIA — IMPROVEMENT PLANS NOT FOR CONSTRUCTION

TANK DETAILS

LOMPICO TANKS REPLACEMENT

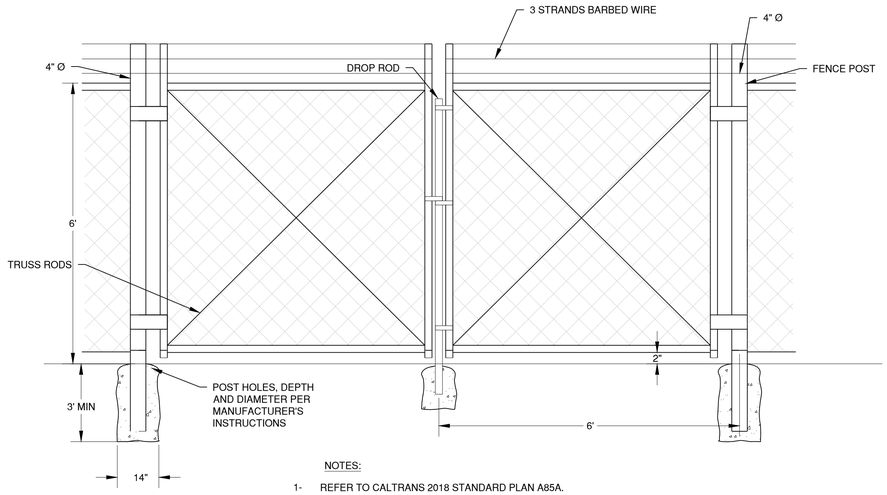
SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	NOT TO SCALE		
SUBMITTAL:	60% SUBMITTAL		

C4.3

SHEET 24 OF 25



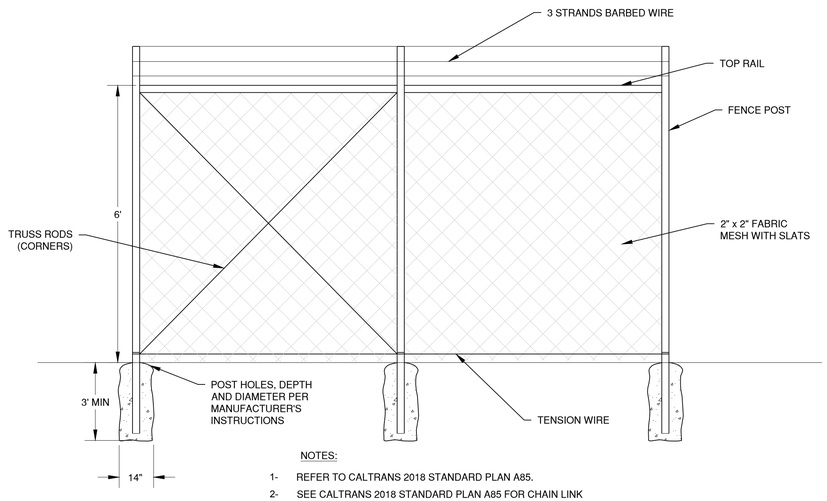
NOTES:

1- REFER TO CALTRANS 2018 STANDARD PLAN A85A.

2- SEE CALTRANS 2018 STANDARD PLAN A85A FOR CHAIN LINK GATE INSTALLATION.

3- ALL FENCE MATERIAL SHALL BE GALVANIZED INCLUDING STRANDS OF BARBWIRE.

SWING GATE 1
NTS -



NOTES:

1- REFER TO CALTRANS 2018 STANDARD PLAN A85.

2- SEE CALTRANS 2018 STANDARD PLAN A85 FOR CHAIN LINK GATE INSTALLATION.

3- SEE CALTRANS 2018 STANDARD PLAN A85A FOR BARBED WIRE POST TOP DETAIL.

4- ALL FENCE MATERIAL SHALL BE GALVANIZED INCLUDING STRANDS OF BARBWIRE.

CHAIN LINK FENCE 2
NTS -

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 87703 CIVIL STATE OF CALIFORNIA
IMPROVEMENT CONSTRUCTION

DETAILS

LOMPICO TANKS REPLACEMENT

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	NOT TO SCALE		
SUBMITTAL:	60% SUBMITTAL		

C4.4

SHEET 25 OF 25

This page left intentionally blank

APPENDIX B

BOTANICAL PLANT LIST

Madrone Tank Site	
Common Name	Scientific Name
American century plant	*Agave americana*
Bristly ox-tongue	*Helminthotheca echioides*
California bay	*Umbellularia californica*
California blackberry	*Rubus ursinus*
California wild rose	*Rosa californica*
Coast live oak	*Quercus agrifolia*
Coast redwood	*Sequoia sempervirens*
Common rush	*Juncus effusus*
Common snowberry	*Symphoricarpos albus*
Douglas fir	*Pseudotsuga menziesii*
French broom	*Genista monspessulana*
Hedge nettle	*Stachys ajugoides*
Tan oak	*Notholithocarpus densiflorus*
Madrone	*Arbutus menziesii*
Poison oak	*Toxicodendron diversilobum*
Scotch broom	*Cytisus scoparius*
Sedge species	*Carex sp.*
Slender oat	*Avena barbata*
Stinging nettle	*Urtica dioica*
Vetch species	*Vicia sp.*

Kaski Tank Site	
Common Name	Scientific Name
American century plant	*Agave americana*
American dogwood	*Cornus sericea*
Big leaf maple	*Acer macrophyllum*
Bristly ox-tongue	*Helminthotheca echioides*
California bay	*Umbellularia californica*
California blackberry	*Rubus ursinus*
California man-root	*Marah fabacea*
Coast live oak	*Quercus agrifolia*
Coast redwood	*Sequoia sempervirens*
Common nightshade	*Solanum americanum*
Common rush	*Juncus effusus*
Common sheep sorrel	*Rumex acetosella*
Common snowberry	*Symphoricarpos albus*
Douglas fir	*Pseudotsuga menziesii*
French broom	*Genista monspessulana*
Hairy cats ear	Hypochaeris radicata

Hedge nettle	*Stachys ajugoides*
Tan oak	Notholithocarpus densiflorus
Madrone	*Arbutus menziesii*
Mole plant	*Euphorbia lathyris*
Poison oak	*Toxicodendron diversilobum*
Scotch broom	*Cytisus scoparius*
Sedge species	*Carex sp.*
Slender oat	*Avena barbata*
Stinging nettle	*Urtica dioica*
Vetch species	*Vicia sp.*
Western sword fern	*Polystichum munitum*

Lewis Tank Site	
Common Name	Scientific Name
American dogwood	*Cornus sericea*
Black sage	*Salvia mellifera*
Bristly ox-tongue	*Helminthotheca echioides*
California bay	*Umbellularia californica*
California blackberry	*Rubus ursinus*
California man-root	*Marah fabacea*
Chamise	*Adenostoma fasciculatum*
Coast live oak	*Quercus agrifolia*
Common groundsel	*Senecio vulgaris*
Common nightshade	*Solanum americanum*
Common rush	*Juncus effusus*
Common sheep sorrel	*Rumex acetosella*
Common snowberry	*Symphoricarpos albus*
Common sow thistle	Sonchus oleraceus
Crane's bill geranium	*Geranium molle*
Deerweed	*Acmispon glaber*
Iceplant	*Carpobrotus edulis*
Jersey cudweed	*Pseudognaphalium luteoalbum*
Lizard tail	*Eriophyllum staechadifolium*
Madrone	*Arbutus menziesii*
Marsh purslane	Ludwigia palustris
Mock heather	*Ericameria ericoides*
Pampas grass	*Cortaderia jubata*
Poison oak	*Toxicodendron diversilobum*
Red stemmed filaree	*Erodium cicutarium*
Ripgut brome	*Bromus diandrus*
Santa Cruz Mountain manzanita	*Arctostaphylos crustacea ssp. crinita*
Scarlet pimpernel	*Lysimachia arvensis*
Sedge species	Carex sp.

Silver bush lupine	*Lupinus albifrons*
Silverleaf manzanita	*Arctostaphylos silvicola*
Slender oat	*Avena barbata*
Slender sedge	*Carex tumulicola*
Smooth cats ear	*Hypochaeris glabra*
Sticky monkeyflower	*Diplacus aurantiacus*
Stinging nettle	*Urtica dioica*
Tall cyperus	*Cyperus eragrostis*
Vetch species	*Vicia sp.*
Western brackenfern	*Pteridium aquilinum*
Yerba santa	*Eriodictyon californicum*

This page left intentionally blank

APPENDIX C

SPECIAL-STATUS SPECIES TABLE

Lompico Tanks Replacement California Natural Diversity Database Occurrence Table
(Felton, Big Basin, Castle Rock Ridge, Los Gatos, Laurel, Soquel, Santa Cruz, and Davenport Quadrangles)

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
MAMMALS			
Antrozous pallidus Pallid bat	-- / CSC / --	Occurs in a wide variety of habitats including grasslands, shrublands, arid desert areas, oak savanna, coastal forested areas, and coniferous forests of the mountain regions of California. Most common in open, dry habitats with rocky areas for roosting. Day roosts include caves, crevices, mines, and occasionally hollow trees and buildings. Seems to prefer rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Similar structures are used for night roosting and will also use more open sites such as eaves, awnings, and open areas under bridges for feeding roosts.	**Unlikely** The survey area has limited open areas and lacks rocky areas for roosting.
Corynorhinus townsendii Townsend's big-eared bat	-- / CSC / --	Found primarily in rural settings from inland deserts to coastal redwoods, oak woodland of the inner Coast Ranges and Sierra foothills, and low to mid-elevation mixed coniferous-deciduous forests. Typically roost during the day in limestone caves, lava tubes, and mines, but can roost in buildings that offer suitable conditions. Night roosts are in more open settings and include bridges, rock crevices, and trees.	**Unlikely** The survey area has limited open areas and lacks rocky areas for roosting.
Dipodomys venustus venustus Santa Cruz kangaroo rat	-- /CNDDB/--	Common permanent residents of chaparral and foothill woodland habitats within the Santa Cruz Mountains from 0-1799 meters. Use well-drained loam or sandy loam soils for burrowing. Burrows are typically shallow (2-20 inches below the surface) and simple with a main chamber and few escape chambers.	**High** Suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1995 and is a nonspecific, possibly extirpated occurrence within the survey area.
Erethizon dorsatum North American porcupine	-- /CNDDB/--	Prefers coniferous and mixed forests; also inhabits riparian zones, grasslands, shrublands, and deserts in some parts of the range. Winter den may be in a rock outcrop, live hollow tree, hollow log, or outbuilding. May shelter in dense conifers in winter.	**Low** Suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1937 within 5 km of survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Lasiurus cinereus hoary bat	-- /CNDDB/--	Prefers open habitats or habitat mosaics with access to trees for cover and open areas or edge for feeding. Generally, roost in dense foliage of trees; does not use buildings for roosting. Winters in California and Mexico and often migrates towards summer quarters in the north and east during the spring. Young are born and reared in summer grounds, which is unlikely to occur in California.	**Unlikely** The survey area has limited open areas for roosting.
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	-- / CSC / --	Forest habitats of moderate canopy with moderate to dense understory. Also occurs in chaparral habitats.	**Present** Numerous woodrat nests were observed throughout and adjacent to the project site.
Neotoma fuscipes annectens American badger	--/CSC/--	Dry, open grasslands, fields, pastures savannas, and mountain meadows near timberline are preferred. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated grounds.	**Low** Suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1983 approximately 8 km of survey area.
BIRDS			
Accipiter cooperii Cooper's hawk	--/ WL /--	Resident throughout most of the wooded portion of the state. Dense stands of live oak, riparian deciduous, or other forest habitats near water used most frequently. Seldom found in areas without dense tree stands, or patchy woodland habitats.	**Moderate** Suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1996 approximately 6 km of survey area.
Agelaius tricolor Tricolored blackbird (nesting colony)	-- / SC&CSC / --	Nest in colonies in dense riparian vegetation, along rivers, lagoons, lakes, and ponds. Forages over grassland or aquatic habitats.	**Unlikely** No suitable habitat within or adjacent to survey area.
Aquila chrysaetos Golden eagle (nesting & wintering)	-- / CFP / --	Use rolling foot-hills, mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, cliffs, and rocky outcrops. Nest in secluded cliffs with overhanging ledges as well as large trees.	**Unlikely** No suitable nesting habitat within or adjacent to survey area.
Ardea herodias Great blue heron	--/CNDDB/--	Occur in areas near water; marshes, swamps, shores, sloughs, and tide flats. (Rookeries protected)	**Unlikely** No suitable nesting habitat within or adjacent to survey area.
Athene cunicularia Burrowing owl (burrow sites & some wintering sites)	-- / CSC / --	Year-round resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Frequent open grasslands and shrublands with perches and burrows. Use rodent burrows (often California ground squirrel) for roosting and nesting cover. Pipes, culverts, and nest boxes may be substituted for burrows in areas where burrows are not available.	**Unlikely** No suitable nesting habitat within or adjacent to survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Brachyramphus marmoratus Marbled murrelet	FT / SE / --	Occur year-round in marine subtidal and pelagic habitats from the Oregon border to Point Sal. Partial to coastlines with stands of mature redwood and Douglas-fir. Requires dense mature forests of redwood and/or Douglas-fir for breeding and nesting.	**Low** Suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 2001 approximately 4 km of survey area.
Charadrius alexandrinus nivosus Western snowy plover (nesting)	FT / CSC / --	Sandy beaches on marine and estuarine shores, also salt pond levees and the shores of large alkali lakes. Requires sandy, gravelly or friable soil substrate for nesting.	**Unlikely** No suitable habitat within or adjacent to survey area.
Coturnicops noveboracensis yellow rail	-- / CSC / --	Wet meadows and coastal tidal marshes. Occurs year round in California, but in two primary seasonal roles: as a very local breeder in the northeastern interior and as a winter visitor (early Oct to mid-Apr) on the coast and in the Suisun Marsh region	**Unlikely** No suitable habitat within or adjacent to survey area.
Cypseloides niger black swift	-- /CSC/--	Coastal belt of Santa Cruz and Monterey counties; central & southern Sierra Nevada; San Bernardino & San Jacinto mountains.	**Unlikely** No suitable habitat within or adjacent to survey area.
Elanus leucurus White-tailed kite	-- / CFP / --	Open groves, river valleys, marshes, and grasslands. Prefer such area with low roosts (fences etc.). Nest in shrubs and trees adjacent to grasslands.	**Unlikely** No suitable habitat within or adjacent to survey area.
Falco peregrinus anatum American peregrine falcon (nesting)	-- / CFP / --	Forages for other birds over a variety of habitats. Breeds primarily on rocky cliffs.	**Unlikely** No suitable habitat within or adjacent to survey area.
Geothlypis trichas sinuosa saltmarsh common yellowthroat	-- / CSC / --	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.	**Unlikely** No suitable habitat within or adjacent to survey area.
Laterallus jamaicensis coturniculus California black rail	-- / ST&CFP / --	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that does not fluctuate during the year & dense vegetation for nesting habitat.	**Unlikely** No suitable habitat within or adjacent to survey area.
Pandion haliaetus osprey	--/CNDDB/--	Ocean shore, bays, freshwater lakes, and larger streams.	**Unlikely** No suitable habitat within or adjacent to survey area.
Progne subis purple martin	--/CSC/--	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine.	**Low** No suitable habitat within survey area. Closest CNDDB occurrence is from 2014 approximately 13 km of survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Riparia riparia bank swallow	--/ST/--	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	**Unlikely** No suitable habitat within or adjacent to survey area.
REPTILES AND AMPHIBIANS			
Ambystoma californiense California tiger salamander	FT / ST /--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Need underground refuges and vernal pools or other seasonal water sources.	**Unlikely** No suitable habitat within or adjacent to survey area. No vernal pools or seasonal water sources within or adjacent to survey area.
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	FE / SE&CFP / --	Wet meadows near sea level in a few restricted locales in Santa Cruz and Monterey counties.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation for this species and lacks wet meadows near sea level.
Aneides flavipunctatus niger Santa Cruz black salamander	-- / CSC /--	Endemic to California. Occurs in the fog belt of the outer Coastal Range in mesic forests. This species occurs in moist streamside microhabitats. This species is often found in shallow standing water or seeps. Small geographical range consisting of woodland habitat within the Santa Cruz Mountains in western Santa Clara, northern Santa Cruz, and southernmost San Mateo Counties.	**Low** Suitable habitat does not exist within or adjacent to survey area, no streams or permanent water exist within the survey area. Known occurrences surround the survey area, the closest CNDDB occurrence is a historical occurrence from 1973 approximately .5 km from the survey area.
Dicamptodon ensatus California giant salamander	-- / CSC / --	Endemic to California. Occurs within the Coast Range from just north of the southern border of Mendocino County to southern Santa Cruz County. Found in wet coastal forests in or around clear, cold permanent and semi-permanent streams and seepages. Typically within elevations ranging from sea level to approximately 3000 feet.	**Low** Suitable habitat does not exist within or adjacent to survey area, no streams run within the survey area. Known occurrences surround the survey area, the closest CNDDB occurrence is a historical nonspecific occurrence from 1952 within the survey area.
Emys marmorata Western pond turtle (includes *E. m. pallida* and *E. m. marmorata* as recognized by the Department)	-- / CSC / --	Associated with permanent or nearly permanent water in a wide variety of habitats including streams, lakes, ponds, irrigation ditches, etc. Require basking sites such as partially submerged logs, rocks, mats of vegetation, or open banks.	**Unlikely** No suitable habitat within or adjacent to survey area. Site lacks permanent or nearly permanent water source.
Rana boylii foothill yellow-legged frog	-- / SC&CSC / --	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats, including hardwood, pine, and riparian forests, scrub, chaparral, and wet meadows. Rarely encountered far from permanent water.	**Low** Suitable habitat does not exist within or adjacent to survey area, no permanent water resources within the survey area. Known occurrences surround the survey area, however the closest CNDDB occurrence is a historical nonspecific occurrence from 1930 within the survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Rana draytonii California red-legged frog	FT / CSC / --	Lowlands and foothills in or near permanent or late-season sources of deep water with dense, shrubby, or emergent riparian vegetation. During late summer or fall adults are known to utilize a variety of upland habitats with leaf litter or mammal burrows.	**Low** Suitable habitat does not exist within or adjacent to survey area, no permanent water exists within the survey area. Historical sightings approximately 3 km from survey area.
FISH			
Eucyclogobius newberryi tidewater goby	FE / CSC / --	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	**Unlikely** No suitable habitat within survey area.
Oncorhynchus kisutch pop. 4 coho salmon – central California ESU	FE / SE / --	Federal listing = pops between Punta Gorda & San Lorenzo River. State listing = pops south of Punta Gorda.	**Unlikely** No suitable habitat within survey area.
Oncorhynchus mykiss irideus Steelhead (Central California Coast DPS)	FT / -- / --	Coastal perennial and near perennial streams, with suitable spawning and rearing habitat and no major barriers.	**Unlikely** No suitable habitat within survey area.
Thaleichthys pacificus Eulachon	FT / -- / --	Found in Klamath River, Mad River, Redwood Creek, and in small numbers in Smith River and Humboldt Bay tributaries.	**Unlikely** No suitable habitat within survey area.
INVERTEBRATES			
Adela oplerella Opler's longhorn moth	-- / CNDDB/ --	Occur in dry, nutrient-poor, serpentine soil grasslands of the greater San Francisco Bay area and adjacent foothills and valleys. Adults fly, mate, and lay their eggs between mid-March and late April; this timing varies depending on the weather. Eggs are deposited directly into the unopened flowers of the host plant, California cream cups (*Platystemon californicus*). The adult host plant is not known, though it appears that the adults may feed on the nectar of California cream cups and other native herbaceous species. Dispersal distance is typically 50 meters.	**Unlikely** No suitable habitat within or adjacent to survey area. Suitable soil not found within or adjacent to survey area. No known sightings of host plant within or adjacent to survey area.
Bombus caliginosus Obscure bumble bee	-- / CNDDB / --	Native to the West Coast of the United States. Occurs primarily along the coast in grassy prairies and meadows within the Coast Range. This species can nest both under and above ground. When nesting above ground the species may utilize abandoned bird nests. Found in areas that are relatively humid including areas that are frequently foggy.	**Low** Moderately suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1956 approximately 2.7 km of survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Bombus occidentalis Western bumble bee	-- / CNDDB / --	Occurs in open grassy areas, urban parks, urban gardens, chaparral, and meadows. This species generally nests underground.	**Low** Moderately suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1944 approximately .5 km of survey area.
Cicindela hirticollis gravida Sandy beach tiger beetle	-- / CNDDB / --	Found in moist sand near the ocean, for example in swales behind dunes or upper beaches beyond normal high tides.	**Unlikely** No suitable habitat within or adjacent to survey area.
Cincindela ohlone Ohlone tiger beetle	FE / -- / --	Coastal terraces with remnant stands of open native grassland with clay or sandy soils. Hunt, breed, and dig small vertical burrows along sunny single-track trails and dirt roads (maintained by cattle, hikers, etc.) in coast terrace meadows that still support native grasses. Current range from the City of Scotts Valley to the eastern edge of the City of Santa Cruz.	**Unlikely** No suitable habitat within or adjacent to survey area.
Coelus globosus globose dune beetle	-- / CNDDB / --	Coastal dunes. These beetles are primarily subterranean, tunneling through sand underneath dune vegetation.	**Unlikely** No suitable habitat within or adjacent to survey area.
Danaus plexippus pop. 1 monarch - California overwintering population	-- / CNDDB / --	Overwinters in coastal California using colonial roosts generally found in Eucalyptus, pine and acacia trees. Overwintering habitat for this species within the Coastal Zone represents ESHA. Local ordinances often protect this species as well.	**Unlikely** No suitable habitat within or adjacent to survey area.
Euhilotes enoptes smithi Smith's blue butterfly	FE / -- / --	Most commonly associated with coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz Counties. Plant hosts are *Eriogonum latifolium* and *E. parvifolium*.	**Unlikely** No suitable habitat within or adjacent to survey area.
Lytta moesta Moestan blister beetle	-- / CNDDB / --	Found on the flowers and foliage of certain plants.	**Unlikely** No suitable habitat within or adjacent to survey area.
Philanthus nasalis Antioch specid wasp	-- / CNDDB / --	Inland marine sand hills. Originally known to occur in the Antioch Dunes, Contra Costa County; however, have not been collected there since 1959. Identified in 1991 in the Zayante and Ben Lomond sandhills.	**Low** No suitable habitat is present within the survey area. The closest CNDDB occurrence is a historical occurrence from 1993 approximately 3 km of survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Polyphylla barbata Mount Hermon (barbate) June beetle	FE / -- / --	Ponderosa pine-chaparral habitat with sandy soil and open, sparsely vegetated areas. May also occur in more vegetated areas of chaparral. While not always present, silver-leaved manzanita is often an indicator of suitable habitat. Restricted to the Zayante sandhills habitat of the Ben Lomond-Mount Harmon-Scotts Valley area.	**High** Suitable habitat within and adjacent to survey area. The closest CNDDB occurrence from 2006 approximately 1.7 km of survey area..
Speyeria adiaste adiaste unsilvered fritillary	-- / CNDDB / --	Restricted to Central Coast Region of California. This species is thought to be restricted to the higher elevations of the Santa Cruz Mountains in San Mateo, Santa Cruz, and Santa Clara Counties. Inhabits openings in conifer and redwood forests, as well as oak woodlands, chaparral, and grassy slopes. Violets (*Viola* spp.) are the only known host plants. North American violets can support larval growth, but some of the European ornamental violets are toxic to most *Speyeria* species. The distribution of host plants limits the extent of available habitat.	**Low** Suitable habitat within survey area. The closest CNDDB occurrence is a historical occurrence from 1992 approximately 15 km of survey area.
Trimerotropis infantilis Zayante band-winged grasshopper	FE / -- / --	Isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem)	**Unlikely** No suitable habitat within or adjacent to survey area. The closest CNDDB occurrence is from 2005 approximately 1.1 km away from survey area within the Quail Hollow Ecological Reserve.
PLANTS			
Agrostis blasdalei Blasdale's bent grass	--/--/1B	Coastal bluff scrub, coastal dunes, and coastal prairie at elevations from 0-150 meters. Perennial rhizomatous herb in the Poaceae family. Blooms May–July.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation for this species.
Amsinckia lunaris Bent-flowered fiddleneck	-- / -- / 1B	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland at elevations of 3-500 meters. Annual herb in the Boraginaceae family; blooms March-June.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Anomobryum julaceum Slender silver moss	-- / -- / 4	Damp rock and soil on outcrops; usually on roadcuts. Broadleaved upland forest, lower montane coniferous forest, and North Coast coniferous forest at elevations of 100-1000 meters. Moss in the Bryaceae family.	**Unlikely** No suitable habitat within and adjacent to survey area.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Arctostaphylos andersonii Anderson's manzanita	-- / -- / 1B	Openings and edges of broadleaved upland forest, chaparral, and north coast coniferous forest at elevations of 60-760 meters. Evergreen shrub in the Ericaceae family; blooms November-May.	**Not Present** Suitable habitat within and adjacent to survey area, however not observed during focused plant survey. Historical sightings within 2 km of survey area.
Arctostaphylos glutinosa Schreiber's manzanita	-- / -- / 1B	Broadleaved upland forest, chaparral, and north coast coniferous forest on granitic or sandstone souls at elevations between 170-685 meters. Perennial evergreen shrub in the Ericaceae family; blooms November-April.	**Not Present** This species was not observed during focused rare plant surveys conducted at the appropriate blooming period.
Arctostaphylos ohloneana Ohlone manzanita	-- / -- / 1B	Closed-cone coniferous forest and coastal scrub within siliceous shale, at elevations between 450-530 meters. Evergreen shrub in the Ericaceae family; blooms February-March.	**Not Present** This species was not observed during focused rare plant surveys conducted at the appropriate blooming period.
Arctostaphylos regismontana Kings Mountain manzanita	-- / -- / 1B	Broadleaved upland forest, chaparral, and north coast coniferous forest on granitic or sandstone soils at elevations between 305-730 meters. Evergreen shrub in the Ericaceae family; blooms January-April.	**Not Present** This species was not observed during focused rare plant surveys conducted at the appropriate blooming period.
Arctostaphylos silvicola Silverleaf manzanita	-- / -- / 1B	Chaparral, closed-cone coniferous forest, and lower montane coniferous forest on inland marine sands at elevations of 120-600 meters. Evergreen shrub in the Ericaceae family; blooms February-March.	**Present** This species was observed during focused rare plant surveys conducted at the appropriate blooming period.
Calyptridium parryi var. hesseae Santa Cruz Mountains pussypaws	-- / -- / 1B	Sandy or gravelly openings of chaparral and cismontane woodlands at elevations of 305-1530 meters. Annual herb in the Montiaceae family; blooms May-August.	**Not Present** This species was not observed during focused rare plant surveys conducted at the appropriate blooming period.
Campanula californica Swamp harebell	-- / -- / 1B	Mesic areas of bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, freshwater marshes and swamps, and North Coast coniferous forest at elevations of 1-405 meters. Perennial rhizomatous herb in the Campanulaceae family; blooms June-October.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Carex comosa Bristly sedge	-- / -- / 1B	Coastal prairie, marshes and swamps on lake margins, and valley and foothill grassland at elevations of 0-625 meters. Perennial rhizomatous herb in the Cyperaceae family; blooms May-September.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Carex saliniformis Deceiving sedge	-- / -- / 1B	Mesic areas of coastal prairie, coastal scrub, meadows and seeps, and coastal salt marshes and swamps at elevations of 3-230 meters. Perennial rhizomatous herb in the Cyperaceae family; blooms June-July.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation range for this species. Focused rare plant surveys were conducted outside the appropriate blooming period.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	-- / -- / 1B	Valley and foothill grassland on heavy clay, saline, or alkaline soils at elevations of 0-230 meters. Annual herb in the Asteraceae family; blooms May-November.	**Unlikely** No suitable habitat within or adjacent to survey area. Required soils not found within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Chorizanthe pungens var. *hartwegiana* Ben Lomond spineflower	FE / -- / 1B	Lower montane coniferous forest (maritime ponderosa pine sandhills) at elevations of 90-610 meters. Annual herb in the Polygonaceae family; blooms April-July.	**Present** This species was observed during focused rare plant surveys conducted at the appropriate blooming period.
Chorizanthe pungens var. *pungens* Monterey spineflower	FT / -- / 1B	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland on sandy soils at elevations of 3-450 meters. Annual herb in the Polygonaceae family; blooms April-July.	**Unlikely** Low suitability habitat within and adjacent to survey area. Historical sightings over 20 km from survey area.
Chorizanthe robusta var. *robusta* Robust spineflower	FE / -- / 1B	Openings in cismontane woodland, coastal dunes, maritime chaparral, and coastal scrub on sandy or gravelly soils at elevations of 3-300 meters. Annual herb in the Polygonaceae family; blooms April-September.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Cirsium fontinale var. campylon Mount Hamilton fountain thistle	-- / -- / 1B	Chaparral, cismontane woodland, and valley and foothill grassland on serpentinite seeps, at elevations of 100-890 meters. Perennial herb in the Asteraceae family; blooms February-October.	**Unlikely** No suitable habitat within or adjacent to survey area. Appropriate soils not found within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Clarkia concinna ssp. automixa Santa Clara red ribbons	-- / -- / 4	Chaparral and cismontane woodlands at elevations of 90-1500 meters. Annual herb in the Onagraceae family; blooms April-July.	**Not Present** This species was not observed during focused rare plant surveys conducted at the appropriate blooming period.
Collinsia multicolor San Francisco collinsia	-- / -- / 1B	Closed-cone coniferous forest and coastal scrub, sometimes on serpentinite soils, at elevations of 30-250 meters. Annual herb in the Plantaginaceae family; blooms March-May.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation range for this species. Focused rare plant surveys were conducted outside the appropriate blooming period.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Dacryophyllum falcifolium Tear drop moss	-- / -- / 1B	North coast coniferous forests on carbonate soils at elevations of 50-275 meters. Known only in Monterey and Santa Cruz counties.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation range for this species.
Dudleya abramsii ssp. setchellii Santa Clara Valley dudleya	-- / -- / 1B	Cismontane woodland and valley and foothill grasslands on rocky serpentinite soils, at elevations of 60-455 meters. Perennial herb in the Crassulaceae family; blooms April-October.	**Unlikely** No suitable habitat within or adjacent to survey area. Required soils not found within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Eriogonum nudum var. decurrens Ben Lomond buckwheat	-- / -- / 1B	Chaparral, cismontane woodland, and lower montane coniferous forest (maritime ponderosa pine sandhills) on sandy soils, at elevations of 50-800 meters. Perennial herb in the Polygonaceae family; blooms June-October.	**Present** This species was observed during focused rare plant surveys conducted at the appropriate blooming period.
Erysimum teretifolium Santa Cruz wallflower	FE / SE / 1B	Chaparral and lower montane coniferous forest on inland marine sands, at elevations of 120-610 meters. Perennial herb in the Brassicaceae family; blooms March-July.	**Not Present** This species was not observed during focused rare plant surveys conducted at the appropriate blooming period.
Fissidens pauperculus Minute pocket moss	-- / -- / 1B	North coast coniferous forest on damp coastal soil at elevations of 10-1024 meters. Moss in the Fissidentaceae family.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Fritillaria liliacea Fragrant fritillary	-- / -- / 1B	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, often serpentinite, at elevations of 3-410 meters. Bulbiferous perennial herb in the Liliaceae family; blooms February-April.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Grimmia torenii Toren's grimmia	-- / CNDDB / 1B	Endemic to California. Occurrences are known from Lake, Mendocino, Contra Costa, and Santa Cruz Counties. Found in the Coast Range at elevations of 325 to 1160 meters. Occurs on pillow basalts and some sand stones. Often serpentine soil occurs in areas occupied by this species. A moss in the Gimmiaceae family.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Grimmia vaginulata Vaginulate grimmia	-- / CNDDB / 1B	Believed to be extremely rare. So far, most occurrences have been found on the vertical or underhanging surfaces of calcareous sandstone boulders created from the bedrock of the Butano Formation. The boulders with occurrences of this species were located in dense chaparral at elevations of approximately 700 meters. A moss in the Gimmiaceae family.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Hesperocyparis abramsiana var. *abramsiana* Santa Cruz cypress	FE / SE / 1B	Closed-cone coniferous forest, chaparral, and lower montane coniferous forest on sandstone or granitic soils at elevations of 280-800 meters. Evergreen tree in the Cupressaceae family.	**Not Present** Species not found during focused botanical surveys. Focused rare plant surveys were conducted outside the appropriate blooming period.
Hesperocyparis abramsiana var. *butanoensis* Butano Ridge cypress	-- / CNDDB / 1B	Only known from the Butano Ridge of the Santa Cruz Mountains. Occurs on sandstone in closed-cone coniferous forest, chaparral, and lower montane coniferous forest habitats. Elevation range of 400-490 meters. Evergreen tree in the Cupressaceae family.	**Not Present** Species not found during focused botanical surveys. Focused rare plant surveys were conducted outside the appropriate blooming period.
Hoita strobilina Loma Prieta hoita	-- / -- / 1B	Mesic areas of chaparral, cismontane woodland, and riparian woodland, usually on serpentinite soils, at elevations of 30-860 meters. Perennial herb in the Fabaceae family; blooms May-October.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Holocarpha macradenia Santa Cruz tarplant	FT / SE / 1B	Coastal prairies and valley foothill grasslands often clay or sandy soils, at elevations of 10-220 meters. Annual herb in the Asteraceae family; blooms June-October.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Horkelia cuneata ssp. sericea Kellogg's horkelia	-- / -- / 1B.1	Openings of closed-cone coniferous forests, maritime chaparral, coastal dunes, and coastal scrub on sandy or gravelly soils at elevations of 10-200 meters. Perennial herb in the Rosaceae family; blooms April-September.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Horkelia marinensis Point Reyes horkelia	-- / -- / 1B	Coastal dunes, coastal prairie, and coastal scrub on sandy soils at elevations of 5-350 meters. Perennial herb in the Rosaceae family; blooms May-September.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Lasthenia californica ssp. macrantha Perennial goldfields	-- / -- / 1B	Coastal bluff scrub, coastal dunes, and coastal scrub at an elevation of 5-520 meters. Perennial herb in the Asteraceae family. Blooms January – November.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Lessingia micradenia var. glabrata Smooth lessingia	-- / -- / 1B	Chaparral and cismontane woodlands on serpentinite soils, often on roadsides, at elevations of 120-420 meters. Annual herb in the Asteraceae family; blooms July-November.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Malacothamnus arcuatus Arcuate bush-mallow	-- / -- / 1B	Chaparral and cismontane woodland at elevations of 15-355 meters. Perennial evergreen shrub in the Malvaceae family; blooms April-September.	**Low** Suitable habitat within and adjacent to survey area is inadequate. Focused rare plant surveys were conducted outside the appropriate blooming period.
Microseris paludosa Marsh microseris	-- / -- /1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations of 5-300 meters. Perennial herb in the Asteraceae family; blooms April-July.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Mielichhoferia elongata Elongate copper moss	-- / -- / 4	Cismontane woodland.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Monardella sinuata ssp. nigrescens Northern curly-leaved monardella	-- / -- /1B	Chaparral, coastal dunes, coastal scrub, and lower montane coniferous forest (ponderosa pine sandhills) on sandy soils at elevations of 0-300 meters. Annual herb in the Lamiaceae family; blooms April-September.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Monolopia gracilens Woodland monolopia	-- / -- / 1B	Openings of broadleaved upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland on serpentinite soils at elevations of 100-1200 meters. Annual herb in the Asteraceae family; blooms February-July.	**Moderate** Suitable habitat within and adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Orthotrichum kellmanii Kellman's Bristle Moss	--/--/1B	Sandstone, carbonate in Chaparral or Cismontane woodland. Blooms January-February. 343-685 meters.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Pedicularis dudleyi Dudley's lousewort	-- / SR / 1B	Maritime chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland at elevations of 60-900 meters. Perennial herb in the Orbanchaceae family; blooms April-June.	**Low** Suitable habitat within and adjacent to survey area is inadequate. Focused rare plant surveys were conducted outside the appropriate blooming period.
Penstemon rattanii var. kleei Santa Cruz Mountains beardtongue	-- / -- / 1B	Chaparral and lower montane and North Coast coniferous forests at elevations of 400-1100 meters. Perennial herb in the Plantaginaceae family; blooms May-June.	**Unlikely** Suitable habitat within and adjacent to survey area. Site is located out of suitable elevation range for this species. Focused rare plant surveys were conducted outside the appropriate blooming period.
Pentachaeta bellidiflora White-rayed pentachaeta	FE / SE / 1B	Cismontane woodland and valley and foothill grasslands, often on serpentinite soils, at elevations of 35-620 meters. Annual herb in the Asteraceae family; blooms March-May.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Pinus radiata Monterey pine	-- / -- / 1B	Closed-cone coniferous forest and cismontane woodland at elevations of 25-185 meters. Evergreen tree in the Pinaceae family. Only three native stands in CA at Ano Nuevo, Cambria, and the Monterey Peninsula; introduced in many areas.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation range for this species. Focused rare plant surveys were conducted outside the appropriate blooming period.
Piperia candida White-flowered rein orchid	-- / -- / 1B	Broadleaved upland forest, lower montane coniferous forest, and North Coast coniferous forest, sometimes on serpentinite soils, at elevations of 30-1310 meters. Perennial herb in the Orchidaceae family; blooms May-September.	**Unlikely** No suitable habitat within and adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Plagiobothrys chorisianus var. chorisianus Choris' popcorn-flower	-- / -- / 1B	Mesic areas of chaparral, coastal prairie, and coastal scrub at elevations of 15-160 meters. Annual herb in the Boraginaceae family; blooms March-June.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation range for this species. Focused rare plant surveys were conducted outside the appropriate blooming period.
Plagiobothrys diffusus San Francisco popcorn-flower	-- / SE / 1B	Coastal prairie and valley and foothill grassland at elevations of 60-360 meters. Annual herb in the Boraginaceae family; blooms March-June.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Plagiobothrys glaber Hairless popcorn-flower	-- / -- / 1A	Alkaline meadows and seeps, and coastal salt marshes and swamps at elevations of 15-180 meters. Annual herb in the Boraginaceae family; blooms March-May.	**Unlikely** No suitable habitat within or adjacent to survey area. Site is located out of suitable elevation range for this species.

Species	Status (Service/ Department/CNPS)	General Habitat	Potential Occurrence within Project Vicinity
Polygonum hickmanii Scotts Valley polygonum	FE / SE / 1B	Valley and foothill grassland on mudstone and sandstone at elevations of 210-250 meters. Annual herb in the Polygonaceae family; blooms: May-August.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Senecio aphanactis Chaparral ragwort	-- / -- / 2B	Chaparral, cismontane woodland, and coastal scrub, sometimes on alkaline soils, at elevations of 15-800 acres. Annual herb in the Asteraceae family; blooms January-April.	**Low** Suitable habitat within and adjacent to survey area is inadequate. Focused rare plant surveys were conducted outside the appropriate blooming period.
Sidalcea malachroides Maple-leaved checkerbloom	-- / -- / 4	Broadleaved upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, and riparian woodlands, often in disturbed areas, at elevations of 2-730 meters. Perennial herb in the Malvaceae family; blooms March-August.	**Low** Suitable habitat found within and adjacent to survey area inadequate. Focused rare plant surveys were conducted outside the appropriate blooming period.
Stebbinsoseris decipiens Santa Cruz microseris	-- / -- / 1B	Broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and openings in valley and foothill grassland, sometimes on serpentinite, at elevations of 10-500 meters. Annual herb in the Asteraceae family; blooms April-May.	**Low** Suitable habitat within and adjacent to survey area inadequate. Focused rare plant surveys were conducted outside the appropriate blooming period.
Streptanthus albidus ssp. peramoenus Most beautiful jewel-flower	-- / -- / 1B	Chaparral, cismontane woodlands, and valley and foothill grasslands on serpentinite soils at elevations of 94-1000 meters. Annual herb in the Brassicaceae family; blooms March-October.	**Unlikely** No suitable habitat within or adjacent to survey area. Focused rare plant surveys were conducted outside the appropriate blooming period.
Trifolium buckwestiorum Santa Cruz clover	-- / -- / 1B	Gravelly margins of broadleaved upland forest, cismontane woodland, and coastal prairie at elevations of 105-610 meters. Annual herb in the Fabaceae family; blooms April-October.	**Low** Suitable habitat within or adjacent to survey area inadequate. Focused rare plant surveys were conducted outside the appropriate blooming period.

STATUS DEFINITIONS

Federal

FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FC = Candidate for listing under the federal Endangered Species Act
-- = no listing

State

SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SR = listed as Rare under the California Endangered Species Act
SC = Candidate for listing under the California Endangered Species Act
CSC = California Department of Fish and Wildlife Species of Concern
CFP = California Fully Protected Animal
WL = CDFW Watch List
CNDDB = This designation is being assigned to animal species with no other status designation defined in this table. These animal species are included in the Department's CNDDB "Special Animals" list (2010), which includes all taxa the CNDDB is interested in tracking, regardless of their legal or protection status. This list is also referred to as the list of "species at risk" or "special-status species." The Department considers the taxa on this list to be those of the greatest conservation need.
-- = no listing

California Native Plant Society

1B = List 1B species; rare, threatened or endangered in California and elsewhere
List 4 = Limited distribution (CNPS Watch List)
-- = no listing

POTENTIAL TO OCCUR

Present = known occurrence of species within the site; presence of suitable habitat conditions; or observed during field surveys
High = known occurrence of species in the vicinity from the CNDDB or other documentation; presence of suitable habitat conditions
Moderate = known occurrence of species in the vicinity from the CNDDB or other documentation; presence of marginal habitat conditions within the site
Low = species known to occur in the vicinity from the CNDDB or other documentation; lack of suitable habitat or poor quality
Unlikely = species not known to occur in the vicinity from the CNDDB or other documentation, no suitable habitat is present within the site
Not Present = species was not observed during surveys

APPENDIX D

CNDDB OCCURRENCE REPORT

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Felton (3712211) OR Big Basin (3712222) OR Castle Rock Ridge (3712221) OR Los Gatos (3712128) OR Laurel (3712118) OR Soquel (3612188) OR Santa Cruz (3612281) OR Davenport (3712212))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Adela oplerella Opler's longhorn moth	IILEE0G040	None	None	G2	S2	
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
Agrostis blasdalei Blasdale's bent grass	PMPOA04060	None	None	G2	S2	1B.2
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	AAAAA01082	Endangered	Endangered	G5T1T2	S1S2	FP
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
Aneides flavipunctatus niger Santa Cruz black salamander	AAAAD01070	None	None	G3	S3	SSC
Anomobryum julaceum slender silver moss	NBMUS80010	None	None	G5?	S2	4.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos andersonii Anderson's manzanita	PDERI04030	None	None	G2	S2	1B.2
Arctostaphylos glutinosa Schreiber's manzanita	PDERI040G0	None	None	G1	S1	1B.2
Arctostaphylos ohloneana Ohlone manzanita	PDERI042Y0	None	None	G1	S1	1B.1
Arctostaphylos regismontana Kings Mountain manzanita	PDERI041C0	None	None	G2	S2	1B.2
Arctostaphylos silvicola Bonny Doon manzanita	PDERI041F0	None	None	G1	S1	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Arenaria paludicola marsh sandwort	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Brachyramphus marmoratus marbled murrelet	ABNNN06010	Threatened	Endangered	G3G4	S1	
Calasellus californicus An isopod	ICMAL34010	None	None	G2	S2	
Calyptridium parryi var. hesseae Santa Cruz Mountains pussypaws	PDPOR09052	None	None	G3G4T2	S2	1B.1
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Carex saliniformis deceiving sedge	PMCYP03BY0	None	None	G2	S2	1B.2
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T2	S2	1B.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
Chorizanthe pungens var. hartwegiana Ben Lomond spineflower	PDPGN040M1	Endangered	None	G2T1	S1	1B.1
Chorizanthe pungens var. pungens Monterey spineflower	PDPGN040M2	Threatened	None	G2T2	S2	1B.2
Chorizanthe robusta var. hartwegii Scotts Valley spineflower	PDPGN040Q1	Endangered	None	G2T1	S1	1B.1
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S2	
Cicindela ohlone Ohlone tiger beetle	IICOL026L0	Endangered	None	G1	S1	
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Cirsium fontinale var. campylon Mt. Hamilton fountain thistle	PDAST2E163	None	None	G2T2	S2	1B.2
Clarkia concinna ssp. automixa Santa Clara red ribbons	PDONA050A1	None	None	G5?T3	S3	4.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Cypseloides niger black swift	ABNUA01010	None	None	G4	S2	SSC
Dacryophyllum falcifolium tear drop moss	NBMUS8Z010	None	None	G2	S2	1B.3
Danaus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	None	None	G4T2T3	S2S3	
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
Dipodomys venustus venustus Santa Cruz kangaroo rat	AMAFD03042	None	None	G4T1	S1	
Dudleya abramsii ssp. setchellii Santa Clara Valley dudleya	PDCRA040Z0	Endangered	None	G4T2	S2	1B.1
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eriogonum nudum var. decurrens Ben Lomond buckwheat	PDPGN08492	None	None	G5T1	S1	1B.1
Erysimum teretifolium Santa Cruz wallflower	PDBRA160N0	Endangered	Endangered	G1	S1	1B.1
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Euphilotes enoptes smithi Smith's blue butterfly	IILEPG2026	Endangered	None	G5T1T2	S1S2	
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fissidens pauperculus minute pocket moss	NBMUS2W0U0	None	None	G3?	S2	1B.2
Fissilicreagris imperialis Empire Cave pseudoscorpion	ILARAE5010	None	None	G1	S1	
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Grimmia torenii Toren's grimmia	NBMUS32330	None	None	G2	S2	1B.3
Grimmia vaginulata vaginulate grimmia	NBMUS32340	None	None	G2G3	S1	1B.1
Hesperevax sparsiflora var. brevifolia short-leaved evax	PDASTE5011	None	None	G4T3	S2	1B.2
Hesperocyparis abramsiana var. abramsiana Santa Cruz cypress	PGCUP04081	Threatened	Endangered	G1T1	S1	1B.2
Hesperocyparis abramsiana var. butanoensis Butano Ridge cypress	PGCUP04082	Threatened	Endangered	G1T1	S1	1B.2
Hoita strobilina Loma Prieta hoita	PDFAB5Z030	None	None	G2?	S2?	1B.1
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T1?	S1?	1B.1
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Lessingia micradenia var. glabrata smooth lessingia	PDAST5S062	None	None	G2T2	S2	1B.2
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta moesta moestan blister beetle	IICOL4C020	None	None	G2	S2	
Malacothamnus arcuatus arcuate bush-mallow	PDMAL0Q0E0	None	None	G2Q	S2	1B.2
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Maritime Coast Range Ponderosa Pine Forest Maritime Coast Range Ponderosa Pine Forest	CTT84132CA	None	None	G1	S1.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Melospiza melodia pusillula	ABPBXA301S	None	None	G5T2?	S2S3	SSC
Alameda song sparrow						
Meta dolloff	ILARA17010	None	None	G1	S1	
Dolloff Cave spider						
Microseris paludosa	PDAST6E0D0	None	None	G2	S2	1B.2
marsh microseris						
Mielichhoferia elongata	NBMUS4Q022	None	None	G5	S4	4.3
elongate copper moss						
Monardella sinuata ssp. nigrescens	PDLAM18162	None	None	G3T2	S2	1B.2
northern curly-leaved monardella						
Monolopia gracilens	PDAST6G010	None	None	G3	S3	1B.2
woodland woollythreads						
Monterey Pine Forest	CTT83130CA	None	None	G1	S1.1	
Monterey Pine Forest						
N. Central Coast Calif. Roach/Stickleback/Steelhead Stream	CARA2633CA	None	None	GNR	SNR	
N. Central Coast Calif. Roach/Stickleback/Steelhead Stream						
Neochthonius imperialis	ILARAD1010	None	None	G1	S1	
Empire Cave pseudoscorpion						
Neotoma fuscipes annectens	AMAFF08082	None	None	G5T2T3	S2S3	SSC
San Francisco dusky-footed woodrat						
North Central Coast Drainage Sacramento Sucker/Roach River	CARA2623CA	None	None	GNR	SNR	
North Central Coast Drainage Sacramento Sucker/Roach River						
North Central Coast Short-Run Coho Stream	CARA2632CA	None	None	GNR	SNR	
North Central Coast Short-Run Coho Stream						
Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Coastal Salt Marsh						
Northern Interior Cypress Forest	CTT83220CA	None	None	G2	S2.2	
Northern Interior Cypress Forest						
Northern Maritime Chaparral	CTT37C10CA	None	None	G1	S1.2	
Northern Maritime Chaparral						
Oncorhynchus kisutch pop. 4	AFCHA02034	Endangered	Endangered	G4	S2?	
coho salmon - central California coast ESU						
Oncorhynchus mykiss irideus pop. 8	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
steelhead - central California coast DPS						
Orthotrichum kellmanii	NBMUS56190	None	None	G2	S2	1B.2
Kellman's bristle moss						
Pandion haliaetus	ABNKC01010	None	None	G5	S4	WL
osprey						
Pedicularis dudleyi	PDSCR1K0D0	None	Rare	G2	S2	1B.2
Dudley's lousewort						

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Penstemon rattanii var. kleei Santa Cruz Mountains beardtongue	PDSCR1L5B1	None	None	G4T2	S2	1B.2
Pentachaeta bellidiflora white-rayed pentachaeta	PDAST6X030	Endangered	Endangered	G1	S1	1B.1
Philanthus nasalis Antioch specid wasp	IIHYM20010	None	None	G1	S1	
Pinus radiata Monterey pine	PGPIN040V0	None	None	G1	S1	1B.1
Piperia candida white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	PDBOR0V061	None	None	G3T1Q	S1	1B.2
Plagiobothrys diffusus San Francisco popcornflower	PDBOR0V080	None	Endangered	G1Q	S1	1B.1
Plagiobothrys glaber hairless popcornflower	PDBOR0V0B0	None	None	GH	SH	1A
Polygonum hickmanii Scotts Valley polygonum	PDPGN0L310	Endangered	Endangered	G1	S1	1B.1
Polygonum marinense Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
Polyphylla barbata Mount Hermon (=barbate) June beetle	IICOL68030	Endangered	None	G1	S1	
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G5T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Rynchops niger black skimmer	ABNNM14010	None	None	G5	S2	SSC
Sanicula maritima adobe sanicle	PDAPI1Z0D0	None	Rare	G2	S2	1B.1
Scapanus latimanus parvus Alameda Island mole	AMABB02031	None	None	G5THQ	SH	SSC
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
Sorex vagrans halicoetes salt-marsh wandering shrew	AMABA01071	None	None	G5T1	S1	SSC
Spergularia macrotheca var. longistyla long-styled sand-spurrey	PDCAR0W062	None	None	G5T2	S2	1B.2
Speyeria adiaste adiaste unsilvered fritillary	IILEPJ6143	None	None	G1G2T1	S1	
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Stebbinsoseris decipiens Santa Cruz microseris	PDAST6E050	None	None	G2	S2	1B.2
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
Streptanthus albidus ssp. peramoenus most beautiful jewelflower	PDBRA2G012	None	None	G2T2	S2	1B.2
Stygobromus mackenziei Mackenzie's Cave amphipod	ICMAL05530	None	None	G1	S1	
Suaeda californica California seablite	PDCHE0P020	Endangered	None	G1	S1	1B.1
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thaleichthys pacificus eulachon	AFCHB04010	Threatened	None	G5	S3	
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Trimerotropis infantilis Zayante band-winged grasshopper	IIORT36030	Endangered	None	G1	S1	
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2

Record Count: 140

This page left intentionally blank

APPENDIX E

IPaC RESOURCES LIST FOR THE SURVEY AREAS

IPaC **U.S. Fish & Wildlife Service**

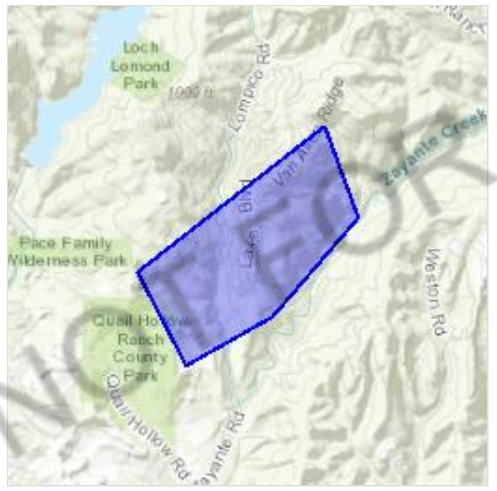
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Santa Cruz County, California



Local office

Ventura Fish And Wildlife Office

(805) 644-1766
(805) 644-3958

2493 Portola Road, Suite B
Ventura, CA 93003-7726

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS

California Least Tern Sterna antillarum browni — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8104

Least Bell's Vireo Vireo bellii pusillus — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/5945

Marbled Murrelet Brachyramphus marmoratus — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/4467

Southwestern Willow Flycatcher Empidonax traillii extimus — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/6749

Reptiles

NAME	STATUS
San Francisco Garter Snake Thamnophis sirtalis tetrataenia No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Tidewater Goby Eucyclogobius newberryi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Mount Hermon June Beetle Polyphylla barbata No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3982	Endangered
Ohlone Tiger Beetle Cicindela ohlone No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8271	Endangered
Smith's Blue Butterfly Euphilotes enoptes smithi There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4418	Endangered
Zayante Band-winged Grasshopper Trimerotropis infantilis There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/1036	Endangered

Flowering Plants

NAME	STATUS
Ben Lomond Spineflower Chorizanthe pungens var. hartwegiana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7498	Endangered
Ben Lomond Wallflower Erysimum teretifolium No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7429	Endangered
Marsh Sandwort Arenaria paludicola No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2229	Endangered
Menzies' Wallflower Erysimum menziesii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2935	Endangered
Santa Cruz Tarplant Holocarpha macradenia There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6832	Threatened

Scotts Valley Polygonum Polygonum hickmanii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3222	Endangered
Scotts Valley Spineflower Chorizanthe robusta var. hartwegii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7108	Endangered

Conifers and Cycads

NAME	STATUS
Santa Cruz Cypress Cupressus abramsiana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1678	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Zayante Band-winged Grasshopper Trimerotropis infantilis https://ecos.fws.gov/ecp/species/1036#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

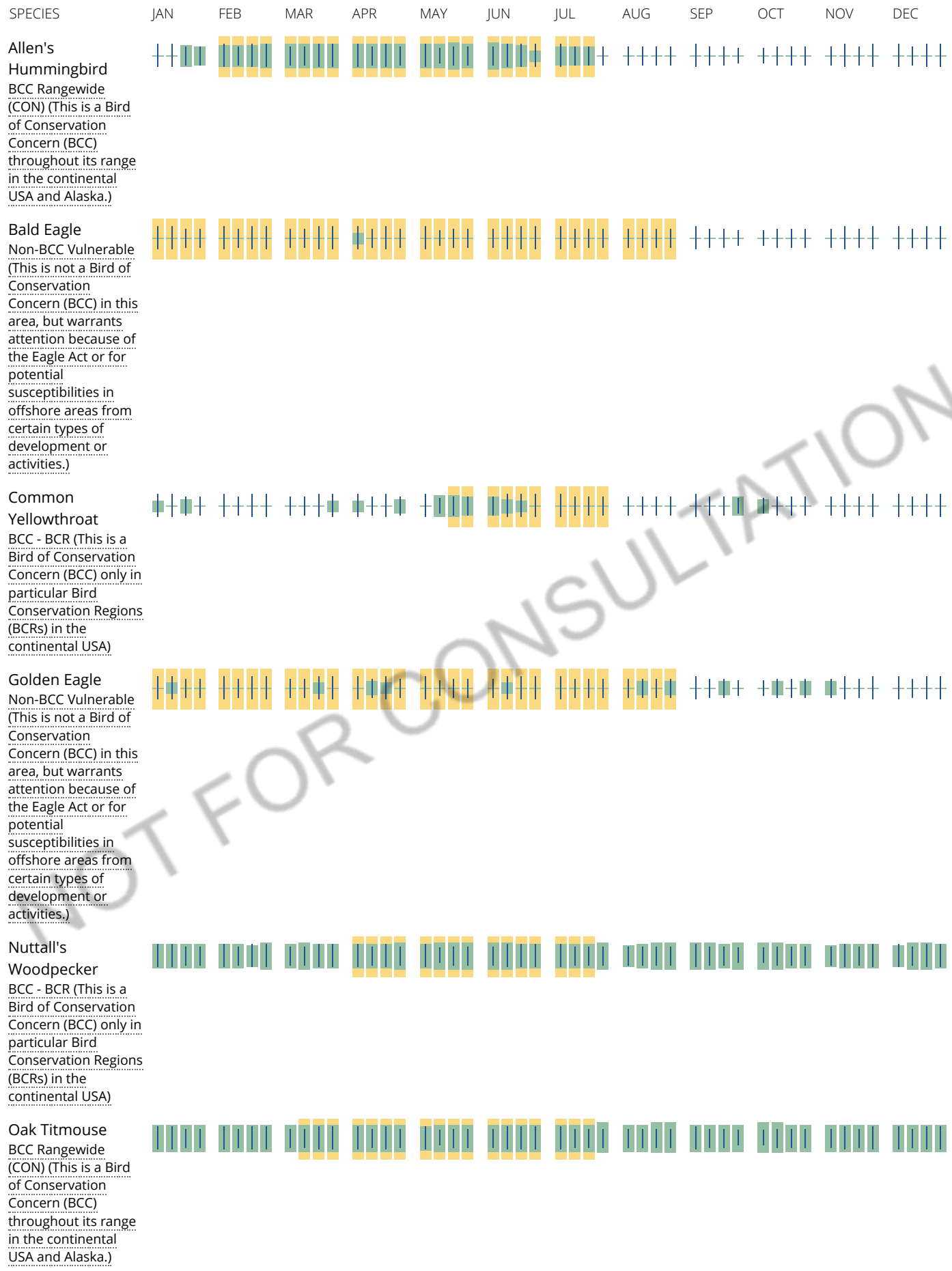
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data



Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Song Sparrow
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Spotted Towhee
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Tricolored Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wrentit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project

intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

R3UBH
R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX F

EMERGENCY ENDANGERED SPECIES ACT CONSULTATION FOR THE SAN LORENZO VALLEY WATER DISTRICT LEWIS TANK SITE

Denise Duffy & Associates, Inc.
PLANNING AND ENVIRONMENTAL CONSULTING

MEMORANDUM

Date: July 9, 2019

To: Chad Mitcham, United States Fish and Wildlife Service (Service)

cc: Rick Rodgers, San Lorenzo Valley Water District (District)
Jen Michelsen, (District)
Jodi McGraw, Jodi McGraw Consulting (JMc)

From: Matt Johnson, Denise Duffy & Associates, Inc. (DD&A)

Subject: Emergency Endangered Species Act Consultation for the San Lorenzo Valley Water District Lewis Tank Site

INTRODUCTION

Denise Duffy & Associates, Inc. (DD&A) was contracted by San Lorenzo Valley Water District (District) to prepare CEQA documentation for the Lompico Tanks Replacement Project. The District proposes to replace aging water storage tanks at three distinct locations (Kaski, Madrone, and Lewis) with modern water storage tanks. Site improvements include the installation of two (2) 40,000-gallon steel bolted water storage tanks at the Kaski tank site and two (2) 75,000-gallon tanks at the Madrone tank site, to replace the existing redwood water storage tanks. At the Lewis tank site, improvements include installation of two (2) 110,000-gallon steel bolted water storage tanks to replace an existing 100,000-gallon redwood water storage tank (Attachment A, Schaaf and Wheeler 2019).

DD&A was informed through email by the District on June 12, 2019 that the Lewis tank had begun to leak excessively. The District employed divers to repair the tank, however they determined that the tank will soon fail. To ensure water storage and availability for the residents that rely on the Lompico Tanks infrastructure (which includes Lewis tank), the District proposes to install temporary storage tanks, as soon as possible. The temporary storage tanks were proposed for use during the demolition and construction of the new storage system as part of the Lompico Tanks Replacement Project; however, due to the current state of the Lewis tank, the District desires to install them prior to the completion of the CEQA review process and other related regulatory permit requirements. The temporary tanks and associated infrastructure, shown in the attached site plans, will be placed north of the existing Lewis tank site fence line. the District and their design team considered the following alternatives for temporary tank placement before deciding on the current location:

1. Inside the Lewis tank site existing fence line,
2. outside the Lewis tank site existing fence line between West Ave and the north fence, and
3. a nearby District lot (APN 075-321-02), which was the old Lewis tank #1 site.

The proposed temporary tank location (Option 2) was determined to be the least impactful and most efficient option. The off-site location (Option 3) would require grading and pipe installation that would impact a larger footprint of suitable habitat for Mount Hermon June beetle (MHJB, *Polyphylla barbata*), a federally Endangered species. There is an existing Pressure Release Valve (PRV) vault adjacent to the onsite location so ground disturbance for temporary piping would be reduced when compared to the off-site option. Additionally, the proposed off-site location has not been utilized by the District in approximately 20 years and vegetation removal would be extensive. Option 1, placing the temporary tanks within the existing fence line, was dismissed because the replacement of the

Lewis redwood tank will involve removing and regrading everything inside the existing fence line, so temporary tanks installed inside the existing fence would eventually be relocated outside the fence. Additionally, the site north of the fence is approximately 5-feet higher in elevation than the area inside the fence; the elevation reduces the change in system water pressure.

The District requested that DD&A evaluate the Lewis tank site for potential impacts that may occur to federally listed species during the installation of temporary tanks. Presented below is an evaluation of the Lewis tank site and potential impacts to federally listed species and/or suitable habitat that may occur during temporary tank installation, as well as the completion of the proposed tank replacement project. This memorandum is specific to the Lewis tank project site (survey area**,** Figure 1). Habitat for federally listed species was not documented at the Madrone or Kaski tank sites. According to the 60% design plans for the Lewis tank, the project consists of demolition of all existing facilities within the fence line at the Lewis tank project site, over-excavation and grading within the existing fence line, temporary tank storage outside the existing fence line north of the project site, replacement of the existing tank with two (2) new tanks, and use of the existing access road.

RESULTS

DD&A performed a biological investigation of the Lewis tank site as a component of the CEQA review process. Prior to the field investigation, DD&A reviewed existing technical documents including: *Biological Assessment for Lewis Tank #1, near 10011 West Drive Felton, CA (APNs: 075-311-06)* (Attachment B, McGraw Consulting 2016). The McGraw Biological Assessment determined that:

> "*Other than in the areas covered by impervious surfaces, including the tank, shed, and other infrastructure, the project parcel and access road have the potential to support the Mount Hermon June beetle…*" (Page 2, Paragraph 6)

DD&A's field investigation, conducted on December 14, 2018, concurred with the findings of the McGraw Biological Assessment, that suitable habitat for MHJB, is present at the project site. Two[1] vegetation types were observed within the Lewis tank survey area: silverleaf manzanita (*Arctostaphylos silvicola*) chaparral and ruderal/disturbed (Figure 2). The ruderal/disturbed habitat, which covers the area within and immediately surrounding the existing fence line, is dominated by herbaceous plants including primarily exotic annual grasses and forbs including; redstem filaree (*Erodium cicutarium*), rattail fescue (*Festuca myuros*), smooth cat's ears (*Hypochaeris glabra*), and ripgut brome (*Bromus diandrus*). The area surrounding the Lewis tank site is occupied by silverleaf manzanita chaparral, a plant community found within the sandhills ecosystem on Zayante soils in central Santa Cruz County (McGraw Consulting 2016). Shrubs within the Lewis tank site include silverleaf manzanita (Arctostaphylos silvicola) deer weed (*Acmispon glaber*), silver bush lupine (*Lupinus albifrons var. albifrons*), and yerba santa (*Eriodictyon californicum*). Zayante soils, present within both habitat types, represents suitable habitat for MHJB. However, the areas within and immediately surrounding the fence line are relatively degraded due to the dominance of non-native invasive plant species and disturbance attributed to the operations of the tank site.

DD&A mapped all habitats and features, including impervious surfaces, using a Trimble Geo 7 Series GPS unit. The data was then post-processed, transferred to shapefile format, and analyzed using ArcGIS 10.6. Figure 3 displays the survey area and identifies the total suitable habitat for MHJB within the survey area. DD&A overlaid the 60% design plans to identify potential impacts, both permanent and temporary, resulting from the proposed tank replacement. It was determined that approximately 0.76-acre (33,465.08 square feet [ft^2]) of suitable MHJB habitat

[1] A third classification for ground cover was also observed; developed. This ground cover type consists of the existing water supply infrastructure and other impervious areas (cement/pavement).

exists within the survey area. Approximately 0.17-acre (7,262.98 ft^2) of this habitat will be permanently impacted[2] by the tank replacement and approximately 0.16-acre (7,061.70 ft^2) of this habitat will be temporarily[3] impacted by the temporary tanks/staging/other construction activities. Installation of the temporary storage tanks will temporarily impact approximately 0.05-acre (2,259.70 ft^2) of suitable MHJB habitat[4].

DD&A conducted an additional site visit on May 2, 2019 to determine presence/absence of several special-status plant species with the potential to occur at the project site. DD&A documented a population of Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*), a federally Endangered species, within the survey area (Figure 4). DD&A recorded the population with the following methodology; when an occurrence was five (5) plants or less it was recorded as a point, occurrences totaling greater than five (5) individuals were mapped as polygons. The results of this survey effort are shown in Figure 4. DD&A recorded nine (9) polygons totaling approximately 645 ft^2 and 5 points, totaling 7 individuals, within the survey area. Installation of the temporary storage tanks will temporarily impact Ben Lomond spineflower populations with an area totaling approximately 415 ft^2. Implementation of the tank replacement project will impact an additional 35 ft^2 (total impact of 450 ft^2) of Ben Lomond spineflower and one individual Ben Lomond spineflower.

RECOMMENDATIONS

The installation of the temporary tanks and the completion of the tank replacement project will result in temporary and permanent impacts to MHJB suitable habitat and Ben Lomond spineflower populations. DD&A and the District discussed the potential impacts to listed species during a conference call with United States Fish and Wildlife Service (Service) on June 3, 2019. The Service requested that DD&A identify avoidance and minimization measures to reduce the potential for the project to impact MHJB individuals and habitat. Measures are included below to avoid or minimize these potential impacts to the greatest extent possible. At the request of the Service, the following measures were adapted from the *Low-Effect Habitat Conservation Plan for the San Lorenzo Valley Water District's Probation Tank Replacement Project* (McGraw Consulting 2017) and the *Final Mitigated Negative Declaration and Response to Comments Received Probation Tank Replacement Project* (District 2017).

To avoid and minimize impacts to special status plant species, the District will implement the following avoidance and minimization measures (A&MMs):

A&MM 1. Prior to construction, implement a construction fencing plan that demarcates construction access routes and staging areas such that inadvertent impacts to special-status plant species are avoided. Install construction fencing prior to work and maintain fencing throughout the construction period.

A&MM 2. During the summer prior to construction, if possible, a qualified biologist will collect seed of all the Ben Lomond spineflower plants from within the project impact area, for use in restoration (see RM 3).

A&MM 3. For all mapped Ben Lomond spineflower populations that cannot be avoided during installation of the temporary storage tanks or implementation of the larger tank replacement project, and have already desiccated beyond the ability to collect seed, topsoil shall be salvaged for use in restoration efforts, post-project.

a) Topsoil (top 6-8 inches) will be carefully removed by an experienced operator using a dragline, excavator, scraper, or dozer and will be stockpiled in uncompacted piles less than 4 feet tall.

[2] Due to soil disturbance and compactions all areas within the existing fence line will be permanently impacted.

[3] Areas outside of the existing fence line will be restored, therefore impacts are considered temporary.

[4] This temporary impact is included in the total temporary impacts in the preceding statement, not in addition to.

Stockpiled soils will be placed on top of an impervious surface, such as a tarp, within temporary disturbance areas. Topsoil stockpiles will be stabilized by spraying with a tackifier (soil stabilizer) or covered with a permeable natural material, such as jute or coconut fiber blankets, as consistent with SWPPP requirements. To minimize compaction, no equipment will be allowed to travel over or park on the salvaged soil stockpiles (see RM 3).

b) Areas within the existing fence line of the Lewis tank site are dominated by non-native invasive plant species. To reduce the potential for these species to cultivate new areas, this measure does not apply to Ben Lomond spineflower populations within the existing fence line of the Lewis tanks site.

To avoid or minimize impacts to MHJB, the District will implement the following A&MMs:

A&MM 4. Prior to construction, implement a construction fencing plan that demarcates construction access routes and staging areas such that inadvertent impacts to suitable habitat for MHJB are avoided. Install construction fencing prior to work and maintain fencing throughout the construction period.

A&MM 5. The District will salvage the soil within the approximately 0.11-acre area proposed for use by the temporary tanks that has not already been salvaged for Ben Lomond spineflower restoration (A&MM 3). Topsoil (top 6-8 inches) will be carefully removed by an experienced operator using a dragline, excavator, scraper, or dozer and will be stockpiled in uncompacted piles less than 4 feet tall. Stockpiled soils will be placed on top of an impervious surface, such as a tarp, within temporary disturbance areas. Topsoil stockpiles will be stabilized by spraying with a tackifier (soil stabilizer) or covered with a permeable natural material, such as jute or coconut fiber blankets, as consistent with SWPPP requirements. To minimize compaction, no equipment will be allowed to travel over or park on the salvaged soil stockpiles (see RM 3).

A&MM 6. Implement Worker Environmental Awareness Training: A qualified biologist will conduct training sessions to familiarize all construction personnel with the following: identification of MHJB, other protected wildlife and plants, as well as their habitat, general provisions and protections afforded by the Endangered Species Act (ESA), measures implemented to protect the species, penalties for violation of the ESA, reporting requirements, and a review of project footprint boundaries. the District and/or their contractor(s) will require all construction employees to participate in the training prior to working on-site.

A&MM 7. If ground disturbing activities are conducted during the flight season of the MHJB, cover exposed soil nightly to avoid impacts to dispersing males. Adult male Mount Hermon June beetles actively search for mates and breed during the evenings for approximately 12-14 weeks between May 1 and August 30. During this period, males and females may burrow into duff and soils at relatively shallow depths for protection during the daytime hours. Every attempt will be made to conduct soil disturbing aspects of the project outside of the adult flight season (May to August). If construction occurs during any part of the flight season, tarps or other impervious material will be used to cover open soil each night by 7:00 p.m. This will prevent adult males from burrowing into the exposed area and then being impacted by subsequent soil disturbance (digging, grading, or covering).

A&MM 8. A qualified biologist will be on site during all ground-disturbing activities to capture any MHJB observed in the construction areas and relocate them outside to intact sandhills habitat that supports appropriate soils and vegetation.

To provide compensation for impacts to Ben Lomond spineflower plants/seedbank and MHJB suitable habitat the District will implement the following restoration measures (RM):

RM 1. To quantify the incidental take at the end of the project, a qualified biologist will calculate the area of soil disturbance (and thus incidental take) and count the number of MHJB that were observed during tank installation.

RM 2. To compensate for impacts to MHJB habitat impacts at the Lewis tank site the District will set aside 28,850.64 ft^2 (0.67-acre) of habitat within the 6.7-acre conservation area at the Olympia Wellfield. Setting aside 21,788.94 ft^2 (0.51-acre) of habitat within the conservation area will offset the permanent habitat loss at a 3:1 ratio, which is appropriate given the moderate quality of habitat at the site. The temporary impacts of this project will be compensated for at a 1:1 ratio, which reflects the fact that the habitat to be impacted on site will be restored following the project. Prior to initiation of ground-disturbing activities associated with the project, the District will contribute $94,918.61 to the endowment that it will use to manage and monitor the 6.7-acre conservation area (Table 1).

Table 1. Endowment Contribution for the Lewis Tank Replacement Project

Project Component	Habitat Impacts	Area of Impact		Mitigation Ratio	Area of Mitigation		Endowment Contribution	
		Area (ac)	Area (ft^2)		Area (ac)	Area (ft^2)	Per Square Foot	Total
Lewis Tank Replacement	Permanent	0.17	7,262.98	3:1	0.51	21,788.94	$3.29	$71,685.61
Temporary Tank	Temporary	0.11	4,802.00	1:1	0.11	4,802.00	$3.29	$15,798.58
Staging/Construction Easement	Temporary	0.05	2,259.70	1:1	0.05	2,259.70	$3.29	$7,434.41
TOTAL		**0.33**	**14,324.68**		**0.67**	**28,850.64**		**$94,918.61**

RM 3. Following completion of the project, the District will restore the estimated 0.08-acre area of temporary disturbance that is outside of the existing fence line and access road, at the Lewis tank site. Restoration activities will occur for three years, to enable native plant regeneration to occur. The restoration is anticipated to include dispersal of any site-collected Ben Lomond spineflower seed and salvaged topsoil (A&MM 3 and 5) into the non-road portions of the temporary disturbance area.

The District will work with a qualified biologist to develop a more detailed proposal for review by the Service that outlines the specific habitat restoration and monitoring activities. The proposal will also include updating the Sandhills Projects database that the District created to help the Service and others track Sandhills conservation and mitigation projects, to include this and other sandhills conservation and mitigation projects that have been conducted since the database was created and submitted to the Service in 2014.

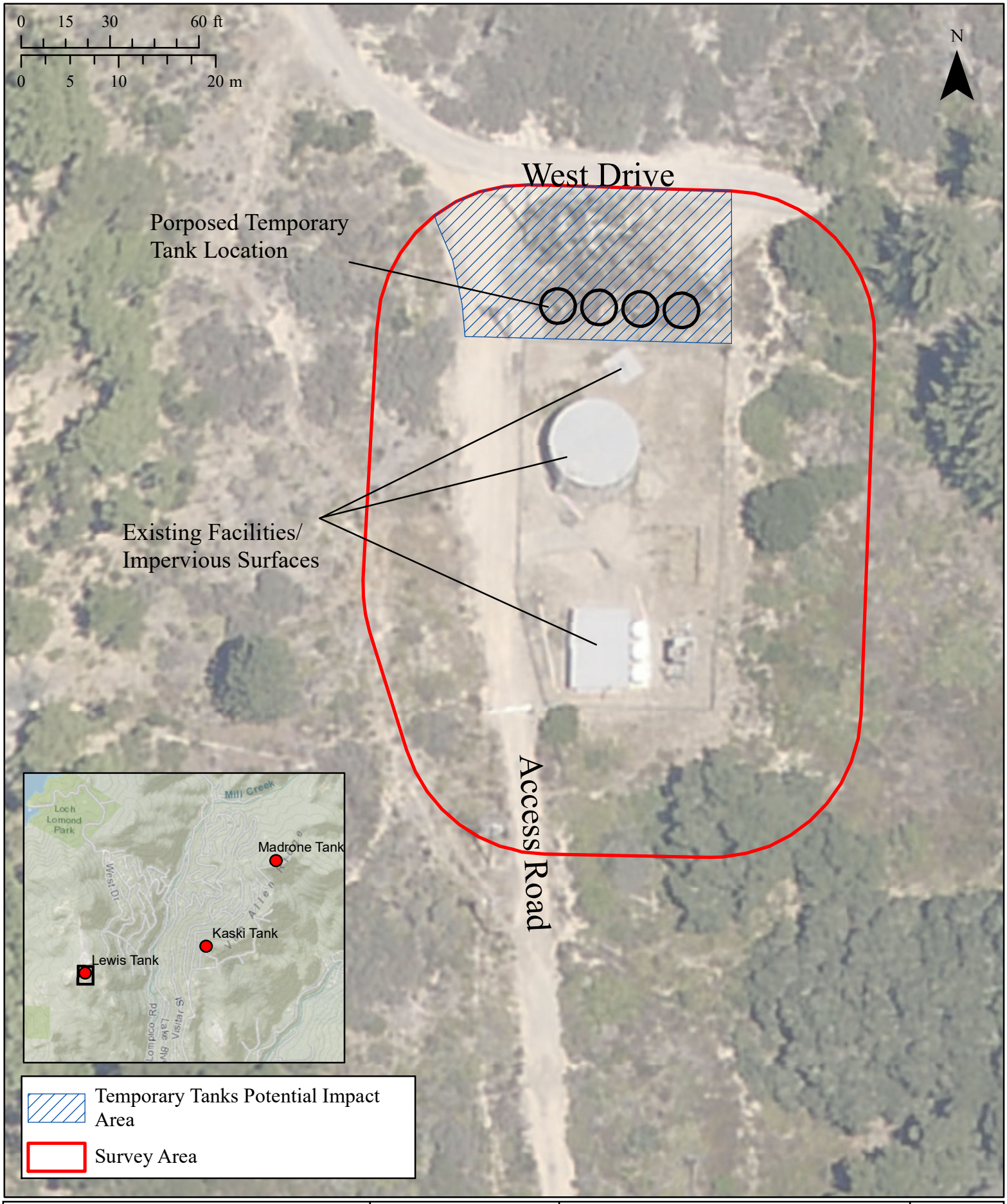
It is our professional opinion that implementation of these measures would minimize potential impacts to MHJB and Ben Lomond spineflower.

REFERENCES

McGraw Consulting. 2016. Biological Assessment for Lewis Tank #1, near 10011 West Drive Felton, CA (APNs: 075-311-06)

McGraw Consulting. 2017. Low-Effect Habitat Conservation Plan for the San Lorenzo Valley Water District's Probation Tank Replacement Project.

San Lorenzo Valley Water District. 2017. Final Mitigated Negative Declaration and Response to Comments Received Probation Tank Replacement Project.



Lewis Tank Survey Area

Date: 6/27/2019
Scale: 1 in = 40 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

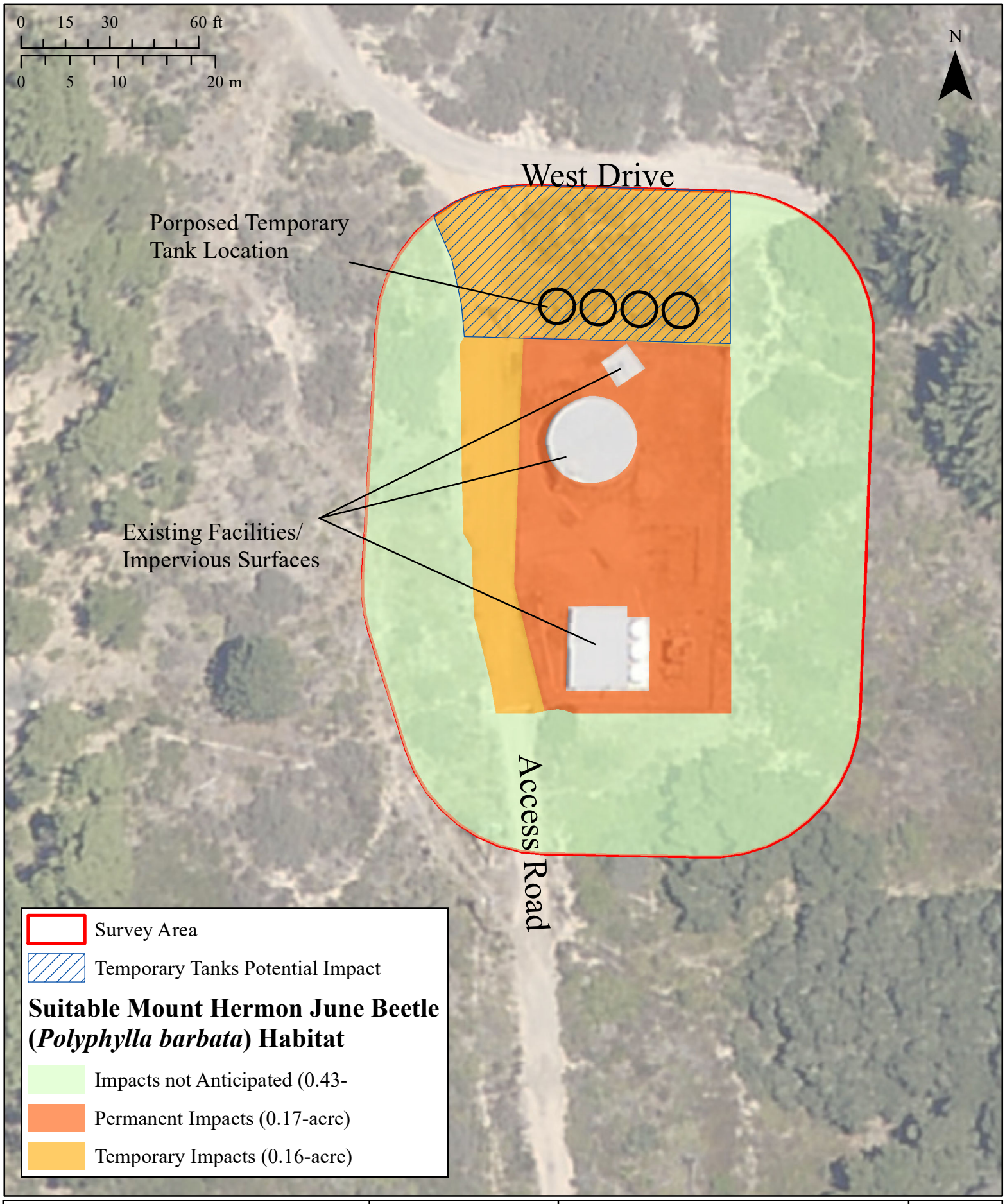
Figure 1

Lewis Tank Site Vegetation Map

Date: 6/28/2019
Scale: 1 in = 40 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 2

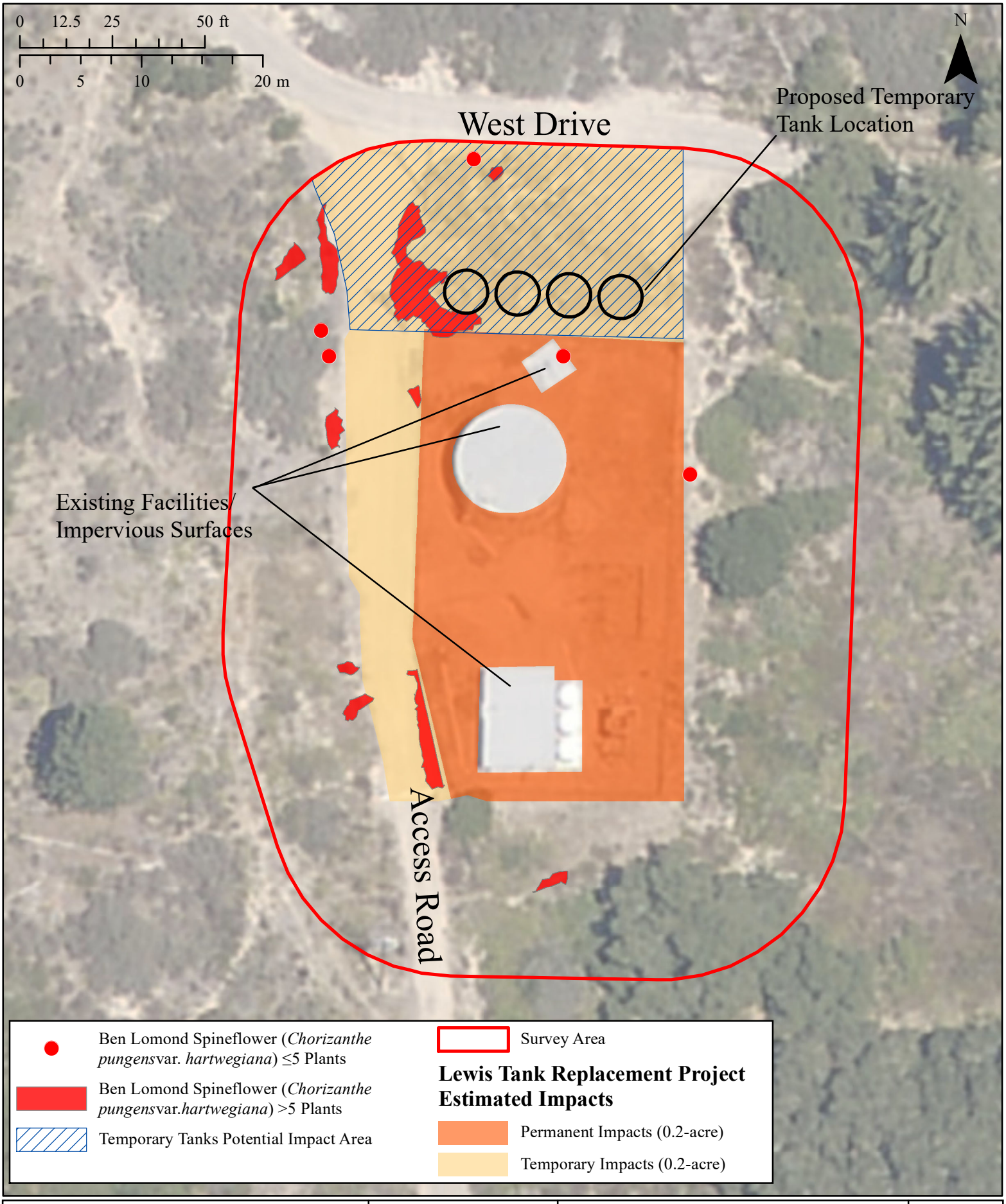


Potential Impacts to Suitable Mount Hermon June Beetle Habitat

Date: 7/9/2019
Scale: 1 in = 40 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 3



Ben Lomond Spineflower Lewis Tank Site

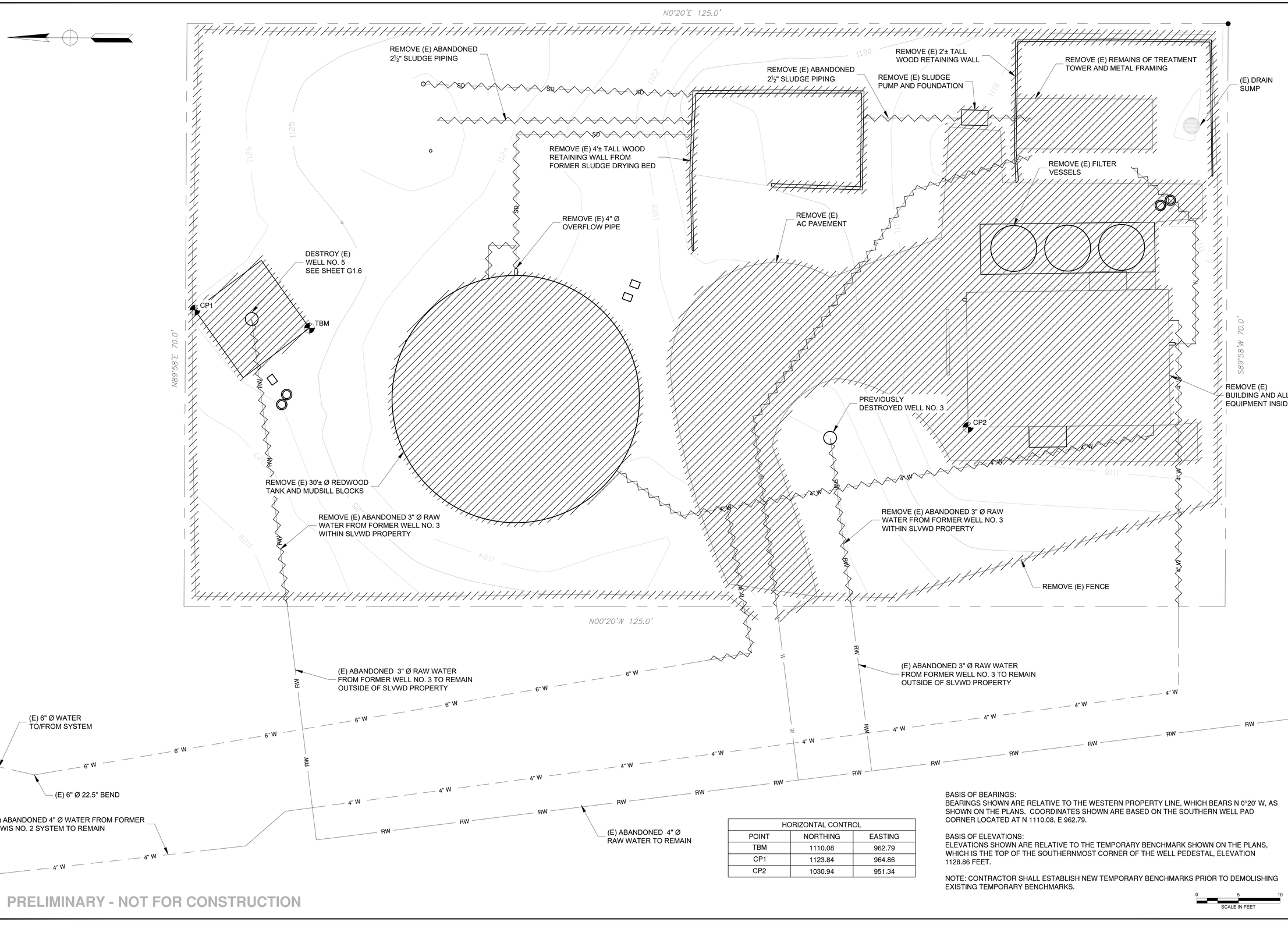
Date: 6/28/2019
Scale: 1 in = 30 ft
Project: 2018.62

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 4

Attachment A.

Lewis Tank Site Plans



HORIZONTAL CONTROL		
POINT	NORTHING	EASTING
TBM	1110.08	962.79
CP1	1123.84	964.86
CP2	1030.94	951.34

BASIS OF BEARINGS:
BEARINGS SHOWN ARE RELATIVE TO THE WESTERN PROPERTY LINE, WHICH BEARS N 0°20' W, AS SHOWN ON THE PLANS. COORDINATES SHOWN ARE BASED ON THE SOUTHERN WELL PAD CORNER LOCATED AT N 1110.08, E 962.79.

BASIS OF ELEVATIONS:
ELEVATIONS SHOWN ARE RELATIVE TO THE TEMPORARY BENCHMARK SHOWN ON THE PLANS, WHICH IS THE TOP OF THE SOUTHERNMOST CORNER OF THE WELL PEDESTAL, ELEVATION 1128.86 FEET.

NOTE: CONTRACTOR SHALL ESTABLISH NEW TEMPORARY BENCHMARKS PRIOR TO DEMOLISHING EXISTING TEMPORARY BENCHMARKS.

0 5 10
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING 06/30/21 CIVIL STATE OF CALIFORNIA

LEWIS
SITE DEMOLITION PLAN

LOMPICO TANKS REPLACEMENT

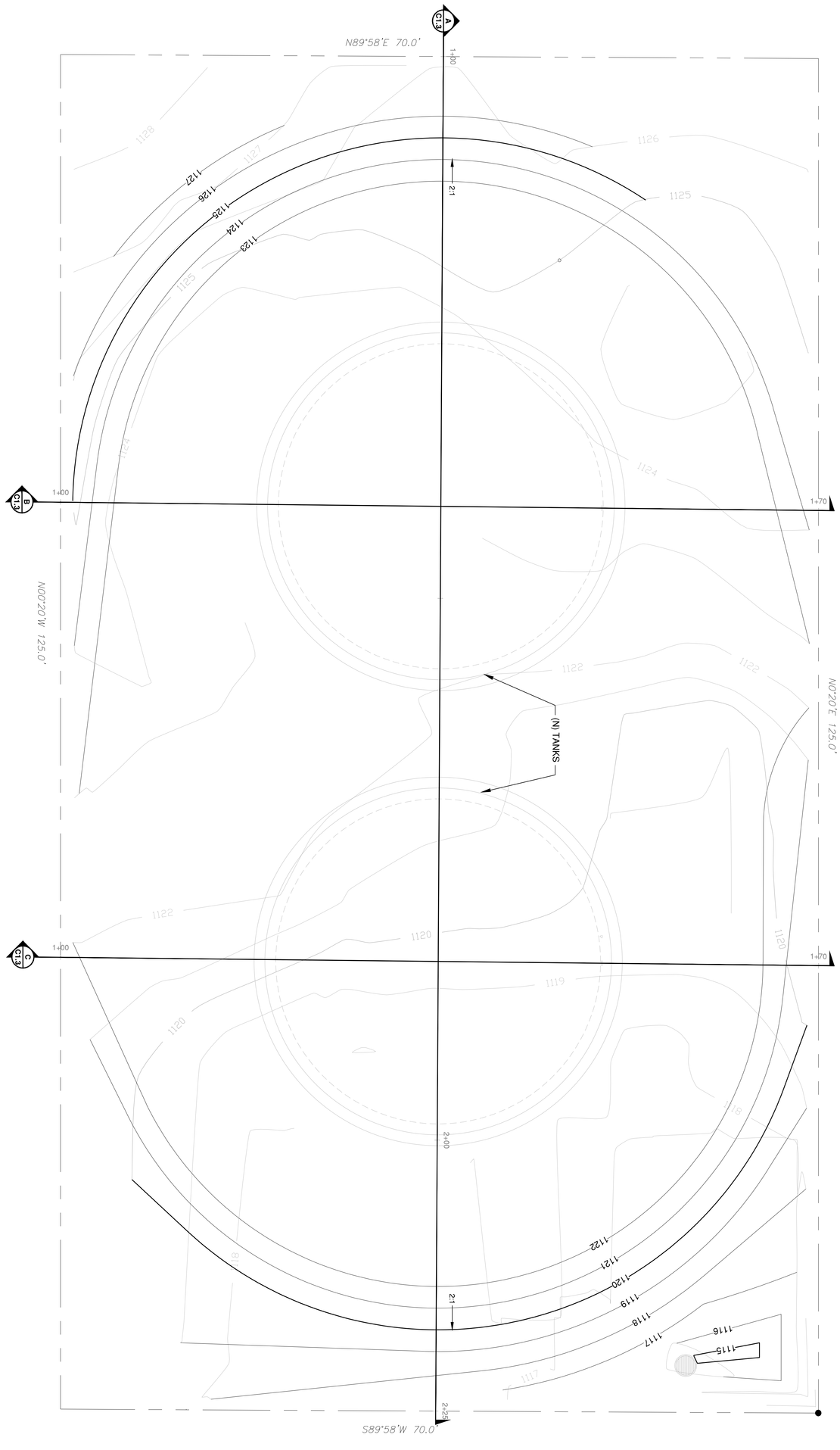
SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=5'		
SUBMITTAL:	60% SUBMITTAL		

C1.1
SHEET 10 OF 25

PRELIMINARY - NOT FOR CONSTRUCTION



0 5 10
SCALE IN FEET

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	1"=5'		
SUBMITTAL:	60% SUBMITTAL		

SHEET 11 OF 25
C1.2

San Lorenzo Valley WATER DISTRICT

LEWIS
SITE GRADING PLAN

LOMPICO TANKS REPLACEMENT

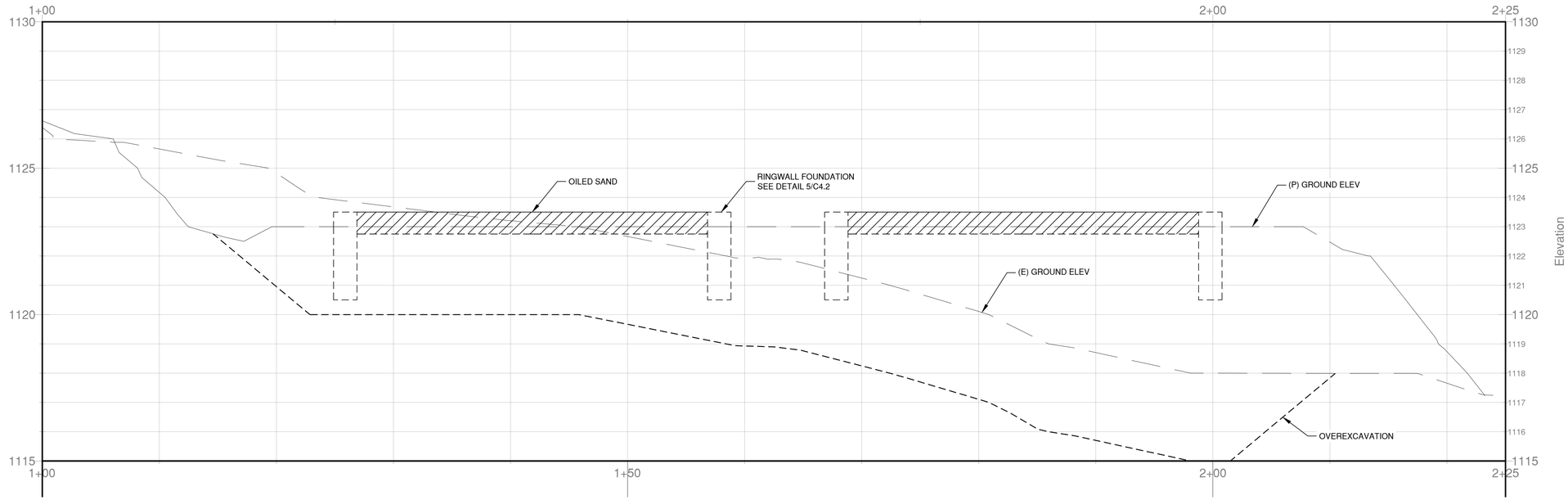
SLVWD NO. _____

REGISTERED PROFESSIONAL ENGINEER
ANDREW A. STERGULZ
No. 68703
CIVIL
STATE OF CALIFORNIA

PRELIMINARY
NOT FOR CONSTRUCTION

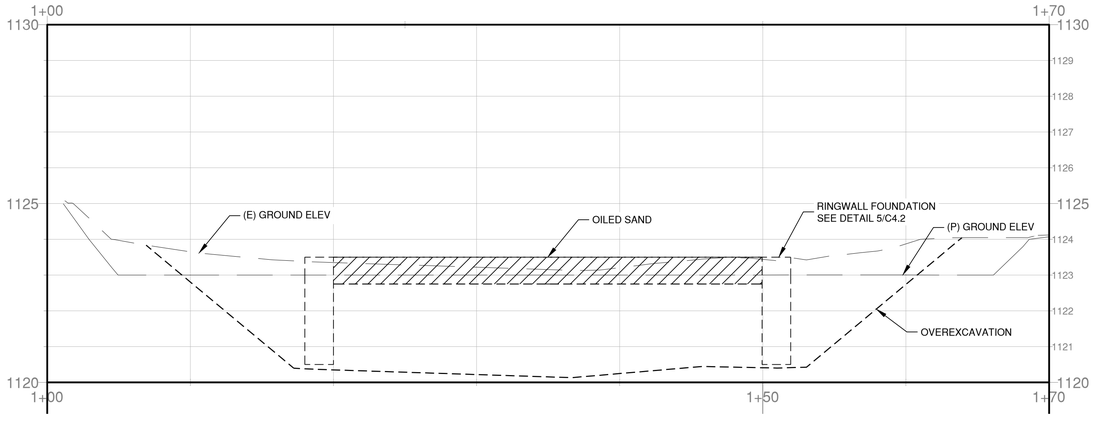
Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			



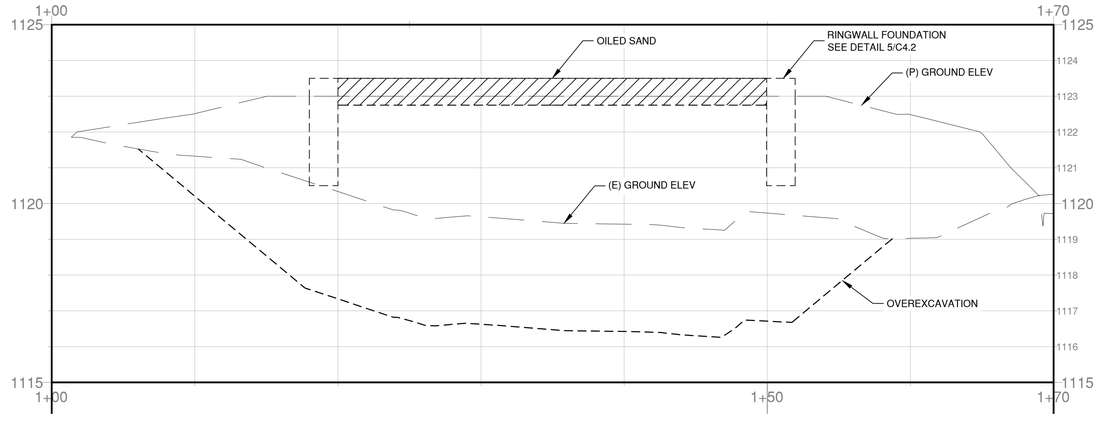
SECTION A

HORIZONTAL 1"=5'
VERTICAL 1"=2'



SECTION B

HORIZONTAL 1"=5'
VERTICAL 1"=2'



SECTION C

HORIZONTAL 1"=5'
VERTICAL 1"=2'

NOTES:
OVEREXCAVATE AND RECOMPACT EXISTING SUBGRADE PER GEOTECH REPORT. LIMIT OF OVER-EXCAVATION IS NOMINALLY 3-FEET, SUBJECT TO FIELD APPROVAL BY THE GEOTECHNICAL ENGINEER, OR WHERE SANDSTONE/SILTSTONE IS ENCOUNTERED.

0 5 10
SCALE IN FEET

PRELIMINARY - NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 68703 CIVIL STATE OF CALIFORNIA

LOMPICO TANKS REPLACEMENT

LEWIS
SITE GRADING SECTIONS

SLVWD NO. _____

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE:	05/29/2019
DRAWN BY:	CJM	DATE:	05/29/2019
QC CHECKED BY:	AAS	DATE:	05/29/2019
PROJECT NO.:			
SCALE:	AS SHOWN		
SUBMITTAL:	60% SUBMITTAL		

C1.3
SHEET 12 OF 25

N0°20'E 125.0'

(N) TEMPORARY TANK (TYP OF 4) SEE DETAIL 5/4.3

TEMPORARY INLET/OUTLET (TYP OF 4)

4" W

4" W

N89°58'E 70.0'

6" W

NORMAL TEMPORARY STORAGE OUTLET

(N) 6' TALL CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE, BOTTOM FINISH GRADE EL 1122.50 SEE DETAIL 2/C4.4

(N) 32' Ø STEEL TANK (TYP OF 2) SEE DETAIL 1/C4.1 & 4/C4.2

(N) CONCRETE RINGWALL FOOTING TOP EL 1123.50, ADJACENT AC PAVEMENT EL 1123.00 (TYP OF 2)

(N) 6" SD

TOP OF SLOPE

(E) DRAIN SUMP

DESTROY WELL NO. 5

CONTROL LINE N34°40'1"E

CENTER N 1083.47 E 964.63

LEWIS TANK 1

8.00'

8.00'

8.00'

CENTER N 1041.48 E 964.76

CONTROL LINE N34°40'1"W

LEWIS TANK 2

6" Ø TANK INLET/OUTLET (TYP OF 2)

PREVIOUSLY DESTROYED WELL NO. 3

(N) 6" TEE

6" W

(N) AC PAVEMENT WITHIN FENCE SEE DETAIL 3/C4.3

(N) DOUBLE SWING GATE SEE DETAIL 1/C4.4

12.00'

DRAINAGE SWALE FLOWLINE

(N) VALLEY GUTTER

(N) DRIVEWAY

S89°58'W 70.0'

N00°20'W 125.0'

(N) 6" Ø 11.25° BEND

(N) 6" Ø 90° BEND

INSTALL BLIND FLANGE WHEN TEMPORARY TANKS ARE REMOVED

(E) ABANDONED 3" Ø RAW WATER FROM FORMER WELL NO. 3 TO REMAIN OUTSIDE OF SLVWD PROPERTY

(E) ABANDONED 3" Ø RAW WATER FROM FORMER WELL NO. 3 TO REMAIN OUTSIDE OF SLVWD PROPERTY

(E) 6" Ø WATER TO/FROM SYSTEM

(N) 6" HOT TAP SEE DETAIL 1/C4.3

(E) 6" Ø 22.5° BEND

(E) ABANDONED 4" Ø WATER FROM FORMER LEWIS NO. 2 SYSTEM TO REMAIN

(E) ABANDONED 4" Ø RAW WATER TO REMAIN

RW

PRELIMINARY - NOT FOR CONSTRUCTION

0 5 10
SCALE IN FEET

REV. NO.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
3 Quail Run Circle, Suite 101
Salinas, CA 93907-2348
(831) 883-4848

REGISTERED PROFESSIONAL ENGINEER ANDREW A. STERLING No. 69703 CIVIL STATE OF CALIFORNIA

LEWIS
SITE IMPROVEMENT PLAN
LOMPICO TANKS REPLACEMENT

SLVWD NO.

San Lorenzo Valley WATER DISTRICT

DESIGNED BY:	CJM	DATE: 05/29/2019
DRAWN BY:	CJM	DATE: 05/29/2019
QC CHECKED BY:	AAS	DATE: 05/29/2019
PROJECT NO.:		
SCALE:	1"=5'	
SUBMITTAL:	60% SUBMITTAL	

C1.4

SHEET 13 OF 25

Attachment B.

Biological Assessment for Lewis Tank #1, near 10011 West Drive Felton, CA (APNs: 075-311-06)

Jodi McGraw Consulting
www.jodimcgrawconsulting.com
PO Box 221 • Freedom, CA • 95019
phone/fax: (831) 768-6988
jodi@jodimcgrawconsulting.com

December 9, 2016

Jen Michelsen
Environmental Programs Manager
San Lorenzo Valley Water District
13060 CA-9
Boulder Creek, CA 95006

RE: Biological Assessment for Lewis Tank #1, near 10011 West Drive Felton, CA (APNs: 075-311-06)

Dear Ms. Michelsen:

I am writing to provide you with a report of my assessment of the habitat within and adjacent to the San Lorenzo Valley Water District's Lewis Tank #1 site, located in County of Santa Cruz Assessor's parcel 075-311-06 (0.20 acres). The parcel lacks a *situs* address but is just east of 10011 West Drive in Felton, CA.

Purpose

I understand that the District is evaluating replacing the existing 100,000-gallon water tank, which is leaking, with either 2 new 100,000 gallon tanks, or 1 new 200,000-gallon tank. As part of this infrastructure project, the District is also evaluating abandoning the on-site wells, and removing a sediment basin, aerator tower, and adjacent water tanks, though the shed will remain.

The purpose of my assessment was to evaluate whether the proposed parcel features habitat for, or occurrences of, special status plants and animals including: Ben Lomond spineflower (*Chorizanthe pungens* var. *pungens*), Santa Cruz wallflower (*Erysimum teretifolium*), silverleaf manzanita (*Arctostaphylos silvicola*), Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*), Mount Hermon June Beetle (*Polyphylla barbata*) or the Zayante Band-Winged Grasshopper (*Trimerotropis infantilis*). These species occur within Sandhills communities found on Zayante coarse sand soil in central Santa Cruz County (McGraw 2004).

Existing Development and Land Use

The 0.2-acre parcel features water supply infrastructure including a 100,000-gallon tank, two wells, a shed, and water treatment infrastructure including a sediment basin, aerator tower, and adjacent water tanks. The driveway to the parcel is located 130 feet south of West Road along a graveled, unnamed access road, which would be used to access the parcel during the proposed project.

Soils

The parcel is mapped by the Soil Conservation Service as featuring Zayante soils on 5 to 30% slopes. These soils are poorly developed, deep, coarse, sand soils derived from the weathering of uplifted marine sediments and sandstones (USDA 1980). The soil I observed in the parcel was a relatively loose medium gray brown sand or loamy sand soil characteristic of Zayante soil in transitional areas, where they occur in close proximity to non-

Zayante soil. Relative to intact habitat, the soil is very compacted, perhaps as a result of efforts to level the site and install the infrastructure. Throughout the parcel, there are patches of non-native rock (e.g. drain rock), wood chips, asphalt, and concrete, brought into the site during prior infrastructure improvements and site maintenance projects.

Vegetation

The parcel features habitat that could be characterized a cleared northern maritime chaparral. Naturally occurring plant species were removed as part of work to install the infrastructure, and based on the structure and plant species composition in the area, the vegetation appears to be mowed or otherwise cleared on a regular basis.

As a result, the site is dominated by herbaceous plants including primarily exotic annual grasses and forbs including redstem filaree (*Erodium cicutarium*), rattail fescue (*Festuca myuros*), smooth cat's ears (*Hypochaeris glabra*), and ripgut brome (*Bromus diandrus*). However, native plant species occur patchily and at low abundance, and including several shrubs found in the silverleaf manzanita chaparral—a plant community found within the Sandhills ecosystem on Zayante soils in central Santa Cruz County (McGraw 2004), which occurs on the adjacent parcels to the west and north. Shrubs within the site include deer weed (*Acmispon glaber*), silver bush lupine (*Lupinus albifrons* var. *albifrons*), and yerba santa (*Eriodictyon californicum*).

The area west of the gravel road that would be used to access the site during construction features silverleaf manzanita chaparral also includes silverleaf manzanita (*Arctostaphylos silvicola*), Santa Cruz Mountains manzanita (*Arctostaphylos crinita* ssp. *crinita*), and chamise (*Adenostoma fasciculatum*).

Special-Status Plants

During my assessment, I did not observe any of the special-status plant species within the parcel, though as noted, silverleaf manzanita occurs on the adjacent parcel to the west. Endemic to the Santa Cruz Sandhills, this shrub is listed as State Rank 1B.1, which is for plants that are the most rare and endangered in California and elsewhere" (CNPS 2015). Zayante soils provide suitable habitat for Ben Lomond spineflower, which has the potential to occur in areas of less dense herbaceous plant cover which occur patchily within the parcel, as well as along the western margin of the gravel access road. A more comprehensive survey of the site and proposed access and staging areas should be conducted during the flowering season (April-June) to evaluate whether presence this or other special-status plants including Ben Lomond wallflower and Ben Lomond buckwheat could be impacted by the project. The latter two perennial plants were not observed during the late fall assessment, and are therefore unlikely to occur on the property or access road.

Special-Status Animals

Mount Hermon June Beetle

Other than in the areas covered by impervious surfaces, including the tank, shed, and other infrastructure, the project parcel and access road have the potential to support the Mount Hermon June beetle—an insect that feeds as a fossorial larva on plant roots and associated mycorrhizae, and then emerges as an adult in late spring and summer to mate. Mount Hermon June beetle occurs in areas with Zayante soils that feature a variety of vegetation, including silverleaf manzanita chaparral, sand parkland, and ponderosa pine forest, as well as areas that have been landscaped and feature ornamental vegetation. Perhaps because it lives 99% of its life belowground, the Mount Hermon June beetle has been found within developed areas and other areas

impacted by human uses, including mowed areas subject to recreation and denuded areas, such as vehicle turnouts along roads. Though the drain rock/decomposed gravel, and wood chips degrade habitat for the fossorial insect, these areas may still be occupied as they soil coverings are not completely impervious. The Mount Hermon June beetle has been observed just west of the subject parcel (USFWS 2009).

Zayante Band-Winged Grasshopper

The property does not provide suitable habitat for the Zayante band-winged grasshopper—an insect that requires open sunlit, sparsely vegetated areas within largely intact sand parkland habitat. The dense chaparral and forest surrounding the parcel is not suitable. Although the tank parcel has been cleared, the small grasshopper, which flies only short distances, would be highly unlikely to colonize the area. The nearest population of the Zayante band-winged grasshopper is located approximately 1.1 miles south within the Quail Hollow Ecological Reserve (USFWS 2009).

Implications

Although degraded by prior use for as a water treatment and storage facility, the subject parcel supports sensitive communities and species of the Santa Cruz Sandhills. Development of Sandhills habitat is regulated by local, state, and federal statutes. The County of Santa Cruz Sensitive Habitat Ordinance protects Sandhills communities, including silverleaf manzanita chaparral, and habitats for rare species including the Mount Hermon June beetle. The ordinance requires that disturbance of sensitive habitat and rare species be avoided; where it cannot be avoided, it must be minimized and mitigated. As a special district, the San Lorenzo Valley Water District is exempt from County zoning and planning regulations related to facilities for the storage or transmission of water (M. Johnston, pers. comm. 2015).

The federal Endangered Species Act protects federally-endangered species, including the Mount Hermon June beetle, Zayante band-winged grasshopper, Ben Lomond spineflower, and Ben Lomond wallflower. The federal Endangered Species Act makes it illegal to 'take' (kill, harm, harass, etc.) endangered animals including the Mount Hermon June beetle and Zayante band-winged grasshopper. However, the U.S. Fish and Wildlife Service (USFWS), which administers the Act, can permit take of the endangered insect that might occur incidentally during otherwise lawful projects, such as public infrastructure projects, by issuing what is known as an 'incidental take permit' (ITP).

To receive a federal ITP, project proponents must complete a Habitat Conservation Plan (HCP), which outlines how they will mitigate the project's negative effects on the endangered species. Mitigation must include steps to avoid, minimize, and repair impacts at the project site, as well as efforts to compensate for them by benefiting similar habitat elsewhere. The mitigation provided in the HCP can often also satisfy requirements of the County's Sensitive Habitat Ordinance, when necessary.

As you are aware, the District has recently submitted an HCP to replace another leaking water tank in Sandhills habitat. As one of two alternate forms of mitigation, the HCP proposes that the District set aside 5.5 acres of habitat at the Olympia Wellfield to mitigate the impacts of that project. Assuming that the current HCP is approved and the District opts to establish the habitat set aside, an HCP for the Lewis Tank Replacement Project could utilize a portion of the remaining 4.5 acres of habitat protected and managed within the site to offset the impacts of the Lewis Tank replacement.

This information is provided to aid evaluation of your proposed project. I recommend that you discuss project permitting requirements with the USFWS, which administers the Endangered Species Act, and the County of

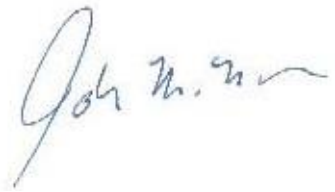
Santa Cruz Planning Department, which administers the Sensitive Habitat Ordinance and is otherwise responsible for local land use permitting. The following contact information for agency personnel knowledgeable about the local and federal regulations is provided to assist you.

Contact information for agency representatives knowledgeable about regulations influencing development of Sandhills habitat

U.S. Fish and Wildlife Service	County of Santa Cruz
Chad Mitcham	Matt Johnston
Deputy Assistant Field Supervisor	Environmental Coordinator
US Fish and Wildlife Service	County of Santa Cruz
2493 Portola Road, Suite B	701 Ocean Street
Ventura, CA 93003	Santa Cruz, CA 95060
(831) 768-7794	(831) 454-3114
Chad_Mitcham@fws.gov	PLN458@co.santa-cruz.ca.us

I hope you will not hesitate to contact me if you have any questions or if I can assist you further.

Sincerely,



Jodi M. McGraw

e-cc: Rick Rogers, Director of Operations

References

California Native Plant Society. 2015. Inventory of rare and endangered plants of California. Sacramento, CA. Accessed on-line at: http://www.rareplants.cnps.org/

McGraw, J. M. 2004. Sandhills conservation and management plan: a strategy for preserving native biodiversity in the Santa Cruz Sandhills. Report submitted to the Land Trust of Santa Cruz County, Santa Cruz, CA.

Johnston, M. 2015. E-mail from County of Santa Cruz Environmental Coordinator regarding the San Lorenzo Valley Water District's Probation Tank Replacement Project. Sent to Rodney Cahill, Mesiti-Miller Engineering. February 11, 2015.

U.S. Department of Agriculture. 1980. Soil Survey of Santa Cruz County. Soil Conservation Service, United States Department of Agriculture and University of California.

U.S. Fish and Wildlife Service. 2009. Zayante band-winged grasshopper and Mount Hermon June beetle five-year review. US Fish and Wildlife Service. August 2009.

APPENDIX G

EMAIL RESPONSE FROM THE UNITED STATES FISH AND WILDLIFE SERVICE REGARDING ESA COMPLIANCE AT LEWIS TANK

From: Mitcham, Chad
To: Jen Michelsen
Cc: Jodi McGraw; Matt Johnson; Leilani Takano; Rick Rogers; James Furtado; Darren Langfield
Subject: Re: [EXTERNAL] SLVWD Lompico Tanks Replacement Project
Date: Monday, July 15, 2019 4:22:51 PM

Jen,

We have received your request for authorization to conduct emergency replacement of the San Lorenzo Valley Water District's (Water District) Lewis Tank in Santa Cruz County, California. We understand that the Water District has determined this project is necessary to ensure continued water supply for residents that are served by the Lewis Tank. Tank replacement would occur within suitable habitat for the Mount Hermon June beetle (*Polyphylla barbata*) and Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*).

The Water District would conduct the tank replacement project at the earliest opportunity and has proposed measures (see letter dated July 9, 2019) to minimize effects to sensitive species in the project area, which include but are not limited to: having a qualified biologist onsite during all ground disturbing activities, collection and reseeding of Ben Lomond spineflower seed within a 0.08-acre area, covering open soil with impervious materials if ground disturbing activities are conducted within the flight season of the Mount Hermon June beetle, and setting aside and funding management of 0.67-acre of habitat for the Mount Hermon June beetle and Ben Lomond spineflower within the 6.7-acre conservation area at the Olympia Wellfield. We acknowledge that the Water District has determined the tank replacement project to be an emergency and is proposing measures to offset impacts to sensitive species. Within 60 days of project completion, we request that you provide the Service with a summary report of activities conducted as well as any observed take resulting from project activities.

We endeavor to work with partners such as the Water District to ensure priority projects are able to move forward with little delay. As such, we highly anticipate, by December 2019, receipt of an application and draft Habitat Conservation Plan (HCP) for all activities that the Water District may need to implement for the foreseeable future. An HCP would provide the Water District incidental take coverage under the federal Endangered Species Act as well as provide a well-planned conservation plan for the species on Water District land. Thank you for your coordination on this project, and please contact me if you have any questions.

Sincerely,

Chad Mitcham
Fish & Wildlife Biologist

U.S. Fish & Wildlife Service
VFWO, Santa Cruz sub-office
1100 Fiesta Way
Watsonville, CA 95076
(805) 677-3328

On Tue, Jul 9, 2019 at 11:51 AM Jen Michelsen <jmichelsen@slvwd.com> wrote:

> Dear Chad,
>
> The San Lorenzo Valley Water District is working to replace old, leaking redwood tanks that serve the Lompico Community. One of those tanks, called the Lewis Tank, is located within suitable habitat for the Mount Hermon June Beetle. We met by teleconference on June 3, 2019 to discuss the Lewis Tank Replacement Project as an emergency project. On June 12th the Lewis tank began to leak excessively. SLVWD employed divers to repair the tank, however SLVWD has determined that the tank will soon fail. To ensure water storage and availability for the residents that rely on the Lompico Tanks infrastructure (which includes Lewis tank), SLVWD proposes to install temporary storage tanks at the Lewis Tank site and proceed with the replacement project as soon as possible.
>
> The attached memo describes the Lompico Tanks Replacement Project including: the temporary tank placement alternatives, temporary and permanent impacts resulting from the temporary tanks and the construction to replace the Lewis Tank as well as minimization & mitigation measures and restoration measures to be implemented for the temporary tanks, during construction and following construction.
>
> Emergency Permit: Due to the risk of failure of the Lewis Tank, we would like to request an emergency permit to install the temporary tanks and proceed with the replacement of the Lewis tank as soon as possible.
>
> Sandhills HCP: The District is also working toward proposing a programmatic permit for other upcoming infrastructure replacement & maintenance projects that exist in sandhills habitat. The District is currently in contract with McGraw Consulting who is working to prepare a draft Habitat Conservation Plan for the projects and will be coordinating with USFWS on that effort. We anticipate the the HCP will be available for review by the USFWS in December 2019.
>
> Sandhills Database: Additionally, the District will work with McGraw Consulting to update the Sandhills Projects Database that McGraw Consulting created on behalf of the District to help the Service track Sandhills conservation and mitigation projects. The Service has requested that the District update the database for each project such as this, so that the Service has a spatial record of where projects and the associated mitigation have occurred.
>
> We appreciate your assistance with this process and we look forward to future collaborative efforts with you to protect natural resources in the San Lorenzo Valley. If you have any questions or concerns please

feel free to contact me or the other staff at the District, Darren Langfield - District Engineer, Rick Rogers - District Manager or our consultants Matt Johnson or Jodi McGraw copied here to discuss the project(s).

Sincerely,

Jen Michelsen

Jen Michelsen
Environmental Programs Manager
San Lorenzo Valley Water District
(831) 430-4627
Jmichelsen@slvwd.com