MITIGATED NEGATIVE DECLARATION

Groveland Community Services District Water Distribution System Improvements

September 2018

PREPARED FOR:

Groveland Community Services District
18966 Ferretti Road
Groveland, CA 95321

PREPARED BY:

Crawford & Bowen Planning, Inc.
113 N. Church Street, Suite 302
Visalia, CA 93291

Initial Study/Mitigated Negative Declaration

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Crawford & Bowen Planning, Inc.
113 N. Church Street, Suite 302
Visalia, CA 93291

Contact: Travis Crawford, AICP
(559) 840-4414

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INTRODUCTION

INTRODUCTION

1.1 Project Summary

This document is the Initial Study/Mitigated Negative Declaration describing the potential environmental effects of implementing a series of upgrades to the Groveland Community Services District (CSD) water system. The CSD intends to install and replace water mains and associated infrastructure in the communities of Big Oak Flat, Groveland, and White Gulch (Project). The proposed Project is more fully described in Chapter Two – Project Description.

The Groveland Community Services District will act as the Lead Agency for this project pursuant to the *California Environmental Quality Act (CEQA)* and the *CEQA Guidelines.*

The Project is expected to be funded with Drinking Water State Revolving Fund (DWSRF) funds administered through the California State Water Resources Control Board (Water Board). One requirement of DWSRF funding is that the City will be required to comply with the Water Board's environmental requirements including CEQA-Plus. CEQA-Plus involves additional environmental analysis of certain topics to include federal thresholds, rules and regulations (for topics such as air, biology, cultural, etc.). In addition to this Mitigated Negative Declaration, the CSD is preparing a separate Environmental Package for submittal to the Water Board which includes the CEQA-Plus analysis.

1.2 Document Format

This IS/MND contains five chapters, and appendices. Section 1, Introduction, provides an overview of the project and the CEQA environmental documentation process. Chapter 2, Project Description, provides a detailed description of project objectives and components. Chapter 3, Initial Study Checklist, presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the proposed project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why no impacts are expected. If the project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. Chapter 4, Mitigation Monitoring and Reporting Program, provides the proposed mitigation measures, completion timeline, and person/agency responsible for implementation and Chapter 5, List of Preparers, provides a list of key personnel involved in the preparation of the IS/MND.

Environmental impacts are separated into the following categories:

Potentially Significant Impact. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

Less Than Significant After Mitigation Incorporated. This category applies where the incorporation of mitigation measures would reduce an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less Than Significant Impact. This category is identified when the project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact. This category applies when a project would not create an impact in the specific environmental issue area. "No Impact" answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.)

Regardless of the type of CEQA document that must be prepared, the basic purpose of the CEQA process as set forth in the CEQA Guidelines Section 15002(a) is to:

(1) Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.
(2) Identify ways that environmental damage can be avoided or significantly reduced.
(3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
(4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

According to Section 15070(b), a Mitigated Negative Declaration is appropriate if it is determined that:

(1) Revisions in the project plans or proposals made by or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

(2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

The Initial Study contained in Section Three of this document has determined that with mitigation measures and features incorporated into the project design and operation, the environmental impacts are less than significant and therefore a Mitigated Negative Declaration will be adopted.

Chapter 2

PROJECT DESCRIPTION

Project Description

2.1 Location

The proposed Project will take place in three adjacent communities; Big Oak Flat, Groveland, and White Gulch, in western Tuolumne County (see Figure 1). The three communities are within the Groveland Community Services District (CSD or District) and lie generally along State Route 120, south and southwest of Pine Mountain Lake and east of State Route 49. Yosemite National Park lies approximately 23 miles southeast of the Project site. Project elevation ranges from approximately 2800 feet to approximately 3100 feet above mean sea level. The proposed Project is located in Township 1S, Range 16E, Sections 20, 21, 23, 27, 29 and 30, MDB&M and proposed improvements are shown in Figures 2 through 4.

2.2 Setting and Surrounding Land Use

The Groveland CSD provides water under Domestic Water Supply Permit No. 03-11-13P-008 and obtains all of its water from the San Francisco Public Utilities Commission's Hetch Hetchy Reservoir. The water originates in Yosemite National Park as snow melt from a large watershed into the High Sierra. The District's existing water system distributes water to the populated areas of Big Oak Flat, Groveland, and Pine Mountain Lake. The District's water supply and distribution system includes three water treatment plants, five storage reservoirs, and approximately 70 miles of distribution piping. The District provides a treated water supply to approximately 3,500 customers.

The proposed Project site consists of developed and disturbed land cover including roads, residential development, and commercial development. The surrounding land cover is composed of cismontane woodland. Intermittent and ephemeral waterways are present within fifty feet of each of the three work locations.

Figure 1 – Regional Location Map

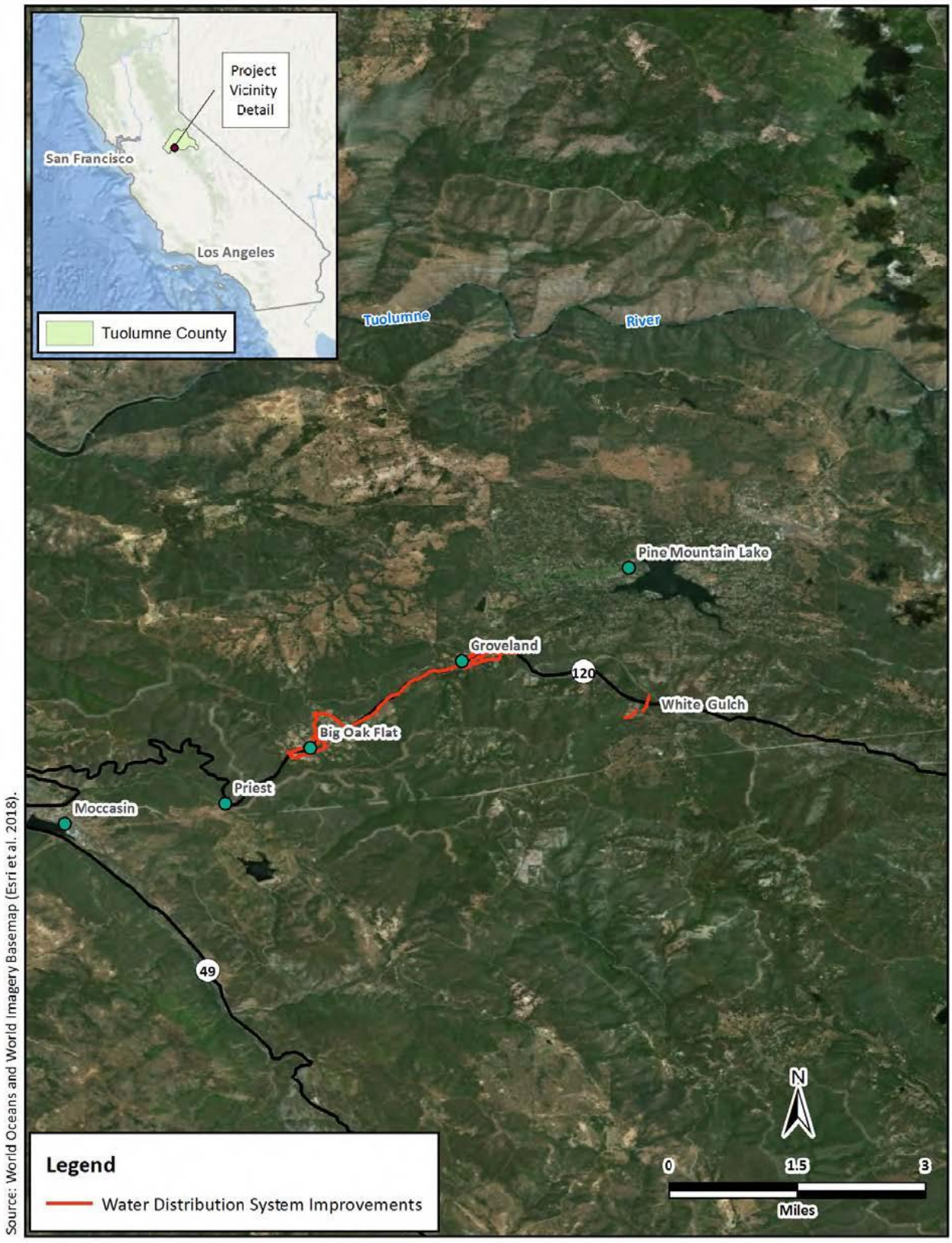

Figure 2 – Big Oak Flats Project Area

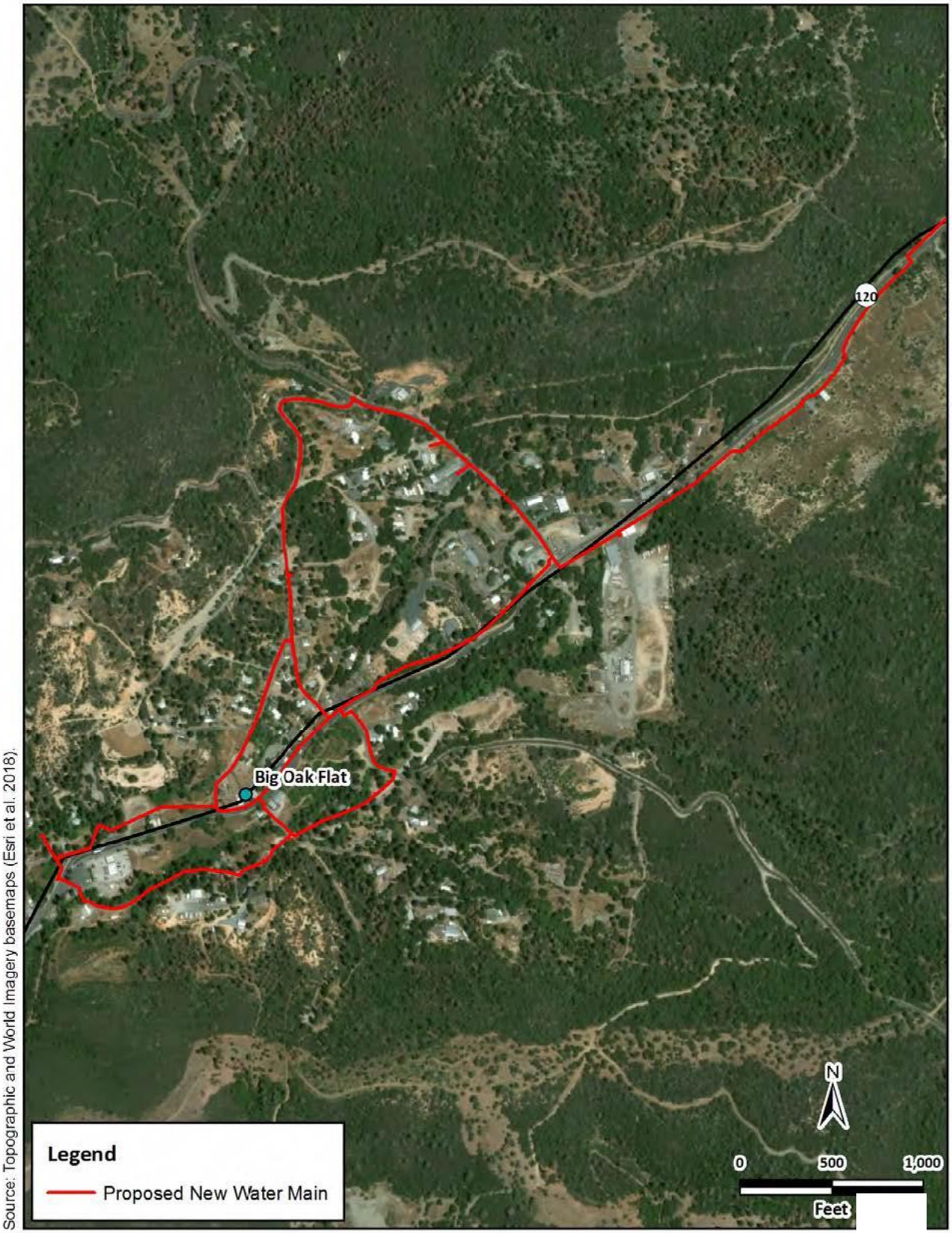

Figure 3 – White Gulch Project Area

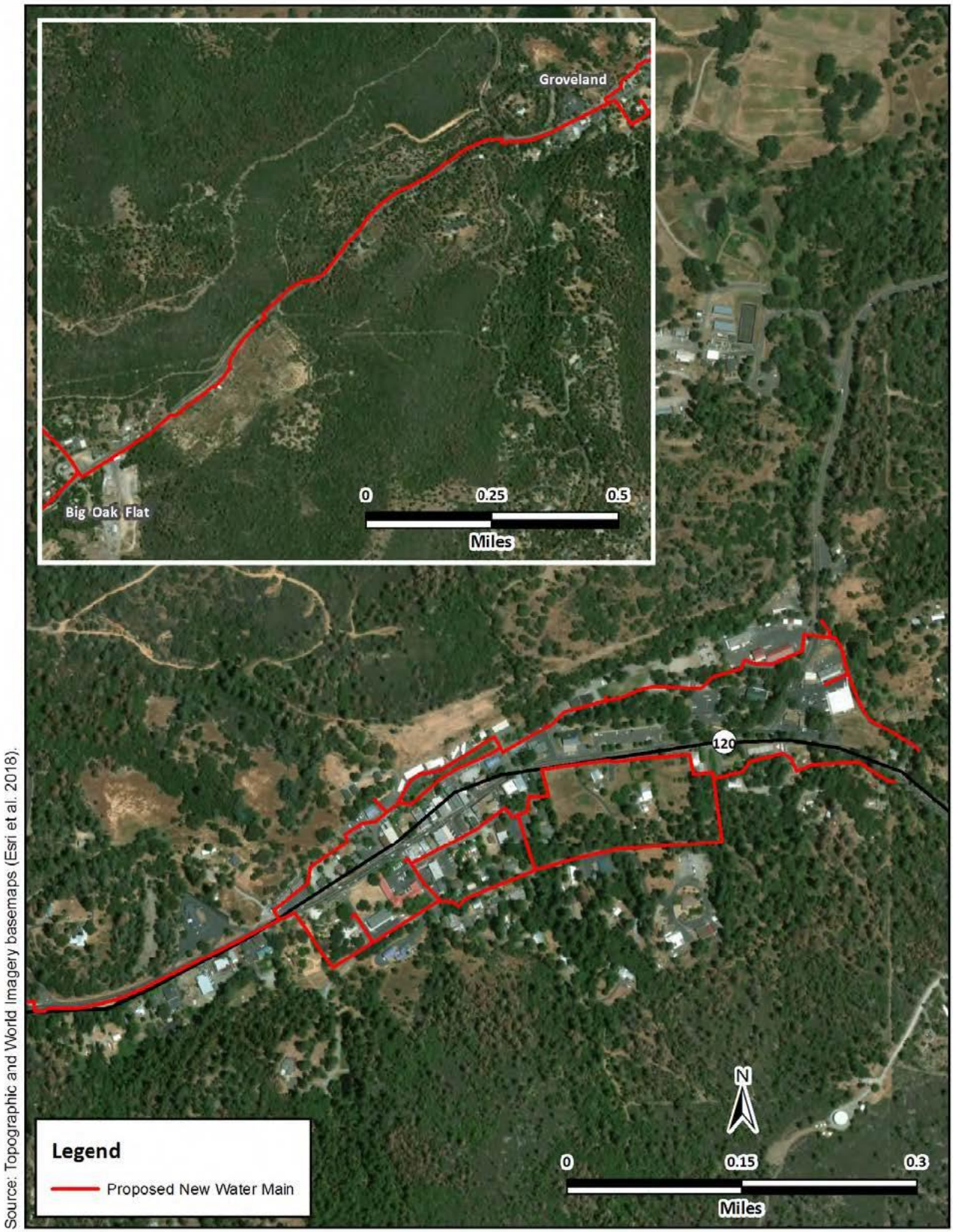

Figure 4 – Groveland Project Area

2.3 Project Background

The Groveland Community Services District proposes to install and replace water mains and associated infrastructure in the communities of Big Oak Flat, Groveland, and White Gulch. The District will obtain financing for this water distribution systems improvement project (Project) from the Drinking Water State Revolving Fund (DWSRF). The DWSRF is administered by the State Water Resources Control Board and partially funded by a capitalization grant from the United States Environmental Protection Agency (EPA). Due to this federal nexus, issuing funds from the DWSRF constitutes a federal action, one that requires the EPA to determine whether the proposed action may affect federally protected resources. The Project must therefore comply with requirements of both the California Environmental Quality Act (CEQA) and certain federal environmental laws and regulations. This state and federal review process is known as CEQA-Plus.

The District's current Water Master Plan was adopted in 2001, outlining anticipated improvements to the District's water infrastructure to improve fire flows and accommodate expected demand growth. The Plan focuses on infrastructure needs throughout the District's service area, including the buildout of the Pine Mountain Lake water distribution system.

The project is needed to improve the water supply reliability of Groveland and Big Oak Flat and to provide the required infrastructure to meet fire flow requirements. Additional, water mains within the project area are subject to frequent main breaks, which cause disruptions in service and water losses in the system. Providing water distribution system improvements would reduce the water use of the District and lower the cost to operate and maintain the system.

2.4 Project Description

An Engineering Design Report entitled "Groveland Community Services District – Water Distribution System Improvements" was prepared by AM Consulting Engineers in May 2017 to address the needed improvements and is included as an Appendix to this CEQA document. Please refer to that document for specific project characteristics. A summary of Project activities is included herein.

The Project involves installing or replacing approximately 10,203 linear feet of 8-inch diameter water main as well as new gate valves, pressure reducing valves, and four fire hydrants in the downtown Groveland water distribution system; approximately 10,306 linear feet of 8-inch diameter water main as well as new gate valves, pressure reducing valves, and nine fire

hydrants in the Big Oak Flat water distribution system; approximately 7,212 linear feet of 8-inch water main and two fire hydrants in the connection between the communities of Groveland and Big Oak Flat; and approximately 1,956 linear feet of 8-inch water main and one fire hydrant in the water distribution system that feeds White Gulch.

Specifically, the Project is broken down as follows:

Anticipated improvements to the downtown Groveland water distribution system:

- Construct 4,995 linear feet (LF) of 6" water main on the lots to the north of Highway 120.
- Construct 160 LF of 6" water main to connect the existing water main to the new water main north of Highway 120.
- Construct 2,610 LF of 6" water main on the lots to the south of Highway 120 and along Back Street.
- Construct 1,310 LF of 6" water main along Foote Street and extending to the east.
- Construct 2 segments of water main, 440 LF and 290 LF respectively, connecting the new water main south of Highway 120 to the new water main along Foote Street.
- Construct 215 LF of 6" water main along Power House Street connecting the new water main on Back Street to the new water main along Foote Street.
- Construct 385 LF of 6" water main connecting the new water mains north of Highway 120 to the new water mains south of Highway 120.
- Construction of new gate valves, pressure reducing valves and fire hydrants along the new water mains, as needed.

Anticipated improvements to the Big Oak Flat water distribution system:

- Replace 2,000 LF of 4" water main with 6" water main along Wards Ferry Road, including two (2) gate valves and three (3) fire hydrants.
- Replace 1,015 LF of 4" water main with 6" water main along Scofield Street including one (1) gate valve and three (3) fire hydrants.
- Replace 1,040 LF of 4" water main with 6" water main along Big Oak Road including one (1) gate valve and one (1) fire hydrant.
- Replace 320 LF of 4" water main with 6" water main along Henderson Street including one (1) gate valve and one (1) fire hydrant.
- Replace 295 LF of 4" water main with 6" water main along Black Road including one (1) gate valve and two (2) fire hydrants.
- Replace 745 LF of 4" water main with 6" water main along Harper Street.

- Replace 250 LF of 4" water main with 6" water main along School Street including two (2) gate valves.
- Replace 1,150 LF of 4" water main with 6" water main along Yates Street including one (1) gate valve and one (1) fire hydrant.
- Replace 305 LF of 4" water main with 6" water main along Vassar Street including one (1) fire hydrant and a crossing underneath highway 120.
- Construct 1,200 LF of 6" pipe along Ward Ferry Road and Scofield Street to loop the system including one (1) new PRV, three (3) new fire hydrants, and two (2) new gate valves.

Anticipated improvements to the water distribution system in the White Gulch area:

- Replace 5,170 LF of 6" water main along White Gulch Road, near Highway 120.
- Replace 1,200 LF of 4" water main with 6" water main along Old Highway 120.
- Construction of new gate valves, pressure reducing valves and fire hydrants along the new water mains, as needed.

Both conventional trenching methods and pipe bursting were considered for water mains to be replaced. Conventional construction requires detailed geotechnical investigations and topographical surveys to locate existing utilities that may be impacted by the excavation of the sewer line. Conventional construction uses heavy equipment to dig the trenches and requires surface restoration of the excavated trench.

Pipe bursting is a method by which the existing pipe is forced outward and opened by a bursting tool. In pipe bursting the existing pipe is used as a guide for inserting the expansion head (part of the bursting tool). The expansion head, typically pulled by a cable rod and winch, increases the area available for the new pipe by pushing the existing pipe radially outward until it cracks. The bursting device pulls the new pipeline behind itself.

During the pipe bursting process, the rehabilitated pipe segment must be taken out of service by rerouting flows around it. After the pipe bursting is completed, laterals are re-connected, typically by conventional excavation methods.

Project Schedule
Construction is expected to take approximately one year and is expected to begin in 2019.

2.5 Objectives

The primary objectives of the proposed project are as follows:

- The Groveland Community Services District primary objective is to provide clean drinking water to the communities it serves.
- The Groveland Community Services District seeks to effectively distribute its' water supply and ensure sufficient water pressure is available for multiple users.
- The District seeks to operate the water distribution system with the most cost-effective methods available that meet the District's overall system performance and regulatory compliance requirements.

2.6 Other Required Approvals

The proposed Project will include, but not be limited to, the following regulatory requirements:

- The adoption of a Mitigated Negative Declaration by the Groveland Community Services District.
- Regional Water Quality Control Board approval.
- State Water Board approval.
- Regulatory Agency permitting for work in jurisdictional waterways:
  - CA Fish & Wildlife Streambed Alteration Agreement
  - RWQCB 401 permit
  - Army Corps of Engineers Nationwide Permit

Chapter 3

IMPACT ANALYSIS

Initial Study Checklist

3.1 Environmental Checklist Form

Project title:

Groveland Community Services District Water Distribution System Improvements

Lead agency name and address:

Groveland Community Services District
18966 Ferretti Road
Groveland, CA 95321

Contact person and phone number:

Alfonso Manrique, PE: 559.473.1371

Project location:

See Section 2.1

Project sponsor's name/address:

Groveland Community Service District

General plan designation:

Various, District-wide project

Zoning:

Various, District-wide project

Description of project:

See Section 2.3

Surrounding land uses/setting:

See Section 2.2

Other public agencies whose approval or consultation is required (e.g., permits, financing approval, participation agreements): See Section 2.5

3.2 Environmental Factors Potentially Affected

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

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

3.3 Determination

On the basis of this initial evaluation:

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

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

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

☐ I find that the proposed project MAY have a "potentially significant impact" or

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

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

_____ _____

Groveland Community Services District Date

I. AESTHETICS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

RESPONSES

a. Have a substantial adverse effect on a scenic vista?

No Impact. The proposed Project involves upgrades to a water distribution system that will include installing underground water main pipelines and installing fire hydrants and other appurtenances. Views of surrounding areas will not be impacted by the project, since the majority of the finished work will be below grade. Any replacement of above-ground structures such as fire hydrants or installation of structures such as water treatment equipment, pumps, or fencing will be similar to existing facilities and will not introduce new features that are not already common to the built environment along the existing water distribution system. As such, the proposed Project will not impede any scenic vistas.

Construction activities will occur over a 12-month period and will be visible from the adjacent roadsides; however, the construction activities will be temporary in nature and will not affect a scenic vista, as described above. There will be ***no impact***.

Mitigation Measures: None are required.

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

No Impact. There are no state designated scenic highways within the vicinity of the proposed Project site.[1] California Department of Transportation Scenic Highway Mapping System identifies portions of State Routes 49 and 108 in Tuolumne County (north and west of the Project site) as being eligible for state scenic highway designation, but they are not officially designated. The proposed Project would not damage any trees, rock outcroppings or historic buildings within a State scenic highway corridor. There is ***no impact.***

Mitigation Measures: None are required.

c. Substantially degrade the existing visual character or quality of the site and its surroundings?

Less than Significant Impact. The majority of the work (proposed pipelines) will be installed underground. The pipeline will not be visible once installed. Any replacement of above-ground structures such as fire hydrants or installation of structures such as water treatment equipment, pumps, or fencing will be similar to existing facilities and will not introduce new features that are not already common to the built environment along the existing water distribution system. Construction activities will be seen by the residences within the immediate vicinity and by vehicles driving in the District; however, construction activities will be temporary.

As such, the proposed Project will not substantially degrade the existing visual character or quality of the area or its surroundings.

The impact will be ***less than significant***.

Mitigation Measures: None are required.

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. Currently the sources of light in the project area are from building lights, the vehicles traveling along surrounding roads, and some security lighting at nearby businesses and some residences. No lighting will be associated with pipeline installation. Accordingly, the

[1] California Department of Transportation. California Scenic Highway Mapping System. Tuolumne County. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/. Accessed August 2018.

proposed Project would not create substantial new sources of light or glare. Potential impacts are ***less than significant***.

Mitigation Measures: None are required.

II. AGRICULTURE AND FOREST RESOURCES

Would the project:

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

RESPONSES

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

No Impact. The Farmland Mapping and Monitoring Program has not mapped farmland in Tuolumne County and as such, the Project does not include conversion of designated farmland to non-farmland. The proposed Project includes the installation of new and replacement water mains and associated appurtenances. The pipeline and associated infrastructure will largely occur within the existing right of way and will be installed underground. The purpose of the Project is to improve the existing Groveland CSD water infrastructure and does not have the potential to result in the conversion of farmland to non-agricultural uses or forestland uses to non-forestland. There is ***no impact***.

Mitigation Measures: None are required.

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

No Impact. There are no agricultural lands in the City under a Williamson Act Contract. The proposed Project does not include land under a Williamson Act Contract. There is ***no impact***.

Mitigation Measures: None are required.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. The proposed Project is not zoned for forestland and does not propose any zone changes related to forest or timberland. There is ***no impact***.

Mitigation Measures: None are required.

d. Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. No conversion of forestland, as defined under Public Resource Code or General Code, as referenced above, would occur as a result of the proposed Project. There is ***no impact***.

Mitigation Measures: None are required.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. No land conversion from Farmland would occur as a result of the proposed Project. The proposed Project includes new water mains and associated hydrants and valves, largely within the existing right-of-way. All improvements will take place within an area that is built up with rural and urban uses. As such, the proposed Project does not have the potential to result in the conversion of Farmland to non-agricultural uses or forestland uses to non-forestland. There is ***no impact***.

Mitigation Measures: None are required.

III. AIR QUALITY

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

RESPONSES

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

Less than Significant Impact. The Tuolumne County Air Pollution Control District is designated nonattainment of state air quality standards for ozone.[2] Because of the region's non-attainment status for ozone, if the project-generated emissions of either of the ozone precursor pollutants (ROG or NOx)

[2] California Air Resources Board. Area Designations for State Ambient Air Quality Standards. Ozone. https://www.arb.ca.gov/desig/adm/2016/state_o3.pdf. Accessed August 2018.

were to exceed the TCAPCD's significance thresholds of 100 tons per year of ROG or NOX[3], then the project uses would be considered to conflict with the attainment plan. In addition, if the project uses were to result in a change in land use and corresponding increases in vehicle miles traveled, they may result in an increase in vehicle miles traveled that is unaccounted for in regional emissions inventories contained in regional air quality control plans.

As discussed in Impact c), below, predicted construction and operational emissions would not exceed the TCAPCD's significance thresholds for ROG, NOx, PM_{10}, and $PM_{2.5}$. As a result, the Project uses would not conflict with emissions inventories contained in regional air quality attainment plans, and would not result in a significant contribution to the region's air quality non-attainment status. Additionally, the Project would comply with all applicable rules and regulations. Therefore, this impact is ***less than significant.***

Mitigation Measures: None are required.

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

Less than Significant Impact. The proposed Project would generate emissions associated with the installation of pipelines and associated appurtenances, both from worker vehicle trips and from construction equipment. Construction emissions would be considered short-term and temporary emissions because construction emissions would cease following completion of installation. Following construction activities, operation of the water main would be a passive process. No increase in long-term operations emissions is anticipated to occur and as such, any impacts would be *less than significant.*

Mitigation Measures: None are required.

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

Less than Significant Impact. The nonattainment pollutants for the TCAPCD is ozone. Therefore, the pollutants of concern for this impact are ozone precursors. Ozone is a regional pollutant formed by chemical reaction in the atmosphere, and the Project's incremental increase in ozone precursor generation is used to determine the potential air quality impacts.

[3] Tuolumne County Air Pollution Control District. CEQA Thresholds of Significance. https://www.tuolumnecounty.ca.gov/DocumentCenter/View/1072/TCAPCD_Significance_Thresholds__2_?bidId=. Accessed August 2018.

The annual significance thresholds to be used for the Project emissions are as follows[4]:

- Reactive Organic Gases (ROG) – 1,000 lbs/day or 100 tons per year
- Oxides of Nitrogen (NOx) – 1,000 lbs/day or 100 tons per year
- Particulate Matter (PM10) – 1,000 lbs/day or 100 tons per year
- Carbon Monoxide (CO) – 1,000 lbs/day or 100 tons per year

As mentioned previously, the pipeline will not generate emissions once it is constructed. The estimated annual construction emissions are shown below. The Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, Version 8.1.0 was utilized to estimate emissions generated from project construction. Modeling results are provided in Table 1 and the Road Construction Emissions Model output files are provided in Appendix A.

Table 1
Proposed Project Construction Emissions

Pollutant/ Precursor	Construction Emissions (tpy)	Threshold/ Exceed?
CO	2.92	100/**N**
NOx	3.84	100/**N**
ROG	0.39	100/**N**
PM_{10}	0.76	100/**N**

Any impacts would be considered ***less than significant***.

Mitigation Measures: None are required.

d. Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. The nearest sensitive receptors to the proposed Project site are the residential houses located along the proposed pipeline alignment, as the objective of the project is to provide residents with a reliable and adequately pressurized water source.

Construction would take place within the vicinity of sensitive receptors; however, construction emissions would be well below TCAPCD thresholds and be temporary in nature. Therefore, the small amount of emissions generated, and the short duration of the construction period would not expose sensitive receptors to substantial pollutant concentrations. Impacts to sensitive receptors would be ***less than significant***.

[4] Tuolumne County Air Pollution Control District. CEQA Thresholds of Significance. https://www.tuolumnecounty.ca.gov/DocumentCenter/View/1072/TCAPCD_Significance_Thresholds__2_?bidId=. Accessed August 2018.

Mitigation Measures: None are required.

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

Less than Significant Impact. Typical facilities that generate odors include wastewater treatment facilities, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, and food process facilities. The installation and operation of new water mains for the residents of the Groveland CSD is not anticipated to be a significant generator of odors. Construction activities would temporarily generate diesel PM exhaust from heavy-duty trucks and off-road construction equipment; however, any odors generated would be temporary, short-term, and would occur only in the immediate vicinity of the construction site. Any impacts would be ***less than significant***.

Mitigation Measures: None are required.

IV. BIOLOGICAL RESOURCES

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐

e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f.	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

RESPONSES

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

Less than Significant Impact With Mitigation. Colibri Ecological Consulting, LLC, (CEC) was retained to conduct a reconnaissance survey to describe the biotic resources of the proposed Project site and to evaluate potential impacts to those resources that could result from proposed Project development.

Methodology

CEC performed a search of the California Natural Diversity Database (CNDDB) and the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS) for records of special-status plants and animal species in the proposed Project area. Regional lists of special-status species were compiled using U.S. Fish and Wildlife Service, CNDDB, and CNPS database searches confined to the Groveland 7.5-minute Unites States Geological Survey topographic quad, which encompasses the proposed Project site, and the eight surrounding quads. Local lists of special-status species were compiled using CNDDB records from within five miles of the proposed Project site and species for which the Project site does not provide suitable habitat were eliminated from further consideration. Field surveys were conducted in April and May of 2018. As part of the intensive effort, biologists met with project design engineers and Groveland CSD staff on site to determine the specific limits of impact, method of construction and other relevant information in order to better evaluate the potential biological impacts of the Project. The results of these database searches and surveys are summarized herein and the full reports are included in Appendix B – Biological Resource Evaluation (May 2018).

Land Use and Habitats

The Project site consists of developed and disturbed land cover including roads, residential development, and commercial development. The surrounding land cover is composed of cismontane woodland. Intermittent and ephemeral waterways are present within 50 feet of each work location.

Observed Species

In total, 94 plant species (59 native and 35 nonnative) were found during the reconnaissance survey (See Table 2 of Appendix B). One amphibian species, 29 bird species, and four mammal species were also detected (Table 2 of Appendix B).

Nesting Birds and the Migratory Bird Treaty Act

Migratory birds are likely nest on or near the Project site. Species that may use the Project site or adjacent areas include, but are not limited to, red-shouldered hawk (*Buteo lineatus*), bushtit (*Psaltriparus minimus*), band-tailed pigeon (*Patagioenas fasciata*), mourning dove (*Zenaida macroura*), California scrub-jay (*Aphelocoma californica*), lesser goldfinch (*Spinus psaltria*), house finch (*Haemorhous mexicanus*), cliff swallow (*Petrochelidon pyrrhonota*), California towhee (*Melozone crissalis*), spotted towhee (*Pipilo maculatus*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), and Hutton's vireo (*Vireo huttoni*).

Regulated Habitats

Multiple Project work locations were within 50 feet of intermittent and ephemeral streams that are hydrologically connected to the Tuolumne River, a navigable waterway under the regulatory jurisdiction of the USACE, the RWQCB, and the CDFW. The Project will likely impact four of these jurisdictional waterways – three in Big Oak Flat, where work could involve trenching across an ephemeral tributary of Rattlesnake Creek, an intermittent drainage that ultimately drains to the Tuolumne River via Priest Reservoir, or installing concrete pillars on the banks of the high-flow channel of Rattlesnake Creek – and one in Groveland, where concrete pillars could be installed on the severely eroded banks of an unnamed intermittent stream that is tributary to the Tuolumne River above Pine Mountain Lake.

No marine or estuarine fishery resources or migratory routes to and from anadromous fish spawning grounds were present in the survey area; all tributaries to the Tuolumne River, the nearest potential migratory route for anadromous fishes, is effectively blocked by numerous manmade dams. In addition, no EFH, defined by the Magnuson-Stevens Act as those resources necessary for fish

spawning, breeding, feeding, or growth to maturity, were present in the survey area. And no federally protected wetlands, such as vernal pools, were found in the survey area.

The Project site is not within a flood plain (Federal Emergency Management Agency, 2018). The nearest flood plain limit is at Priest Reservoir, approximately 1.2 miles southwest of the Project site.

Special Status Species

A total of three special-status species have the potential to occur on or near the Project site based on the presence of suitable habitat and CNDDB occurrence records from within 5 miles (See Table 1 of Appendix B).

Northwestern pond turtle, western red bat, and Small's southern clarkia were identified in the desktop review as potentially occurring in the survey area due to the presence of suitable habitat conditions in the survey area (Table 1 of Appendix B).

The Project could have a substantial, direct adverse effect on northwestern pond turtle, a native reptile designated by the CDFW as a Species of Special Concern. Northwestern pond turtle uses a variety of aquatic habitats including streams, creeks, ponds, lakes, and canals for shelter, foraging, and basking and lays its eggs in uplands adjacent to these aquatic habitats. Because the Project will involve excavation and staging in and adjacent to multiple sections of intermittent and ephemeral streams that could support this species at some time during the year, incidental loss of animals or eggs from adjacent uplands nests could occur.

Western red bat uses trees, tree cavities, and peeling bark for roosting. Because no trees will be removed to facilitate water main installation activities, we conclude the Project will have no significant impact on this species. We also conclude the Project will have no impact on Small's southern clarkia, as the species was not found in the survey area during the flowering period. Additionally, we conclude that the Project will have a less than significant impact on other special status species due to the lack of habitat for such species in the survey area.

Implementation of the below mitigation measures will reduce any impacts to the northwestern pond turtle to ***less than significant***.

Mitigation Measures:

BIO – 1 Protect northwestern pond turtle

1. To the extent practicable, construction in and adjacent to intermittent and ephemeral streams shall be scheduled to occur when streams are dry (approximately mid-July through October) to avoid the possibility of northwestern pond turtle being present at the worksite.

2. If it is not possible to schedule construction between August and October, pre-construction surveys for northwestern pond turtle shall be conducted by a qualified biologist to determine if turtles are occupying stream-adjacent worksites. pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all sections of stream within 300 feet of planned work activities, including adjacent upland areas, for turtles and nests; northwestern pond turtle nests in upland areas within several hundred feet of water in the spring, typically during the months of April and May. If a turtle or nest is found within 300 feet of the worksite, a qualified biological monitor shall remain on site during construction to ensure that no turtles or turtle nests are impacted by work activities. Any turtle found on or adjacent to the worksite shall be allowed to leave on its own.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant Impact. The Project will impact one ephemeral drainage in Big Oak Flat that supports Himalayan blackberry (*Rubus armeniacus*), a nonnative vine that forms dense thickets in numerous settings, including riparian areas. Work activities will involve excavating an open trench across the drainage to replace the existing water main, and currently, Himalayan blackberry is growing on both banks and partly in the bed of the drainage. Although nonnative and highly invasive, Himalayan blackberry can serve as a surrogate to native riparian vegetation. Based on the abundance of this plant species in the local area, however, including on and adjacent to the impact area, recolonization after Project completion is expected to occur naturally and probably within one growing season. Therefore, Project-related impacts to riparian habitat will be negligible.

Additionally, Clean Water Act Section 404 permits and 401 certifications as well as California Fish and Game Code Section 1602 notifications are being prepared for four jurisdictional water ways – three in Big Oak Flat, where work could involve trenching across an ephemeral tributary of Rattlesnake Creek, an intermittent drainage that ultimately drains to the Tuolumne River via Priest Reservoir, or installing concrete pillars on the banks of the high-flow channel of Rattlesnake Creek – and one in Groveland, where concrete pillars could be installed on the severely eroded banks of an unnamed intermittent stream that is tributary to the Tuolumne River above Pine Mountain Lake. Groveland CSD will be

required to secure these permits prior to construction activities. These permits will outline the various restrictions and requirements of construction activities as they pertain to biological resources. For example, the permits will outline the limits of ground disturbance, timing of work within streambeds, location of construction staging areas, and other information. Preconstruction surveys and adherence to regulatory permit requirements will ensure that any impacts will be ***less than significant.***

Mitigation Measure: None required.

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

No Impact. There are no protected wetlands in the proposed Project vicinity. There is ***no impact***.

Mitigation Measure: None required.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant Impact with Mitigation. Migratory birds are expected to nest on and near the Project site. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment or loss of reproductive effort is considered take by the CDFW. Loss of fertile eggs or nesting birds, or any activities resulting in nest abandonment, could constitute a significant impact if the species is particularly rare in the region. Construction activities such as excavation, trenching, water main or water valve installation, and mobilizing or demobilizing construction equipment that disturb a nesting bird on the site or immediately adjacent to the construction zone could constitute a significant impact. Implementation of Mitigation Measure BIO-2 will reduce any potential impacts to ***less than significant***.

Mitigation Measure:

BIO – 2 Protect Nesting Birds

- To the extent feasible, construction shall be scheduled to avoid the nesting season, which extends from February through August.

- If it is not possible to schedule construction between September and January, pre-construction surveys for nesting birds shall be conducted by a qualified biologist to ensure that no active nests will be disturbed during Project implementation. A pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all potential nest substrates in and immediately adjacent to the impact areas for nests. If an active nest is found close enough to the construction area to be disturbed by these activities, the qualified biologist shall determine the extent of a construction-free buffer to be established around the nest. If work cannot proceed without disturbing the nesting birds, work may need to be halted or redirected to other areas until nesting and fledging are completed or the nest has otherwise failed for non-construction related reasons.

e.,f. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. Proposed project design is consistent with the goals and policies of the Tuolumne County General Plan. There are no adopted habitat conservation plans or natural community conservation plans in within the Groveland Community Services District. There are ***no impacts*** regarding this impact topic.

Mitigation. None required.

V. CULTURAL RESOURCES

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

RESPONSES

The Project is subject to the California Environmental Act (CEQA), which holds municipal and state agencies accountable for impacts to the cultural environment. If a project has the potential to cause substantial adverse change in the characteristics of an important cultural resource, known as a "historical resource" under CEQA—either through demolition, destruction, relocation, alteration, or other means—then the project is judged to have a significant impact on the environment (CEQA Guidelines, Section 15064.5[b]). Section 15064.5(a) of the CEQA Guidelines (as amended) defines a historical resource as one that: (1) is listed or determined eligible for listing in the California Register of Historical Resources (California Public Resources Code [PRC] Section 5024.1; Title 14, California Code of Regulations [CCR], Section 4852); (2) is included in a local register of historical resources (pursuant to Section 5020.1[k]) of the PRC) or identified as significant in a historical resources survey per the California Register eligibility criteria (PRC 5024.1[c]); or (3) is considered eligible by a lead agency under PRC 5020.1(j) or 5024.1. The definition subsumes a variety of resources, including prehistoric and historical archaeological sites, as well as built-environment resources, such as buildings, structures, and objects (CEQA Guidelines Section 15064.5[a][3] and Section 15064.5[c]). Given that the project will

involve ground-disturbing activities and demolition, it has the potential to impact historical resources, if present, within the Project area. In addition, because the proposed Project will be funded through the State Water Resources Control Board Safe Drinking Water State Revolving Fund, a joint federal-state program, it is federal undertaking per Title 36, Code of Federal Regulations, Section 800.16(y) subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (Title 54, U.S. Code, Section 306108). As such, the lead federal agency must consider whether a project will have an adverse effect on historic properties (i.e., resources that are eligible for inclusion on the National Register of Historic Places) within the Project Area of Potential Effects (APE).

To meet State and federal requirements, the CSD retained Sierra Valley Cultural Planning to conduct background research, complete a records search, request a search of the Native American Heritage Commission's Sacred Lands File and reach out to appropriate Native American contacts, conduct a cultural resources survey, and prepare a technical report, dated August 2018 (see Appendix C). The results of the Report are summarized herein and were used to support the determinations made in this CEQA document.

Native American Outreach

A Sacred Lands File Request was submitted to the Native American Heritage Commission (NAHC) in June 2018, who provided a list of applicable Native American Tribes. Tribal organizations on the NAHC contact list were sent letters requesting their concerns or the opportunity to consult on the project on August 11, 2018. Follow-up phone calls were completed by September 1, 2018. Copies of the consultation letters and a description of methods of contact are described in Appendix B of Appendix C.

Records Search and Site-Specific Research

An in-house records search (CCIC File # 10783/O) was completed on 26 July 2018 by SVCP archaeologist Douglas S. McIntosh with the assistance of staff of the Central California Information Center (CCIC) of the California Historical Resources Information System to identify areas previously investigated and to identify known cultural resources present within or in close proximity to the Project APE. This records search served to augment the 2016 records search (CCIC File # 10116 O) completed for the Groveland CSD Sewer Collection Service Project. Both records searches are included as Attachment A of Appendix C. According to the Information Center records, there are a minimum of 30 cultural resources within the general study area, and more than 60 resources within a 1/2-mile radius of the project study area. One historic-period site, the Big Oak Road (P-55-004140), is located within the project APE. California Historic Landmark #406 (P-55- 005093) which includes the town of Big Oak Flat is located adjacent to the APE. No other previously recorded cultural resources are

situated within the APE. There have been over 25 previous investigations within the study area, with over 55 additional studies within 1/2-mile radius of the APE; seven investigations have been completed within 1/4 mile of the APE. No cultural resource sites listed on the National Register of Historic Places, the California Register of Historic Resources, California Points of Historical Interest, or the California Inventory of Historic Resources have been documented within the Project APE.

Pedestrian Survey

On June 4, 2018, Sierra Valley Cultural Recourses archaeologists Douglas S. McIntosh, under the direction of Kristina Roper, conducted a reconnaissance-level archaeological survey of proposed new water main and replacement water main routes within the Groveland Community Services District. This survey was conducted in conjunction with a proposed water distribution system improvements project.

The cultural resources survey focused on proposed new water main and replacement water main routes as defined in the Groveland Community Services District Water Distribution Improvements Engineering Design Report (May 2017, Figures 4-1, 4-2, 4-3). GCSD employee Brandon Klein was instrumental in helping Mr. McIntosh locate, identify and inspect the proposed pipeline routes within the GCSD.

Based on these results, the Project does not have the potential to result in significant impacts or adverse effects to historical resources or historic properties.

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

Less than Significant Impact with Mitigation. As described in the Cultural Resources Report, the records search, background historical research, Native American outreach and a pedestrian survey revealed that no cultural resources occur on the Project site or in the Project area.

The survey did not result in the discovery or documentation of any previously unrecorded cultural resources within the APE. A majority of the proposed water pipeline routes are with asphalt paved or gravel covered road ways or along the edge State Highway 120. Two cultural resources located near the APE include the "Old Cemetery, 1849-1852, also known as Chinese Cemetery". A sign at the cemetery also states that "Early Day Chinese Also Buried Here". This small cemetery is surrounded by a low chain link fence and is located near the west end of the proposed new water main route at the western end of Henderson Road in the community of Big Oak Flat. UTM coordinates at the cemetery entrance are 10 741232E/ 4189869N (NAD 83). The other resource is the Groveland Jail. This structure is located along the northwest edge Ponderosa Lane, northwest of State Highway 120. The structure was constructed in 1895 in a neoclassic architectural style. See photos 9-11 and Maps 5-6 of Appendix C.

No other cultural resources were identified within the APE as a result of this study. Therefore, it is unlikely that the proposed action will have an effect on important archaeological, historical, or other cultural resources. No further cultural resources investigation is therefore recommended. In the unlikely event that buried archaeological deposits are encountered within the project area, the finds must be evaluated by a qualified archaeologist. Should human remains be encountered, the County Coroner must be contacted immediately; if the remains are determined to be Native American, then the Native American Heritage Commission must be contacted as well.

Unidentified cultural resources could be uncovered during proposed Project construction which could result in a potentially significant impact; however, implementation of Mitigation Measure CUL-1 would ensure that significant impacts remain ***less than significant with mitigation incorporation.***

> ***Mitigation Measure CUL-1:*** In the event that archaeological remains are encountered at any time during development or ground-moving activities within the entire Project area, all work in the vicinity of the find should be halted until a qualified archaeologist can assess the discovery and take appropriate actions as necessary.

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

Less than Significant Impact with Mitigation. The possibility exists that subsurface construction activities may encounter undiscovered archaeological resources. This would be a potentially significant impact. Implementation of Mitigation Measure CUL-1 would require inadvertently discovery practices to be implemented should previously undiscovered archeological resources be located. As such, impacts to undiscovered archeological resources would be ***less than significant with mitigation incorporation.***

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

Less than Significant Impact with Mitigation. Paleontological Resources

Paleontological resources are the fossilized remains of plants and animals and associated deposits. The Society of Vertebrate Paleontology has identified vertebrate fossils, their taphonomic and associated environmental indicators, and fossiliferous deposits as significant nonrenewable paleontological resources. Botanical and invertebrate fossils and assemblages may also be considered significant resources.

CEQA requires that a determination be made as to whether a project would directly or indirectly destroy a unique paleontological resource or site or unique geological feature (CEQA Appendix G(v)(c)). If an impact is significant, CEQA requires feasible measures to minimize the impact (CCR Title

14(3) §15126.4 (a)(1)). California Public Resources Code §5097.5 (see above) also applies to paleontological resources.

There are no unique geological features or known fossil-bearing sediments in the vicinity of the proposed Project site. However, there remains the possibility for previously unknown, buried paleontological resources or unique geological sites to be uncovered during subsurface construction activities. Implementation of Mitigation Measure CUL-1 would require inadvertently discovery practices to be implemented should previously undiscovered paleontological resources be located. As such, impacts to undiscovered paleontological resources would be ***less than significant with mitigation incorporation.***

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

Less than Significant Impact. Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper and dignified treatment of the remains and associated grave artifacts.

Although unlikely given the highly disturbed nature of the site and the records search did not indicate the presence of such resources, subsurface construction activities associated with the proposed Project could potentially disturb previously undiscovered human burial sites. Accordingly, this is a potentially significant impact. The California Health and Safety Code Section 7050.5 states that if human remains are discovered on-site, no further disturbance shall occur until the Merced County Coroner has made a determination of origin and disposition. If the Coroner determines that the remains are not subject to his or her authority and if the Coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the NAHC. The NAHC shall identify the person or persons it believes to be the "most likely descendant" (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resource Code Section 5097.98.

Although considered unlikely subsurface construction activities could cause a potentially significant impact to previously undiscovered human burial sites, however compliance with regulations would reduce this impact to ***less than significant***.

Mitigation Measures: None are required.

VI. GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the most recently	☐	☐	☒	☐

	adopted Uniform Building Code creating substantial risks to life or property?				
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☒	☐

RESPONSES

a-i. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant Impact. The proposed Project site is not located within a designated Alquist-Priolo Earthquake Fault zone or a seismically active zone.[5]**;** thus, the risk of surface fault ruptures within the area is low. Any impacts would be ***Less Than Significant.***

Mitigation Measures: None are required.

a (ii-iv). Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking, liquefaction or landslides?

Less than Significant Impact. The proposed Project site is not in an area recognized for severe seismic ground shaking, landslides or liquefaction.[6] Additionally, the project does not include the construction of substantial structures that would expose people or structures to adverse effects involving rupture of a known earthquake fault. Impacts would be ***less than significant.***

Mitigation Measures: None are required.

b. Result in substantial soil erosion or the loss of topsoil?

[5] California Department of Conservation. California Geological Survey. CGS Information Warehouse: Regulatory Maps. http://maps.conservation.ca.gov/cgs/informationwarehouse/. Accessed August 2018.
[6] Ibid.

Less than Significant Impact. The proposed Project site has a varied topography, but does not include any Project features that would result in soil erosion or loss of topsoil. Most of the project components will be located below grade. Once construction is completed, the pipeline trenches will be returned to pre-construction conditions and will not result in soil erosion greater than existing conditions. Therefore, the impact is ***less than significant***.

Mitigation Measures: None are required.

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less than Significant Impact. As described in Impact VI (aii-aiv), the potential for landslides, liquefaction, settlement or other seismically related hazards is low. As such, any impacts will be ***less than significant.***

Mitigation Measures: None are required.

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

Less than Significant Impact. As described above, the potential for hazard from landslide and liquefaction in the project area is low. Therefore, the potential for liquefaction induced lateral spreading is also low. Causes of soil instability include, but are not limited to, withdrawal of groundwater, pumping of oil and gas from underground, liquefaction, and hydro-compaction.[7] The proposed Project does not include the on-site withdrawal of groundwater and the project site is not located in an area that has been subjected to activities that might cause soil instability. Because the project site has not been subject to activities that may cause soil instability, the risk of subsidence or collapse is expected to be low. Any impacts would be ***less than significant.***

Mitigation Measures: None are required.

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

[7] USGS. California Water Science Center. Land Subsidence: Cause & Effect. https://ca.water.usgs.gov/land_subsidence/california-subsidence-cause-effect.html. Accessed August 2018.

Less Than Significant Impact. The proposed Project would not generate wastewater requiring disposal. No septic tanks or alternative waste water disposal systems are included in the proposed Project. The project has been designed to work with the soil types in the District. Therefore, there would be a ***less than significant impact.***

Mitigation Measures: None are required.

VII. GREENHOUSE GAS EMISSIONS

Would the project:

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

RESPONSES

a., b. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact. The proposed Project would generate exhaust-related GHG emissions during construction resulting from construction equipment operation, material haul and delivery trucks, and by trips by construction worker vehicles. Construction-related GHG emissions would occur for approximately twelve months and would cease following completion of the Project. The proposed Project is not a land-use development project that would generate vehicle trips and is not a roadway capacity increasing project that could carry additional VMT. Therefore, the proposed Project would not result in a net increase in operational GHG emissions. As such, the proposed Project would not interfere or obstruct implementation of an applicable GHG emissions reduction plan. The proposed Project would be consistent with all applicable local plans, policies, and regulations for reducing GHG emissions. Any impacts related to GHG emissions would be ***less than significant.***

Mitigation Measures: None are required.

VIII. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project result in	☐	☐	☐	☒

	a safety hazard for people residing or working in the project area?				
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h.	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	☐	☐	☐	☒

RESPONSES

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

Less than Significant Impact. While trenching and construction activities may involve the limited transport, storage, use or disposal of hazardous materials, such as the fueling/servicing of construction equipment onsite, the activities would be short-term or one-time in nature and would be subject to federal, state, and local health and safety regulations.

Long-term operation of the proposed Project would involve little or no hazardous materials. Once operational, the pipelines will transport water and will not emit hazardous materials.

With implementation of the proposed Project, there are no reasonably foreseeable upset and accident conditions that would create a significant hazard to the public due to the release of hazardous materials. Impacts are considered ***less than significant***.

Mitigation Measures: None are required.

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

Less than Significant Impact. See Impact VIII (a) above. Any impacts would be ***less than significant***.

Mitigation Measures: None are required.

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

No Impact. Tenaya Elementary School is located on State Highway 120, approximately 0.3 miles to the northwest of the proposed Project site. Additionally, the project does not include emission of hazardous materials. There is ***no impact.***

Mitigation Measures: None are required.

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. The proposed Project site is not located on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5.[8] The nearest location is a closed mine site located at the corner of Cedar and Elm Streets in Tuolumne, over ten miles to the north. The State Emergency Response Unit conducted the removal of approximately 100 cubic yards of arsenic, mercury, and lead contaminated soil, and the removal of 80 cubic yards of mine debris and brush. Cleanup status is certified as of 6/30/1999. The project is not impacted by the facility and as such, there is ***no impact.***

Mitigation Measures: None are required.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The nearest public airport, Pine Mountain Lake Airport, is located approximately three miles northeast of Groveland. The proposed Project is not located within any airport safety zone.

The Project will have ***no impact*** to airport operations.

Mitigation Measures: None are required.

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

Less Than Significant Impact. See response to Impact VIII (e). Any impacts would be ***less than significant.***

[8] California Department of Toxic Substance Control. EnviroStor. https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=groveland Accesed August 2018.

Mitigation Measures: None are required.

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

Less Than Significant Impact. Pipeline installation will be temporary in nature and will not cause any road closures that could interfere with any adopted emergency response or evacuation plan. As such, any impacts will be ***less than significant***.

Mitigation Measures: None are required.

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

No Impact. As the proposed Project site is an urbanized area, there are no wildland areas adjacent in proximity to the proposed Project site. There is ***no impact***.

Mitigation Measures: None are required.

IX. HYDROLOGY AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or	☐	☐	☐	☒

IX. HYDROLOGY AND WATER QUALITY

Would the project:

		Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
	provide substantial additional sources of polluted runoff?				
f.	Otherwise substantially degrade water quality?	☐	☐	☒	☐
g.	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h.	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i.	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j.	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

RESPONSES

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

Less than Significant Impact. The proposed Project includes improvements to the water infrastructure system. The Project does not include any water treatment facilities or processes that would result in the production of chemicals or substances that would adversely impact local water quality. The project will not result in any additional water releases that could potentially impact groundwater or water quality. Construction activities near creeks and streams could potentially impact water quality due to runoff, or

changes in streambeds. However, all activities will be conducted under the requirements and restrictions of the regulatory permits that will be required for the Project (most notably the RWQCB 401/404 permit which ensures appropriate measures are taken to preserve water quality). Best Management Practices pertaining to stormwater runoff from construction activities will also be enforced. Refer to Section IV – Biological Resources for information pertaining to regulatory permits and water quality. The State Water Resources Control Board will have ultimate review and approval of the upgraded system, thereby ensuring adequate water quality standards. There are no aspects of the Project that would result in changes to waste discharge requirements. Any impacts would be ***less than significant***.

Mitigation Measures: None are required.

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

Less Than Significant Impact. The Project is an upgrade to the existing water distribution system and will not use additional groundwater beyond what is already being used by the District. Additionally, the proposed Project will not significantly interfere with groundwater recharge as it will introduce minimal amounts of impermeable surfaces. As such, any impacts to groundwater supplies will be ***less than significant***.

Mitigation Measures: None are required.

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

Less than Significant Impact. The proposed improvements to the existing community water system will introduce minimal non-permeable surfaces such as concrete footings and other above-ground small structures. The pipelines and other improvements will be installed underground within the existing road right-of-way, or other easements and will not alter any existing drainage patterns. There are no waterways in the immediate vicinity of the proposed Project. Any impacts would be ***less than significant.***

Mitigation Measures: None are required.

e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

No Impact. Implementation of the proposed Project will not require expansion of the District's existing stormwater system, nor will it result in additional sources of polluted runoff. There is ***no impact.***

Mitigation Measures: None are required.

f. Otherwise substantially degrade water quality?

Less than Significant Impact. See Impact IX (a), (c) and (d). The Project is intended to improve the City's water distribution system and would not otherwise degrade water quality and therefore the impact is ***less than significant***.

Mitigation Measures: None are required.

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

No Impact. Most of the District is in Flood Zone X (Outside the 100-year flood zone). However, small portions of the District are in Flood Zone D (as identified by FEMA Flood Insurance Rate Map 06109C1225C, accessed August 2018). However, there is no housing associated with the project and therefore, there is ***no impact***.

Mitigation Measures: None are required.

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

Less Than Significant Impact. Most of the District is in Flood Zone X (Outside the 100-year flood zone). However, small portions of the District are in Flood Zone D (as identified by FEMA Flood Insurance Rate Map 06109C1225C, accessed August 2018).[9] The proposed pipelines will be underground, while the hydrants and appurtenances will be above grade. The structures are not substantial enough to impede or redirect any flood flows. Therefore, there is a ***less than significant impact***.

Mitigation Measures: None are required.

[9] FEMA. FEMA Flood Map Service Center: Search By Address. Search Results for Tuolumne County Unincorporated Areas. https://msc.fema.gov/portal/search?AddressQuery=groveland%20ca#searchresultsanchor. Accessed August 2018.

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

Less than Significant Impact. The District is not located in any dam inundation zone and there are no large bodies of water near the site. The Division of Safety of Dams, a division of the California Department of Water Resources, inspects dams under State jurisdiction on a periodic basis for structural integrity and as such, the probability of a failure of a major dam in California is very remote. As such, impacts related to exposure of people or structures to a risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam would be ***less than significant***.

Mitigation Measures: None are required.

j. Inundation by seiche, tsunami, or mudflow?

No Impact. There are no inland water bodies that could be potentially susceptible to a seiche in the Project vicinity. This precludes the possibility of a seiche inundating the Project site. The Project site is more than 120 miles from the Pacific Ocean, a condition that precludes the possibility of inundation by tsunami. There are no steep slopes that would be susceptible to a mudflow in the Project vicinity, nor are there any volcanically active features that could produce a mudflow in the District. This precludes the possibility of a mudflow inundating the Project site. ***No impacts*** would occur.

Mitigation Measures: None are required.

X. LAND USE AND PLANNING

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	☐	☒
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the General Plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

RESPONSES

a. Physically divide an established community?

No Impact. The proposed Project is located largely within the existing streetscape within the Groveland Community Services District, as presented in Figure 2 – Vicinity Map. The construction of the water lines and appurtenances would not cause any land use changes in the surrounding vicinity nor would it divide an established community. ***No impacts*** would occur as a result of Project implementation.

Mitigation Measures: None are required.

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

No Impact. The proposed Project involves improvements to the existing water infrastructure system and does not conflict with any land use plans, policies or regulations. There are ***no impacts.***

Mitigation Measures: None are required.

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

No Impact. The proposed Project site is not included in any adopted habitat conservation plans or natural community conservation plans. Therefore, the proposed Project would not conflict with any such plans and ***no impacts*** would result.

Mitigation Measures: None are required.

XI. MINERAL RESOURCES

Would the project:

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

RESPONSES

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The proposed Project includes improvements to the existing water infrastructure system. Construction will take place within the existing streetscape and not in an area with known mineral resources. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. As stated in the analysis for Impact XI(a), there are no mineral resources within the Project area. Additionally, the proposed Project will occur in the existing streetscape. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XII. NOISE

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

RESPONSES

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

Less than Significant Impact. The nearest sensitive receptors to the proposed Project would be the residences along the existing pipeline alignment, as presented on Figure 2 – Vicinity Map. Project construction would involve temporary, short-term noise sources including site preparation and installation of the pipeline and site cleanup work is expected to last for approximately one year. Construction-related short-term, temporary noise levels would be higher than existing ambient noise levels in the Project area, but is temporary and would not occur after construction is completed.

Operations-related noise would be similar to existing conditions. The pipelines themselves do not emit noise, nor do the related improvements such as fire hydrants and valves. As such, any impacts to sensitive receptors would be ***less than significant.***

Mitigation Measures: None are required.

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

Less than Significant Impact. Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Construction vibrations can be transient, random, or continuous. Construction associated with the proposed Project is earthmoving activities associated installing pipelines and installing equipment.

The approximate threshold of vibration perception is 65 VdB, while 85 VdB is the vibration acceptable only if there are an infrequent number of events per day.[10] The FTA has identified the human annoyance response to vibration levels as 80 RMS.[11]

Table 2 describes the typical construction equipment vibration levels.

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[10] Transit Noise and Vibration Impact Assessment. Final Report No. FTA-VA-90-1003 prepared for the U.S. Federal Transit Administration by Harris Miller Miller & Hanson Inc., May 2006. Page 7-5. http://www.rtd-fastracks.com/media/uploads/nm/14_Section_38_NoiseandVibration_Part3.pdf. Accessed August 2018.

[11] U.S. Federal Transit Administration. Transit Noise and Vibration Impact Assessment. Final Report No. FTA-VA-90-1003 prepared by Harris Miller Miller & Hanson Inc., May 2006. Page 7-5. http://www.rtd-fastracks.com/media/uploads/nm/14_Section_38_NoiseandVibration_Part3.pdf. Accessed August 2018.

Table 2
Typical Construction Vibration Levels

Equipment	VdB at 25 ft
Small Bulldozer	58
Jackhammer	79

Vibration from construction activities will be temporary and not exceed the Federal Transit Authority threshold for the nearest residences which is located along the pipeline alignments. Additionally, short-term groundborne vibration impacts would not be anticipated to result in structural damage to nearby structures or increased levels of annoyance to occupants of these nearby dwellings. The impact will be ***less than significant***.

Mitigation Measures: None are required.

c., d. A substantial temporary or permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant Impact. See Impact XII (a). There will be no substantial temporary or permanent increase in ambient noise levels and therefore the impact is ***less than significant***.

Mitigation Measures: None are required.

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

No Impact. The proposed Project is not located in the vicinity of an airport. Therefore, there would be *no impact*.

Mitigation Measures: None are required.

XIII. POPULATION AND HOUSING

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

RESPONSES

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

No Impact. The proposed Project includes improvements to the District's water infrastructure system to ensure adequate pressure and quality to its existing users. The proposed Project will not require a significant amount of (if any) new employees. As such, the proposed Project would not directly or indirectly induce population growth. There is ***no impact***.

Mitigation Measures: None are required.

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

No Impact. The proposed water infrastructure system will be located within streets, easements and other public areas within the Groveland Community Services District. No housing will be affected. ***No impact*** would occur.

Mitigation Measures: None are required.

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

No Impact. The proposed Project will not displace any people and therefore there is ***no impact***.

Mitigation Measures: None are required.

XIV. PUBLIC SERVICES

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

RESPONSES

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?

No Impact. The proposed Project would improve the existing community water system. The proposed Project would not directly or indirectly induce population growth and the Groveland Community Services Fire Department would continue to provide service to the site. There is ***no impact.***

Police Protection?

No Impact. The proposed Project will continue to be served by the Tuolumne County Sheriff Station. No additional police personnel or equipment is anticipated. There is ***no impact.***

Schools, Parks, Other Public Facilities?

No Impact. The proposed Project would not increase the number of residents in the District, as the Project does not include residential units. Because the demand for schools, parks, and other public facilities is driven by population, the proposed Project would not increase demand for those services. As such, the proposed Project would result in ***no impacts.***

Mitigation Measures: None are required.

XV. RECREATION

Would the project:

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

RESPONSES

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

No Impact. The proposed Project does not include the construction of residential uses and would not directly or indirectly induce population growth. Therefore, the proposed Project would not cause physical deterioration of existing recreational facilities from increased usage or result in the need for new or expanded recreational facilities. The Project would have ***no impact*** to existing parks.

Mitigation Measures: None are required.

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

No Impact. The proposed Project does not include the construction of residential uses and would not directly induce population growth. Therefore, the Project would not cause physical deterioration of existing recreational facilities from increased usage or result in the need for new or expanded recreational facilities. There is ***no impact***.

Mitigation Measures: None are required.

XVI. TRANSPORTATION/ TRAFFIC

Would the project:

		Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a.	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b.	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d.	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e.	Result in inadequate emergency access?	☐	☐	☐	☒

f.	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

RESPONSES

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

No Impact. The proposed Project would not cause a substantial increase in traffic, reduce the existing level of service, or create any additional congestion at any intersections. The construction of pipelines and appurtenances will not generate any additional traffic and as such, level of service standards would not be exceeded. The proposed Project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system. There is ***no impact***.

Mitigation Measures: None are required.

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

No Impact. As shown in Response a., the proposed Project will have ***no impact*** on any existing level of service or other travel demand measures. The proposed Project will not conflict with any congestion management programs, as none are applicable to the Project.

Mitigation Measures: None are required.

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

No Impact. The nearest airport to the Project site is the Pine Mountain Lake Airport, approximately three miles northeast. The proposed Project is not located within any airport safety zone. As such, there is ***no impact***.

Mitigation Measures: None are required.

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

No Impact. No roadway design features are associated with this proposed Project that would result in an increase in hazards due to a design feature or be an incompatible use. See also Impact XVI (a). There is ***no impact.***

Mitigation Measures: None are required.

XVII. TRIBAL CULTURAL RESOURCES

Would the project:

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

RESPONSES

a). Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape

that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

ii)A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less Than Significant Impact. In accordance with Public Resources Code Section 21080.3.1 - Assembly Bill (AB) 52, potentially affected Tribes were formally notified of this Project and were given the opportunity to request consultation on the Project.

A Sacred Lands File Request was submitted to the Native American Heritage Commission (NAHC) in June 2018, who provided a list of applicable Native American Tribes. Tribal organizations on the NAHC contact list were sent letters requesting their concerns or the opportunity to consult on the project on August 11, 2018. Follow-up phone calls were completed by September 1, 2018. Copies of the consultation letters and a description of methods of contact are described in Appendix B of Appendix C.

The following Tribes were consulted based on the list provided by the NAHC:

- Chicken Ranch Rancheria of Me-Wuk Indians
- Tuolumne Band of Me-Wuk Indians
- Washoe Tribe of Nevada and California

Pursuant to AB 52, a 30-day period was allowed in order to receive any comments or input from any Tribe. As of September 14, 2018 no Tribe has responded and therefore the District has complied with the provisions of Public Resources Code Section 21080.3.2.

Therefore, there is a ***less than significant impact***.

Mitigation Measures: None are required.

XVII. UTILITIES AND SERVICE SYSTEMS

Would the project:

		Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐
c.	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e.	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g.	Comply with federal, state, and local	☐	☐	☐	☒

statutes and regulations related to solid waste?

RESPONSES

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

Less Than Significant Impact. The proposed Project includes improvements to the District's existing water distribution system, the results of which would not exceed any wastewater treatment requirements set by the Central Valley Regional Water Quality Control Board. ***Less Than Significant Impacts*** related to these utilities and service systems would occur.

Mitigation Measures: None are required.

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

Less Than Significant Impact With Mitigation. The Project itself is the construction of an improved water distribution system, environmental impacts resulting from the improvements are discussed within this document.

Mitigation Measures: The Project will require multiple mitigation measures as identified throughout this document.

c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant. As discussed in Impact IX (c,d), the proposed improvements to the community water distribution system would not increase the amount of impermeable surfaces which would necessitate the expansion of existing stormwater facilities.

Any impacts would be ***less than significant.***

Mitigation Measures: None are required.

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

No Impact. The proposed Project includes improving the existing water distribution system. No new water supplies would be required as a result of this Project. There is ***no impact.***

Mitigation Measures: None are required.

e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The proposed Project includes improvements to the water distribution system. No component of the proposed Project would generate wastewater. There is ***no impact.***

Mitigation Measures: None are required.

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

Less than Significant Impact. Proposed Project construction will generate minimal amounts of solid waste. Once operational, the water system will not itself generate any solid waste. Any impacts will be ***less than significant.***

Mitigation Measures: None are required.

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

No Impact. The proposed Project will comply with all federal, state and local statutes and regulations related to solid waste. There is ***no impact.***

Mitigation Measures: None are required.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:

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

RESPONSES

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less than Significant Impact With Mitigation. The analyses of environmental issues contained in this Initial Study indicate that the proposed Project is not expected to have substantial impact on the environment or on any resources identified in the Initial Study. Mitigation measures have been incorporated in the project design to reduce all potentially significant impacts to ***less than significant***.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less than Significant Impact. CEQA Guidelines Section 15064(i) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. Due to the nature of the Project and consistency with environmental policies, incremental contributions to impacts are considered less than cumulatively considerable. The proposed Project would not contribute substantially to adverse cumulative conditions, or create any substantial indirect impacts (i.e., increase in population could lead to an increase need for housing, increase in traffic, air pollutants, etc). The impact is ***less than significant***.

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

Less than Significant Impact With Mitigation. The analyses of environmental issues contained in this Initial Study indicate that the project is not expected to have substantial impact on human beings, either directly or indirectly. Mitigation measures have been incorporated in the Project design to reduce all potentially significant impacts to ***less than significant.***

Chapter 4

MITIGATION MONITORING & REPORTING PROGRAM

MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) for the Groveland Community Services District Water Distribution System Improvements Project. The MMRP lists mitigation measures recommended in the IS/MND for the proposed Project and identifies monitoring and reporting requirements as well as conditions recommended by responsible agencies who commented on the project.

The first column of the Table identifies the mitigation measure. The second column, entitled "Party Responsible for Implementing Mitigation," names the party responsible for carrying out the required action. The third column, "Implementation Timing," identifies the time the mitigation measure should be initiated. The fourth column, "Party Responsible for Monitoring," names the party ultimately responsible for ensuring that the mitigation measure is implemented. The last column will be used by the Groveland CSD to ensure that individual mitigation measures have been monitored.

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
Biological Resources				
BIO – 1 Protect northwestern pond turtle 1. To the extent practicable, construction in and adjacent to intermittent and ephemeral streams shall be scheduled to occur when streams are dry (approximately mid-July through October) to avoid the possibility of northwestern pond turtle being present at the worksite. 2. If it is not possible to schedule construction between August and October, pre-construction surveys for northwestern pond turtle shall be conducted by a qualified biologist to determine if turtles are occupying stream-adjacent worksites. pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all sections of stream within 300 feet of planned work activities, including adjacent upland areas, for turtles and nests; northwestern pond turtle nests in upland areas within several hundred feet of water in the spring, typically during the months of April and May. If a turtle or nest is found within 300 feet of the worksite, a qualified biological monitor shall	Groveland CSD	Prior to construction	Groveland CSD	

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
remain on site during construction to ensure that no turtles or turtle nests are impacted by work activities. Any turtle found on or adjacent to the worksite shall be allowed to leave on its own.				
BIO – 2 Protect Nesting Birds • To the extent feasible, construction shall be scheduled to avoid the nesting season, which extends from February through August. • If it is not possible to schedule construction between September and January, pre-construction surveys for nesting birds shall be conducted by a qualified biologist to ensure that no active nests will be disturbed during Project implementation. A pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all potential nest substrates in and immediately adjacent to the impact areas for nests. If an active nest is found	Groveland CSD	Prior to construction	Groveland CSD	

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
close enough to the construction area to be disturbed by these activities, the qualified biologist shall determine the extent of a construction-free buffer to be established around the nest. If work cannot proceed without disturbing the nesting birds, work may need to be halted or redirected to other areas until nesting and fledging are completed or the nest has otherwise failed for non-construction related reasons.				
Cultural Resources				
Measure CUL-1 In the event that archaeological remains are encountered at any time during development or ground-moving activities within the entire Project area, all work in the vicinity of the find should be halted until a qualified archaeologist can assess the discovery and take appropriate actions as necessary.	Groveland CSD	Prior to construction	Groveland CSD	

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)

Chapter 5

PREPARERS

LIST OF PREPARERS

Crawford & Bowen Planning, Inc.

- Travis Crawford, AICP, Principal Environmental Planner
- Emily Bowen, LEED AP, Principal Environmental Planner

AM Consulting Engineers

- Alfonso Manrique, PE
- Angela Costanzo

Colibri Ecological Consulting, LLC.

- Jeff Davis

Sierra Valley Cultural Planning

- C. Kristina Roper, M.A., RPA

Appendices

Appendix A

Air Emission Output Tables

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Groveland Water Distribution System Improvements

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	2.07	15.52	19.79	10.88	0.88	10.00	2.86	0.78	2.08	0.03	3,253.25	0.66	0.04	3,280.71
Grading/Excavation	8.44	62.66	88.83	14.42	4.42	10.00	6.09	4.01	2.08	0.11	11,000.88	2.92	0.11	11,106.21
Drainage/Utilities/Sub-Grade	5.32	40.32	48.73	12.73	2.73	10.00	4.60	2.52	2.08	0.07	6,805.55	1.29	0.07	6,858.17
Paving	2.77	23.16	24.28	1.49	1.49	0.00	1.33	1.33	0.00	0.04	3,929.18	0.82	0.04	3,962.81
Maximum (pounds/day)	8.44	62.66	88.83	14.42	4.42	10.00	6.09	4.01	2.08	0.11	11,000.88	2.92	0.11	11,106.21
Total (tons/construction project)	0.39	2.92	3.84	0.76	0.20	0.56	0.30	0.18	0.12	0.01	508.00	0.12	0.01	512.51

Notes:

Project Start Year ->	2018
Project Length (months) ->	6
Total Project Area (acres) ->	7
Maximum Area Disturbed/Day (acres) ->	1
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	760	40
Grading/Excavation	0	0	0	0	1,360	40
Drainage/Utilities/Sub-Grade	0	0	0	0	1,120	40
Paving	0	0	0	0	960	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Groveland Water Distribution System Improvements

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.10	0.13	0.07	0.01	0.07	0.02	0.01	0.01	0.00	21.47	0.00	0.00	19.64
Grading/Excavation	0.22	1.65	2.35	0.38	0.12	0.26	0.16	0.11	0.05	0.00	290.42	0.08	0.00	265.99
Drainage/Utilities/Sub-Grade	0.12	0.93	1.13	0.29	0.06	0.23	0.11	0.06	0.05	0.00	157.21	0.03	0.00	143.72
Paving	0.03	0.23	0.24	0.01	0.01	0.00	0.01	0.01	0.00	0.00	38.90	0.01	0.00	35.59
Maximum (tons/phase)	0.22	1.65	2.35	0.38	0.12	0.26	0.16	0.11	0.05	0.00	290.42	0.08	0.00	265.99
Total (tons/construction project)	0.39	2.92	3.84	0.76	0.20	0.56	0.30	0.18	0.12	0.01	508.00	0.12	0.01	464.95

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Appendix B

Biological Report

Biological Resource Evaluation

Water Distribution System Improvements

Tuolumne County, California

PREPARED FOR:

Groveland Community Services District
18966 Ferretti Road
Groveland, CA 95321

PREPARED BY:

Colibri Ecological Consulting, LLC
9493 N Fort Washington Road, Suite 108
Fresno, CA 93730
www.colibri-ecology.com

Colibri
Ecological Consulting, LLC

May 2018

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Executive Summary

The Groveland Community Services District (District) proposes to install new water main pipelines (water mains) and replace existing water mains that serve the communities of Big Oak Flat, Groveland, and White Gulch. Existing water mains need to be replaced to improve water reliability, meet fire-flow requirements, and avoid frequent service interruptions associated with water main breaks. Approximately 10,203 linear feet of 8-inch diameter water main as well as new gate valves, pressure reducing valves, and four fire hydrants will be installed or replaced in the downtown Groveland water distribution system. Approximately 10,306 linear feet of 8-inch diameter water main as well as new gate valves, pressure reducing valves, and nine fire hydrants will be installed or replaced in the Big Oak Flat water distribution system. Approximately 7212 linear feet of 8-inch water main and two fire hydrants will be installed in the connection between the communities of Groveland and Big Oak Flat. And approximately 1956 linear feet of 8-inch water main and one fire hydrant will be replaced in the water distribution system that feeds White Gulch.

The District will obtain financing for the project from the Drinking Water State Revolving Fund (DWSRF). The DWSRF is a state and federal partnership that helps ensure safe drinking water. It is administered by the State of California and partially funded by the United States Environmental Protection Agency. Consequently, the project must not only meet environmental documentation and review requirements under the California Environmental Quality Act (CEQA) but must meet such requirements with respect to certain federal laws and regulations as well. This state and federal review process is known as CEQA-Plus.

To evaluate whether the project may affect biological resources under CEQA-Plus purview, we (1) obtained official lists from the United States Fish and Wildlife Service and the California Department of Fish and Wildlife of special-status species and designated and proposed critical habitat, (2) reviewed other relevant background information such as aerial images and topographic maps, and (3) conducted field reconnaissance surveys of the project site.

This biological resource evaluation summarizes existing biological conditions on the project site, the potential for special-status species and regulated habitats to occur on or near the project site, the potential impacts of the proposed project on biological resources and regulated habitats, and measures to reduce those potential impacts to a less-than-significant level under CEQA. We concluded the project could affect one special-status species and nesting migratory birds, but effects can be reduced to less-than-significant levels with mitigation. The project will also adversely affect regulated habitats but none that fall under CEQA-Plus purview.

Abbreviations

Abbreviation	Definition
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
DPS	Distinct Population Segment
DWSRF	Drinking Water State Revolving Fund
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
FC	Federal Candidate for listing
FE	Federally listed as Endangered
FESA	Federal Endangered Species Act
FP	Fully Protected
FT	Federally listed as Threatened
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
SE	State-listed as Endangered
SSSC	State Species of Special Concern
ST	State-listed as Threatened
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 Introduction

1.1 Background

The Groveland Community Services District (District) proposes to install and replace water mains and associated infrastructure in the communities of Big Oak Flat, Groveland, and White Gulch. The District will obtain financing for this water distribution systems improvement project (Project) from the Drinking Water State Revolving Fund (DWSRF). The DWSRF is administered by the State Water Resources Control Board and partially funded by a capitalization grant from the United States Environmental Protection Agency (EPA). Due to this federal nexus, issuing funds from the DWSRF constitutes a federal action, one that requires the EPA to determine whether the proposed action may affect federally protected resources. The Project must therefore comply with requirements of both the California Environmental Quality Act (CEQA) and certain federal environmental laws and regulations. This state and federal review process is known as CEQA-Plus.

The purpose of this biological resource evaluation is to assess whether the Project will affect state- or federally protected resources pursuant to CEQA-Plus guidelines. Such resources include species of plants or animals listed or proposed for listing under the Federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA), as well as those covered under the Migratory Bird Treaty Act (MBTA), the California Native Plant Protection Act, and various other sections of the California Fish and Game Code. Biological resources considered here also include designated or proposed critical habitat recognized under the FESA. This biological resource evaluation also addresses Project-related impacts to regulated habitats, which are those under the jurisdiction of the United States Army Corps of Engineers (USACE) or California Department of Fish and Wildlife (CDFW), as well as those addressed under the Wild and Scenic Rivers Act, Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and Executive Order 11988 pertaining to floodplain management.

1.2 Project Description

The Project involves installing or replacing approximately 10,203 linear feet of 8-inch diameter water main as well as new gate valves, pressure reducing valves, and four fire hydrants in the downtown Groveland water distribution system; approximately 10,306 linear feet of 8-inch diameter water main as well as new gate valves, pressure reducing valves, and nine fire hydrants in the Big Oak Flat water distribution system; approximately 7212 linear feet of 8-inch water main and two fire hydrants in the connection between the communities of Groveland and Big Oak Flat; and approximately 1956 linear feet of 8-inch water main and one fire hydrant in the water distribution system that feeds White Gulch.

1.3 Project Location

The Project will occur in three adjacent communities in western Tuolumne County, California: Big Oak Flat, Groveland, and White Gulch (Figures 1-4) at elevations ranging from about 2800 feet to about 3100 feet above mean sea level.

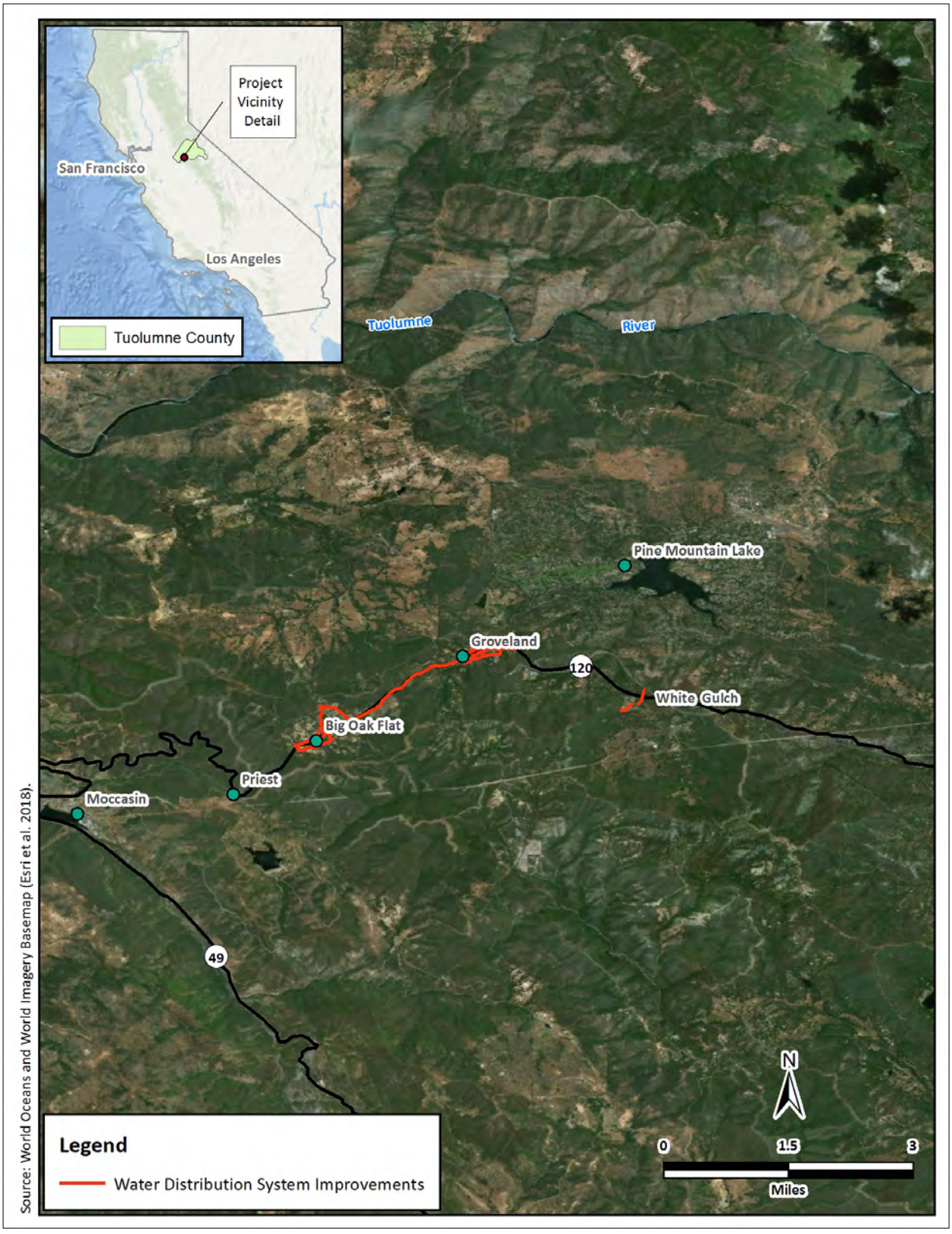

Figure 1. Site vicinity map.

Figure 2. Big Oak Flat Project location map.

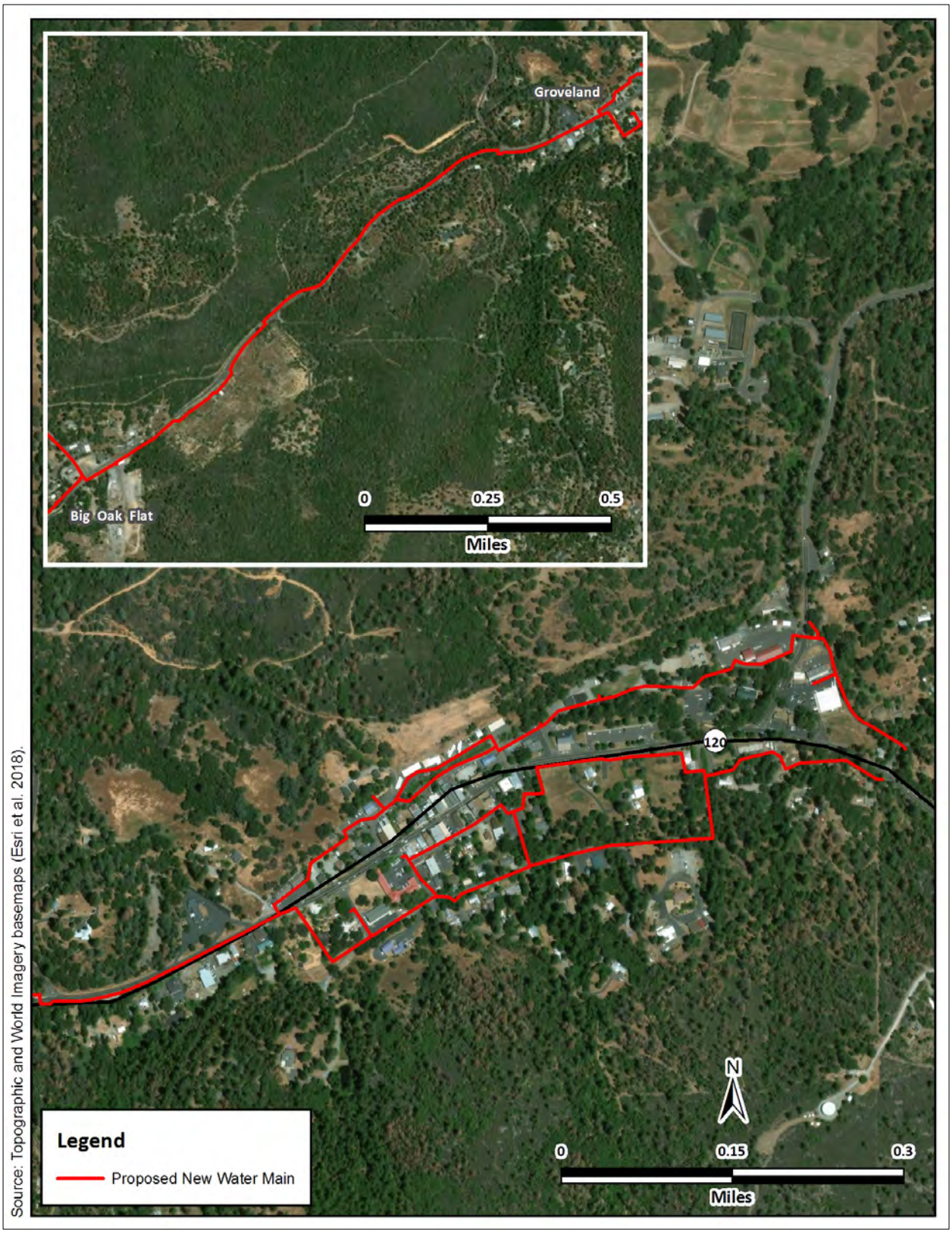

Figure 3. Groveland Project location map.

Figure 4. White Gulch Project location map.

1.4 Purpose and Need of Proposed Project

The purpose of this Project is to ensure that the communities served by the District have access to clean drinking water. The Project is needed to effectively distribute the District's water supply and ensure sufficient water pressure is available for multiple uses.

1.5 Consultation History

Lists of all species listed or proposed for listing as threatened or endangered and all designated or proposed critical habitat under the FESA that could occur near the Project site were obtained by Colibri Staff Scientist Kristofer Robison from the United States Fish and Wildlife Service (USFWS) website (https://ecos.fws.gov/ipac/) on 16 April 2018 (Appendix A).

1.6 Regulatory Framework

The relevant federal and state regulatory requirements and policies that guide the impact analysis of the Project are summarized below.

1.6.1 Federal Requirements

Federal Endangered Species Act. The USFWS and the National Oceanographic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) enforce the provisions stipulated in the Federal Endangered Species Act of 1973 (FESA, 16 USC Section 1531 et seq.). Threatened and endangered species on the federal list (50 Code of Federal Regulations [CFR] 17.11 and 17.12) are protected from take unless a Section 10 permit is granted to an entity other than a federal agency or a Biological Opinion with incidental take provisions is rendered to a federal lead agency via a Section 7 consultation. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Pursuant to the requirements of the FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present on the project site and determine whether the proposed project may affect such species. Under the FESA, habitat loss is an impact to a species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species that is listed or proposed for listing under the FESA or result in the destruction or adverse modification of critical habitat proposed or designated for such species (16 USC §1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant and would require mitigation.

Migratory Bird Treaty Act. The federal Migratory Bird Treaty Act (MBTA) (16 United States Code [USC] §703, Supp. I, 1989) prohibits killing, possessing, trading, or other forms of take of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. "Take" is defined as the pursuing, hunting, shooting, capturing, collecting, or killing of birds, their

nests, eggs, or young (16 USC §703 and §715n). This act encompasses whole birds, parts of birds, and bird nests and eggs. The MBTA specifically protects migratory bird nests from possession, sale, purchase, barter transport, import, and export, and take. For nests, the definition of take per 50 CFR 10.12 is to collect. The MBTA does not include a definition of an "active nest." However, the "Migratory Bird Permit Memorandum" issued by the USFWS in 2003 clarifies the MBTA in that regard and states that the removal of nests, without eggs or birds, is legal under the MBTA, provided no possession (which is interpreted as holding the nest with the intent of retaining it) occurs during the destruction (USFWS 2003).

United States Army Corps of Engineers Jurisdiction. Areas meeting the regulatory definition of "waters of the United States" (jurisdictional waters) are subject to the jurisdiction of the United States Army Corps of Engineers (USACE) under provisions of Section 404 of the Clean Water Act (1972) and Section 10 of the Rivers and Harbors Act (1899). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as waters of the United States, tributaries of waters otherwise defined as waters of the United States, the territorial seas, and wetlands adjacent to waters of the United States (33 CFR part 328.3). Ditches and drainage canals where water flows intermittently or ephemerally are not regulated as waters of the United States. Wetlands on non-agricultural lands are identified using the *Corps of Engineers Wetlands Delineation Manual* and related Regional Supplement (USACE 1987 and 2008). Construction activities, including direct removal, filling, hydrologic disruption, or other means in jurisdictional waters are regulated by the USACE. The placement of dredged or fill material into such waters must comply with permit requirements of the USACE. No USACE permit will be effective in the absence of state water quality certification pursuant to Section 401 of the Clean Water Act. The State Water Resources Control Board is the state agency (together with the Regional Water Quality Control Boards) charged with implementing water quality certification in California.

Wild and Scenic Rivers Act. The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with significant natural, cultural, and recreational values in a free-flowing condition. The Act safeguards the special character of these rivers, while also recognizing the potential for their appropriate use and development.

Magnuson-Stevens Fishery Conservation and Management Act. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (Public law 94-265; Statutes at Large 90 Stat. 331; 16 U.S.C. ch. 38 § 1801 et seq.) establishes a management system for national marine and estuarine fishery resources. This legislation requires that all federal agencies consult the NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect "essential fish habitat (EFH)." EFH is defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The Magnuson-Stevens Act states that migratory routes to and from anadromous fish spawning grounds are considered EFH.

The phrase "adversely affect" refers to any impact that reduces the quality or quantity of EFH. Federal activities that occur outside of EFH, but which may have an impact on EFH must also be considered. The Act applies to salmon species, groundfish species, highly migratory species such as tuna, and coastal pelagic species such as anchovies.

Executive Order 11988: Floodplain Management. Executive Order 11988 (42 Federal Register 26951, 3 CFR, 1977 Comp., p. 117) requires federal agencies to avoid to the extent possible the long-term and short-term adverse impacts associated with occupying and modifying flood plains and to avoid direct and indirect support of developing floodplains wherever there is a practicable alternative.

1.6.2 State Requirements

California Endangered Species Act. The California Endangered Species Act (CESA) of 1970 (Fish and Game Code Section 2050 et seq., and CCR Title 14, Subsection 670.2, 670.51) prohibits the take of species listed under CESA (14 CCR Subsection 670.2, 670.5). Take is defined as hunt, pursue, catch, capture, or kill or attempt to hunt, pursue, catch, capture, or kill. Under CESA, state agencies are required to consult with the California Department of Fish and Wildlife [CDFW, formerly California Department of Fish and Game (CDFG)] when preparing CEQA documents. Consultation ensures that proposed projects or actions do not have a negative effect on state-listed species. During consultation, CDFW determines whether take would occur and identifies "reasonable and prudent alternatives" for the project and conservation of special-status species. CDFW can authorize take of state-listed species under Sections 2080.1 and 2081(b) of Fish and Game Code in those cases where it is demonstrated that the impacts are minimized and mitigated. Take authorized under section 2081(b) must be minimized and fully mitigated. A CESA permit must be obtained if a project will result in take of listed species, either during construction or over the life of the project. Under CESA, CDFW is responsible for maintaining a list of threatened and endangered species designated under state law (Fish and Game Code 2070). CDFW also maintains lists of species of special concern, which serve as "watch lists." Pursuant to the requirements of CESA, a state or local agency reviewing a proposed project within its jurisdiction must determine whether the proposed project will have a potentially significant impact upon such species. Project-related impacts to species on the CESA list would be considered significant and would require mitigation. Impacts to species of concern or fully protected species would be considered significant under certain circumstances.

California Environmental Quality Act. The California Environmental Quality Act (CEQA) of 1970 (Subsections 21000–21178) requires that CDFW be consulted during the CEQA review process regarding impacts of proposed projects on special-status species. Special-status species are defined under CEQA Guidelines subsection 15380(b) and (d) as those listed under FESA and CESA and species that are not currently protected by statute or regulation but would be considered rare, threatened, or endangered under these criteria or by the scientific community. Therefore, species considered rare or endangered are addressed in this biological resource evaluation

regardless of whether they are afforded protection through any other statute or regulation. The California Native Plant Society (CNPS) inventories the native flora of California and ranks species according to rarity (CNPS 2017). Plants with Rare Plant Ranks 1A, 1B, 2A, or 2B are considered special-status species under CEQA.

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines Section 15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if it can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare and endangered plants and animals. Section 15380(d) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFW (i.e., candidate species) would occur. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agency has an opportunity to designate the species as protected, if warranted.

California Native Plant Protection Act. The California Native Plant Protection Act of 1977 (California Fish and Game Code Section 1900–1913) requires all state agencies to use their authority to carry out programs to conserve endangered and otherwise rare species of native plants. Provisions of the act prohibit the taking of listed plants from the wild and require the project proponent to notify CDFW at least 10 days in advance of any change in land use, which allows CDFW to salvage listed plants that would otherwise be destroyed.

Nesting birds. California Fish and Game Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs. California Fish and Game Code Section 3511 lists birds that are "Fully Protected" as those that may not be taken or possessed except under specific permit.

California Department of Fish and Wildlife Jurisdiction. The CDFW has regulatory jurisdiction over lakes and streams in California. Activities that divert or obstruct the natural flow of a stream; substantially change its bed, channel, or bank; or use any materials (including vegetation) from the streambed, may require that the project applicant enter into a Streambed Alteration Agreement with the CDFW in accordance with California Fish and Game Code Section 1602.

1.0 Methods

2.1 Desktop Review

As a framework for the evaluation and reconnaissance surveys, we obtained an official USFWS species list for the Project (USFWS 2018, Appendix A). In addition, we searched the California Natural Diversity Data Base (CNDDB, CDFW 2018) and the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS 2018) for records of special-status plant and animal species in the Project area (Appendixes B and C). Regional lists of special-status species were compiled using USFWS, CNDDB, and CNPS database searches confined to the Groveland 7.5-minute United States Geological Survey (USGS) topographic quad, which encompasses the Project site, and the eight surrounding quads (Buckhorn Peak, Coulterville, Duckwall Mtn., Jawbone Ridge, Moccasin, Penon Blanco Peak, Standard, and Tuolumne). Local lists of special-status species were compiled using CNDDB records from within 5 miles of the Project site. Species for which the Project site does not provide habitat were eliminated from further consideration. We also reviewed aerial imagery from Google Earth and other sources, USGS topographic maps, and relevant literature.

2.2 Reconnaissance Surveys

Staff Scientists Kristofer Robison and Joe Medley conducted field reconnaissance surveys of the Project site on 4, 5, 10, 11, and 30 April and 14 and 15 May 2018. The Project site and a 50-foot buffer surrounding the Project site were walked and thoroughly inspected to evaluate and document the potential for the site to support federally or state-protected resources. All plants except those under cultivation in agricultural fields or planted in residential areas and all animals (vertebrate wildlife species) observed within the survey area were identified and documented. The survey area was evaluated for the presence of regulated habitats, including lakes, streams, and other waters using methods described in the *Wetlands Delineation Manual* and regional supplement (USACE 1987, 2008).

2.3 Effects Analysis and Significance Criteria

2.3.1 Effects Analysis

Factors considered in evaluating the effects of the Project on special-status species included the (1) presence of designated or proposed critical habitat in the survey area, (2) potential for the survey area to support special-status species, (3) dependence of any such species on specific habitat components that would be removed or modified, (4) the degree of impact to habitat, (5) abundance and distribution of habitat in the region, (6) distribution and population levels of the

species, (7) cumulative effects of the Project and any future activities in the area, and (8) the potential to mitigate any adverse effects.

Factors considered in evaluating the effects of the Project on migratory birds included the potential for the Project to result in (1) mortality of migratory birds or (2) loss of migratory bird nests containing viable eggs or nestlings.

Factors considered in evaluating the effects of the Project on regulated habitats included the (1) presence of features comprising or potentially comprising waters of the United States, Wild and Scenic Rivers, essential fish habitat (EFH), floodplains, and lakes or streams within the survey area, and (2) potential for the Project to impact such habitats.

2.3.2 Significance Criteria

CEQA defines "significant effect on the environment" as "a substantial, or potentially substantial, adverse change in the environment." (Pub. Res. Code, §21068). Under CEQA Guidelines Section 15065, a project's effects on biological resources are deemed significant where the project would do the following:

- Substantially reduce the habitat of a fish or wildlife species
- Cause a fish or wildlife population to drop below self-sustaining levels
- Threaten to eliminate a plant or animal community
- Substantially reduce the number or restrict the range of a rare or endangered plant or animal

In addition to the Section 15065 criteria, Appendix G within the CEQA Guidelines includes six additional impacts to consider when analyzing the effects of a project. Under Appendix G, a project's effects on biological resources are deemed significant where the project would do the following:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS.

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

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

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

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

These criteria were used to determine whether the potential effects of the Project on biological resources qualify as significant.

3.0 Results

3.1 Desktop Review

The official species list for the Project site (USFWS 2018, Table 1, Appendix A) included three species listed as threatened or endangered under the FESA. Those species include the Threatened Delta smelt (*Hypomesus transpacificus*), the Threatened California red-legged frog (*Rana draytonii*), and the Threatened California tiger salamander (*Ambystoma californiense*), none of which is expected to occur on or within 50 feet of the Project site (Table 1). As identified in the official species list (USFWS 2018, Appendix A), the Project site does not occur in designated or proposed critical habitat.

Searching the CNDDB (CDFW 2018) for records of special-status species from within the Groveland 7.5-minute USGS topographic quad and the eight surrounding quads produced 220 records of 50 species (Table 1, Appendix B). Of those species, 26 are known from within 5 miles of the Project site (Table 1, Figure 4). Of those 26, only two special-status species, northwestern pond turtle (*Actinemys marmorata*) and western red bat (*Lasiurus blossevillii*), designated State Species of Special Concern, could occur on or within 50 feet of the Project site based on the presence of suitable conditions. Six other taxa identified in the CNDDB search have the potential to occur on or within 50 feet of the Project site (Table 1). However, as they are not considered special-status species by CDFW or USFWS, they are not discussed further. All other species either do not have a special-status designation or have no potential to occur on or within 50 feet of the Project site (Table 1).

Searching the CNPS rare and endangered plant inventory (CNPS 2018) for records within the Groveland 7.5-minute USGS topographic quad and the eight surrounding quads produced 32 species records (Table 1, Appendix C). Only one species, Small's southern clarkia (*Clarkia australis*), has could occur on or within 50 feet of the Project site. All other species are not expected to occur on or within 50 feet of the Project site (Table 1).

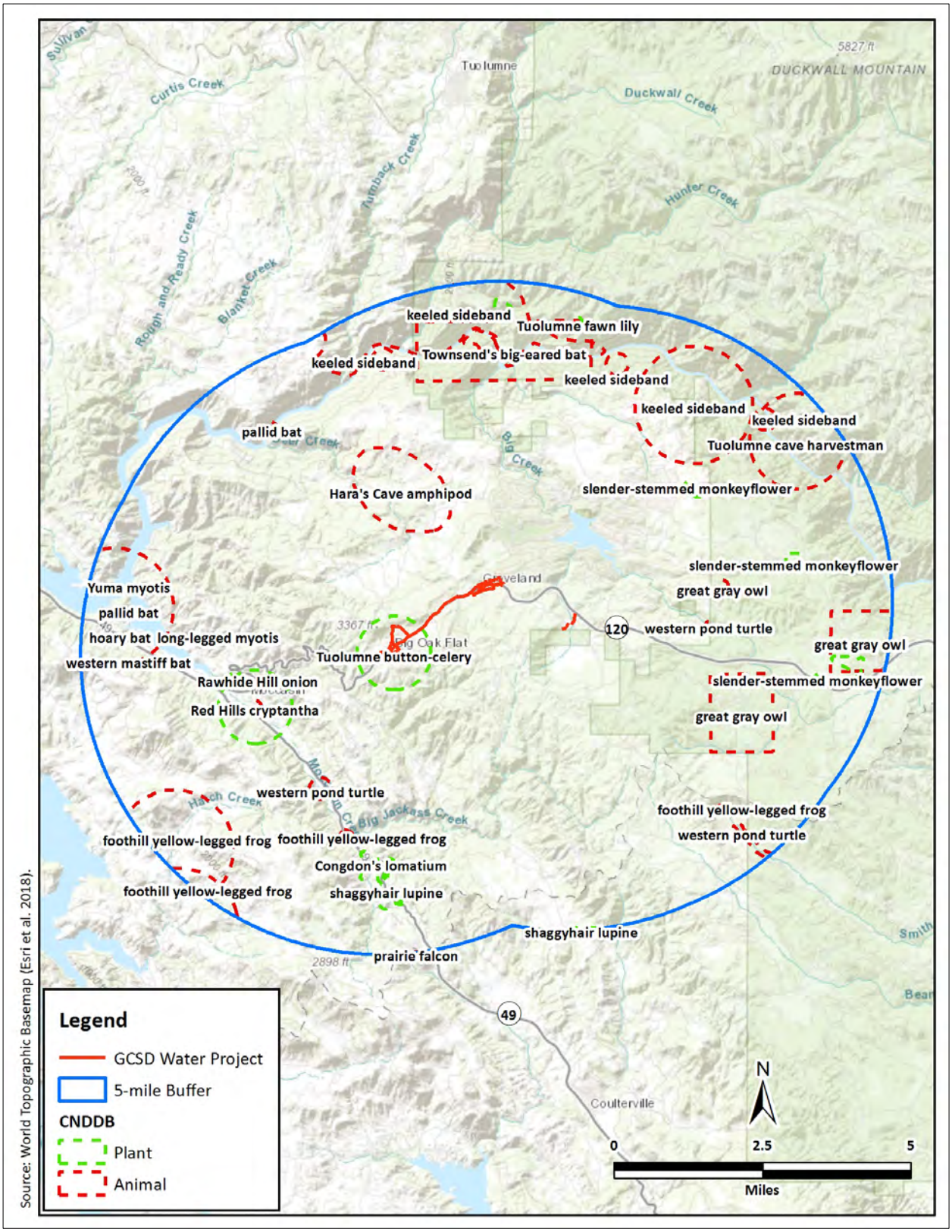

Figure 5. CNDDB occurrence map.

Table 1. Special-status species, their listing status, habitat requirements, and potential to occur on or near the Project site.

Species	Status[1]	Habitat	Potential to Occur[2]
Federally and State-Listed Endangered or Threatened Species			
Hartweg's golden sunburst (*Pseudobahia bahiifolia*)	FE, SE, 1B.1	Cismontane woodland and valley and foothill grassland.	**Absent.** No records from within 5 miles; not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Layne's ragwort (*Packera layneae*)	FT, SR, 1B.1	Chaparral and cismontane woodland, often with serpentine soil.	**Absent.** No records from within 5 miles; not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	Elderberry (*Sambucus* sp.) plants in the Central Valley with stems > 1-inch diameter at ground level.	**Absent.** No records from within 5 miles; outside current known range.
Delta smelt (*Hypomesus transpacificus*)	FT, FE	River channels, tidally influenced sloughs.	**Absent.** Habitat lacking; no connectivity with suitable habitats.
California red-legged frog (*Rana draytonii*)	FT, SSSC	Creeks, ponds, and marshes for breeding; burrows for upland refuge.	**Absent.** Habitat lacking; outside current known range.
California tiger salamander Central California Distinct Population Segment (*Ambystoma californiense*)	FT, ST	Vernal pools or other seasonal sources for breeding; underground refuges for non-breeding.	**Absent.** Habitat lacking; outside current known range; no records from within 5 miles.
Foothill yellow-legged frog (*Rana boylii*)	SCT	Shallow, partly shaded perennial streams and riffles with rocky substrate.	**Absent.** Habitat lacking; no suitable perennial stream within survey area.
Limestone salamander (*Hydromantes brunus*)	ST, FP	Limestone outcrops, caverns, talus, or rock fissures in foothill pine	**Absent.** Habitat lacking; Project site is outside current known range.

Species	Status[1]	Habitat	Potential to Occur[2]
		and chaparral along the Merced River and its tributaries.	
Bald eagle (*Haliaeetus leucocephalus*)	SE, FP	Large, old-growth trees or snags near water.	**Absent.** Habitat lacking; no suitable waterbody within survey area to support this species.
Great gray owl (*Strix nebulosa*)	SE	Meadow edges in mixed conifer forest, red fir forest, or cismontane woodland in Central California.	**Absent.** Habitat lacking no suitable meadow within survey area.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Riparian corridors with a dense, shrubby understory.	**Absent.** Habitat lacking; survey area does not include a dense-shrubby riparian corridor.
Sierra Nevada yellow-legged frog (*Rana sierrae*)	FE, ST	Perennial waters including lakes, ponds, and meadow streams in the Sierra Nevada mountains between 1000 feet and 12,000 feet elevation.	**Absent.** Habitat lacking; no perennial waters within survey area.
Sierra Nevada red fox (*Vulpes vulpes necator*)	FC, ST	High elevation montane woodland and conifer forest.	**Absent.** Habitat lacking; the Project site is in a low elevation cismontane woodland.
State Species of Special Concern			
San Joaquin roach (*Lavinia symmetricus symmetricus*)	SSSC	Tributaries of the San Joaquin River south of and including the Cosumnes River.	**Absent.** Habitat lacking; no connectivity with suitable habitat.
Northwestern pond turtle (*Actinemys marmorata*)	SSSC	Ponds, rivers, marshes, streams, and irrigation ditches, usually with aquatic vegetation. Need basking sites and suitable upland habitat for egg laying.	**Moderate.** Rattlesnake Creek, Garrotte Creek, and an unnamed intermittent waterway are within 50 feet of the Project site and could support this species.
Burrowing owl (*Athene cunicularia*)	SSSC	Grassland and upland scrub with friable soil;	**Absent.** Habitat lacking; the Project site is in a low

Species	Status[1]	Habitat	Potential to Occur[2]
		some agricultural or other developed and disturbed areas with ground squirrel burrows.	elevation cismontane woodland.
Pallid bat (*Antrozous pallidus*)	SSSC	Rock outcrops for roosting in a variety of habitats.	**Absent.** No potential roosting habitat in survey area; any potential for occurrence over the Project site while foraging is negligible since work will occur during the day when this species roosts.
Spotted bat (*Euderma maculatum*)	SSSC	Rock crevices, cliffs, and caves for roosting.	**Absent.** No potential roosting or foraging habitat found; any potential for occurrence over the Project site while foraging is negligible since work will occur during the day when this species roosts.
Townsend's big-eared bat (*Corynorhinus townsendii*)	SSSC	Open buildings, caves, or mines for roosting in a variety of habitats including cismontane woodland and low elevation conifer forest.	**Absent.** No potential roosting habitat in survey area; any potential for occurrence over the Project site while foraging is negligible since work will occur during the day when this species roosts.
Western mastiff bat (*Eumops perotis californicus*)	SSSC	Crevices in cliff faces and rock outcrops for roosting in a variety of habitats including cismontane woodland and low elevation conifer forest.	**Absent.** No potential roosting habitat in survey area; any potential for occurrence over the Project site while foraging is negligible since work will occur during the day when this species roosts.

Species	Status[1]	Habitat	Potential to Occur[2]
Western red bat (*Lasiurus blossevillii*)	SSSC	Trees for roosting from sea level to elevations supporting mixed-conifer forest.	**Moderate.** Suitable roosting trees and foraging areas within 50 feet of the Project site. Any potential for occurrence over the Project site while foraging is negligible, however, since work will occur during the day when this species roosts.
Otherwise Rare or Imperiled Species			
Crotch bumble bee (*Bombus crotchii*)	CNDDB	Various habitats with *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum* as food plants.	**Low.** A couple individual *Eriogonum* plants were found in the survey area.
Hara's cave amphipod (*Stygobromus harai*)	CNDDB	Caves, mine tunnels, and springs in Central California.	**Absent.** Habitat lacking; Project site is outside current know range for this species.
Keeled sideband (*Monadenia circumcarinata*)	CNDDB	Steep limestone outcrops and talus slopes in the Tuolumne River canyon.	**Absent.** Habitat lacking; Project site is outside current know range for this species.
Tuolumne cave harvestman (*Banksula tuolumne*)	CNDDB	Tuolumne Crystal Cave in Tuolumne County.	**Absent.** Habitat lacking; Project site is outside current know range for this species.
Tuolumne sideband (*Monadenia tuolumneana*)	CNDDB	Steep limestone outcrops and talus slopes in the Tuolumne River canyon.	**Absent.** Habitat lacking; Project site is outside current know range for this species.
Wengerors' cave amphipod (*Stygobromus wengerorum*)	CNDDB	Subterranean groundwater habitats and caves in Mariposa County.	**Absent.** Habitat lacking; Project site is outside current know range for this species.
Western pearlshell (*Margaritifera falcate*)	CNDDB	Freshwater rivers, streams, and creeks.	**Low.** Recent flooding likely made conditions

Species	Status[1]	Habitat	Potential to Occur[2]
			unsuitable for this species.
Yosemite Mariposa sideband (*Monadenia yosemitensis*)	CNDDB	Riparian forest of the Merced River and its tributaries.	**Absent.** Habitat lacking; Project site is outside current know range for this species.
Oak titmouse (*Baeolophus inornatus*)	CNDDB	Oak woodland or cismontane woodland.	**Present.** This species was detected in the survey area.
Prairie falcon (*Falco mexicanus*)	WL	Dry, open places with cliffs for nesting.	**Absent.** Habitat lacking; no potential nesting cliffs near the Project site.
Fringed myotis (*Myotis thysanodes*)	CNDDB	Caves, rock outcrops, mines, and buildings for roosting.	**Absent.** No potential roosting habitat within survey area; any potential for occurrence over the Project site while foraging is negligible since work will occur during the day when this species roosts.
Hoary bat (*Lasiurus cinereus*)	CNDDB	Medium to large trees for roosting; open areas for foraging.	**Moderate.** Suitable roosting trees and foraging areas within 50 feet of the Project site; any potential for occurrence over the Project site while foraging, however, is negligible since work will occur during the day when this species roosts.
Long-eared myotis (*Myotis evotis*)	CNDDB	Buildings, rock crevices, snags, and under tree bark in chaparral, cismontane woodland, and conifer forest.	**Moderate.** Suitable roosting trees and foraging areas within 50 feet of the Project site; any potential for occurrence over the Project site while foraging is negligible since work will occur

Species	Status[1]	Habitat	Potential to Occur[2]
			during the day when this species roosts.
Long-legged myotis (Myotis volans)	CNDDB	Conifer forest above 4000 feet elevation.	**Absent.** Habitat lacking; Project site is below known elevation range.
Silver-haired bat (*Lasionycteris noctivagans*)	CNDDB	Tree cavities, snags, exfoliating bark, or abandoned woodpecker holes for roosting.	**Moderate.** Suitable roosting trees and foraging areas within 50 feet of the Project site; any potential for occurrence over the Project site while foraging, however, is negligible since work will occur during the day when this species roosts.
Yuma myotis (*Myotis yumanensis*)	CNDDB	Caves, rock crevices, mines, or buildings for roosting; forages over open water.	**Absent.** No potential roosting or open water foraging habitat in the survey area.
California Rare Plants			
Beaked clarkia (*Clarkia rostrata*)	1B.3	Cismontane woodland and valley and foothill grassland.	**Absent.** Not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Big-scale balsamroot (*Balsamorhiza macrolepis*)	1B.2	Chaparral, cismontane woodland, and valley and foothill grassland.	**Absent.** Not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Brewer's calandrinia (*Calandrinia breweri*)	4.2	Chaparral and coastal scrub.	**Absent.** Habitat lacking; the Project site is in a low elevation cismontane woodland.
Brownish beaked-rush (*Rhynchospora capitellata*)	2B.2	Meadows, seeps, and marshes in conifer forest.	**Absent.** Habitat lacking; the Project site lacks the wetlands features this species requires.

Species	Status[1]	Habitat	Potential to Occur[2]
California beaked-rush (*Rhynchospora californica*)	1B.1	Bogs, fens, meadows, and seeps in conifer forest.	**Absent.** Habitat lacking; the Project site lacks the wetlands features this species requires.
Congdon's lomatium (*Lomatium congdonii*)	1B.2	Chaparral and cismontane woodland with serpentine soil.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Congdon's onion (*Allium sanbornii* var. *congdonii*)	4.3	Serpentine or volcanic soils in chaparral and cismontane woodland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Elongate copper moss (*Mielichhoferia elongata*)	4.3	Usually acidic metamorphic rocky, sometimes carbonate soils near meadows or seeps in conifer forest, cismontane woodland, broadleaf forest, and chaparral.	**Absent.** Habitat lacking; no meadows or seeps in the survey area.
Ewan's larkspur (*Delphinium hansenii* ssp. *ewanianum*)	4.2	Rocky substrates in cismontane woodland and valley and foothill grassland.	**Absent.** Not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Foothill jepsonia (*Jepsonia heterandra*)	4.3	Rocky substrates in cismontane woodland and low elevation conifer forest.	**Absent.** No records from within 5 miles; not detected during reconnaissance surveys, which occurred outside the blooming period of this species.
Fresno ceanothus (*Ceanothus fresnensis*)	4.3	Rocky substrates in cismontane woodland openings and low elevation conifer forest.	**Absent.** No records from within 5 miles; not detected during reconnaissance surveys.
Hall's wyethia (*Wyethia elata*)	4.3	Cismontane woodland and low elevation conifer forest.	**Absent.** Not detected during reconnaissance surveys, which occurred within the blooming period of this species.

Species	Status[1]	Habitat	Potential to Occur[2]
Jepson's onion (*Allium jepsonii*)	1B.2	Serpentine or volcanic soils in chaparral, cismontane woodland, and low elevation conifer forest.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Mariposa clarkia (*Clarkia biloba* ssp. *australis*)	1B.2	Serpentine soils in chaparral and cismontane woodland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Mariposa cryptantha (*Cryptantha mariposae*)	1B.3	Rocky, serpentine soils in chaparral.	**Absent.** Habitat lacking; no serpentine soils known from the survey area, which is a low elevation cismontane woodland.
Parry's horkelia (*Horkelia parryi*)	1B.2	Ione formation and other soils in chaparral and cismontane woodland.	**Absent.** Habitat lacking; no Ione formation soils known from the survey area.
Rawhide Hill onion (*Allium tuolumnense*)	1B.2	Serpentine soils in cismontane woodland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Red Hills cryptantha (*Cryptantha spithamaea*)	1B.3	Serpentine soils in chaparral and cismontane woodland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Red Hills ragwort (*Senecio clevelandii* var. *heterophyllus*)	1B.2	Serpentine seeps in cismontane woodland.	**Absent.** Habitat lacking; no serpentine seeps or soils known from the survey area.
Serpentine bluecup (*Githopsis pulchella* ssp. *serpentinicola*)	4.3	Serpentine or Ione formation soils in cismontane woodland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Shaggyhair lupine (*Lupinus spectabilis*)	1B.2	Serpentine soils in chaparral and cismontane woodland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Sierra clarkia (*Clarkia virgata*)	4.3	Cismontane woodland and low elevation	**Absent.** No records from within 5 miles; not

Species	Status[1]	Habitat	Potential to Occur[2]
		conifer forest between 1300 and 3600 feet elevation.	detected during reconnaissance surveys, which occurred within the blooming period of this species.
Slender-stemmed monkeyflower (*Erythranthe filicaulis*)	1B.2	Meadows and seeps in cismontane woodland and conifer forest.	**Absent.** Habitat lacking; no meadows or seeps in the survey area.
Small-flowered monkeyflower (*Erythranthe inconspicuus*)	4.3	Hillside streams or seeps in chaparral, cismontane woodland, and low elevation conifer forest.	**Absent.** Habitat lacking; no streams or seeps in the survey area.
Small's southern clarkia (*Clarkia australis*)	1B.2	Cismontane woodland and conifer forest between 2600 and 4900 feet elevation.	**Absent.** Not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Stinkbells (*Fritillaria agrestis*)	4.2	Clay and serpentine soils in chaparral, cismontane woodland, pinyon-juniper woodland, and valley and foothill grassland.	**Absent.** Habitat lacking; no serpentine soils known from the survey area.
Tansy-flowered woolly sunflower (*Eriophyllum confertiflorum* var. *tanacetiflorum*)	4.3	Oak woodland below 2600 feet elevation.	**Absent.** Habitat lacking; the Project site is in a low elevation cismontane woodland at 2800 feet elevation.
Tuolumne button-celery (*Eryngium pinnatisectum*)	1B.2	Seasonally flooded depressions in cismontane woodland and low elevation conifer forest.	**Absent.** Habitat lacking; no seasonal wetlands found in the survey area.
Tuolumne fawn lily (*Erythronium tuolumnense*)	1B.2	Open woodland and shady canyons in broadleaf upland forest, chaparral, cismontane woodland, and low elevation conifer forest.	**Absent.** Not detected during reconnaissance surveys, which occurred within the blooming period of this species.
Yellow-lip pansy monkeyflower	1B.2	Vernally wet depressions, disturbed	**Absent.** Not detected during reconnaissance

Species	Status[1]	Habitat	Potential to Occur[2]
(*Diplacus pulchellus*)		areas with clay soil, and meadows and seeps in low elevation conifer forest.	surveys, which occurred within the blooming period of this species.

CDFW (2018), CNPS (2018), USFWS (2018).

Status[1]	Potential to Occur[2]	
CNDDB = Recognized by the CNDDB, other state or federal agencies, or conservation groups as rare or imperiled	Absent:	Neither species nor sign observed; conditions unsuitable for occurrence
FC = Federal Candidate for listing	Low:	Neither species nor sign observed; conditions marginal for occurrence
FE = Federally listed Endangered	Moderate:	Neither species nor sign observed, but conditions suitable for occurrence
FT = Federally listed Threatened	High:	Neither species nor sign observed, but conditions highly suitable for occurrence
FP = Fully Protected	Present:	Species or sign observed
SE = State-listed Endangered		
SR = State-designated Rare		
ST = State-listed Threatened		
SSSC = State Species of Special Concern		
WL = CDFW Watch List		

CNPS California Rare Plant Rank:	Threat Ranks:
1A – plants presumed extirpated in California and either rare or extinct elsewhere.	0.1 – seriously threatened in California (> 80% of occurrences).
1B – plants rare, threatened, or endangered in California and elsewhere.	0.2 – moderately threatened in California (20-80% of occurrences).
4 – plants of limited distribution or infrequently encountered throughout a broad area of California.	0.3 – not very threatened in California (<20% of occurrences).

3.2 Reconnaissance Survey

3.2.1 Land Use and Habitats

The Project site consists of developed and disturbed land cover including roads, residential development, and commercial development. The surrounding land cover is composed of

cismontane woodland. Intermittent and ephemeral waterways are present within 50 feet of each work location.

Figure 6. Photograph of the Big Oak Flat Project location showing existing water main infrastructure in developed and disturbed land cover surrounded by cismontane woodland.

Figure 7. Photograph of the Groveland Project location showing a developed road and an adjacent ephemeral drainage surrounded by cismontane woodland.

Figure 8. Photograph of the White Gulch Project location showing the water main alignment where it crosses under Garrotte Creek, surrounded by cismontane woodland.

3.2.2 Plant and Animal Species Observed

Ninety-four plant species (59 native and 35 nonnative) were found during the survey (Table 2). One amphibian species, 29 bird species, and four mammal species were also detected (Table 2).

Table 2. Plant and animal species observed during the reconnaissance survey.

Common Name	Scientific Name	Regulatory Status
Plants		
Family Adoxaceae		
Blue elderberry	*Sambucus nigra* ssp. *caerulea*	Native
Family Anacardiaceae		
Poison oak	*Toxicodendron diversilobum*	Native
Family Apiaceae		
Common lomatium	*Lomatium utriculatum*	Native
Field hedge parsley	*Torilis arvensis*	Nonnative
Pacific sanicle	*Sanicula crassicaulis*	Native
Poison hemlock	*Conium maculatum*	Nonnative
Family Asteraceae		

Common Name	Scientific Name	Regulatory Status
Bachelor's button	*Centaurea cyanus*	Nonnative
Blow wives	*Achyrachaena mollis*	Native
Common dandelion	*Taraxacum officinale*	Nonnative
Common groundsel	*Senecio vulgaris*	Nonnative
Common yarrow	*Achillea millefolium*	Native
Golden fleece	*Ericameria arborescens*	Native
Gumweed	*Grindelia hirsutula*	Native
Italian thistle	*Carduus pycnocephalus*	Nonnative
Milk thistle	*Silybum marianum*	Nonnative
Mugwort	*Artemisia douglasiana*	Native
Pearly everlasting	*Anaphalis margaritacea*	Native
Prickly sow thistle	*Sonchus asper*	Nonnative
Q-tips	*Micropus californicus*	Native
Rosin weed	*Calycadenia truncate*	Native
Rough cat's ear	*Hypochaeris radicata*	Nonnative
Smooth cat's ear	*Hypochaeris glabra*	Nonnative
Tocalote	*Centaurea melitensis*	Nonnative
Family Berberidaceae		
Oregon grape	*Berberis aquifolium*	Native
Family Betulaceae		
White alder	*Alnus rhombifolia*	Native
Family Boraginaceae		
Canyon nemophila	*Nemophila heterophylla*	Native
Fiddleneck	*Amsinckia sp.*	Native
Grand hound's tongue	*Cynoglossum grande*	Native
Yerba santa	*Eriodictyon californicum*	Native
Family Brassicaceae		
American wintercress	*Barbarea orthoceras*	Native
Fringe pod	*Thysanocarpus curvipes*	Native
Shepherd's purse	*Capsella bursa-pastoris*	Nonnative
Short pod mustard	*Hirschfeldia incana*	Nonnative
Wild radish	*Raphanus sativus*	Nonnative
Family Cupressaceae		
Giant sequoia	*Sequoiadendron giganteum*	Native
Incense cedar	*Calocedrus decurrens*	Native
Family Ericaceae		
White leaf manzanita	*Arctostaphylos manzanita*	Native
Family Fabaceae		
American bird's foot trefoil	*Acmispon americanus*	Native
American vetch	*Vicia Americana*	Native

Common Name	Scientific Name	Regulatory Status
California burclover	*Medicago polymorpha*	Nonnative
Deerweed	*Acmispon glaber*	Native
Miniature lupine	*Lupinus bicolor*	Native
Perennial sweet pea	*Lathyrus latifolius*	Nonnative
Rose clover	*Trifolium hirtum*	Nonnative
Scotch broom	*Cytisus scoparius*	Nonnative
Vetch	*Vicia* sp.	Nonnative
Family Fagaceae		
Black oak	*Quercus kelloggii*	Native
Blue oak	*Quercus douglasii*	Native
Canyon live oak	*Quercus chrysolepis*	Native
Interior live oak	*Quercus wislizeni*	Native
Valley oak	*Quercus lobata*	Native
Family Geraniaceae		
Big heron bill	*Erodium botrys*	Nonnative
Crane's beak geranium	*Geranium molle*	Nonnative
Cutleaf geranium	*Geranium dissectum*	Nonnative
Red stemmed filaree	*Erodium cicutarium*	Nonnative
Family Grossulariaceae		
Sierra gooseberry	*Ribes roezlii*	Native
Family Juncaceae		
Rush	*Juncus* sp.	Native
Family Lamiacieae		
Giraffe head	*Lamium amplexicaule*	Nonnative
White horehound	*Marrubium vulgare*	Nonnative
Family Liliaceae		
Brown bells	*Fritillaria micrantha*	Native
Common soaproot	*Chlorogalum pomeridianum*	Native
Yellow star tulip	*Calochortus monophyllus*	Native
Family Linaceae		
Blue flax	*Linum lewisii*	Native
Family Malvaceae		
Cheeseweed	*Malva parviflora*	Native
Family Montiaceae		
Miner's lettuce	*Claytonia perfoliata*	Native
Narrow-leaved miner's lettuce	*Claytonia parviflora*	Native
Family Onagraceae		
Clarkia	*Clarkia* sp.	Native
Family Orobanchaceae		
Butter 'n' eggs	*Triphysaria eriantha*	Native

Common Name	Scientific Name	Regulatory Status
Family Papaveraceae		
California poppy	*Eschscholzia californica*	Native
Family Pinaceae		
California foothill pine	*Pinus sabiniana*	Native
Ponderosa Pine	*Pinus ponderosa*	Native
Family Plantagninaceae		
English plantain	*Plantago lanceolata*	Nonnative
Speedwell	*Veronica arvensis*	Nonnative
Family Platanaceae		
Western sycamore	*Platanus racemose*	Native
Family Poaceae		
Bulbous blue grass	*Poa bulbosa*	Nonnative
Grass	*Poa sp.*	Nonnative
Johnson grass	*Sorghum halepense*	Nonnative
Ripgut brome	*Bromus diandrus*	Nonnative
Small quaking grass	*Briza minor*	Nonnative
Family Polygonaceae		
Curly dock	*Rumex crispus*	Nonnative
Naked buckwheat	*Eriogonum nudum*	Native
Family Primulaceae		
Shooting star	*Primula hendersonii*	Native
Family Ranunculaceae		
California buttercup	*Ranunculus californicus*	Native
Family Rhamnaceae		
Buck brush	*Ceanothus cuneatus*	Native
Family Rosaceae		
Chamise	*Adenostoma fasciculatum*	Native
Cherry	*Prunus* sp.	Nonnative
Himalayan blackberry	*Rubus armeniacus*	Nonnative
Toyon	*Heteromeles arbutifolia*	Native
Silver weed cinquefoil	*Potentilla anserine*	Native
Wood strawberry	*Fragaria vesca*	Native
Family Rubiaceae		
Climbing bedstraw	*Galium porrigens*	Native
Goose grass	*Galium aparine*	Native
Family Salicaceae		
Sandbar willow	*Salix exigua*	Native
Pacific willow	*Salix lasiandra*	Native
Family Sapindaceae		
California buckeye	*Aesculus californica*	Native

Common Name	Scientific Name	Regulatory Status
Amphibians		
Family Hylidae		
Sierran treefrog	*Pseudacris sierra*	None
Birds		
Family Accipitridae		
Red-shouldered hawk	*Buteo lineatus*	MBTA
Family Aegithalidae		
Bushtit	*Psaltriparus minimus*	MBTA
Family Bombycillidae		
Cedar waxwing	*Bombycilla cedrorum*	MBTA
Family Columbidae		
Band-tailed pigeon	*Patagioenas fasciata*	MBTA
Mourning dove	*Zenaida macroura*	MBTA
Family Corvidae		
California scrub-jay	*Aphelocoma californica*	MBTA
Common raven	*Corvus corax*	MBTA
Steller's jay	*Cyanocitta stelleri*	MBTA
Family Fringillidae		
Lesser goldfinch	*Spinus psaltria*	MBTA
Family Hirundinidae		
Cliff swallow	*Petrochelidon pyrrhonota*	MBTA
Family Icteridae		
Brewer's blackbird	*Euphagus cyanocephalus*	MBTA
Bullock's oriole	*Icterus bullockii*	MBTA
Family Odontophoridae		
California quail	*Callipepla californica*	MBTA
Family Paridae		
Oak titmouse	*Baeolophus inornatus*	MBTA
Family Parulidae		
Yellow-rumped warbler	*Setophaga coronata*	MBTA
Family Passerellidae		
California towhee	*Melozone crissalis*	MBTA
Golden-crowned sparrow	*Zonotrichia atricapilla*	MBTA
Spotted towhee	*Pipilo maculatus*	MBTA
White-crowned sparrow	*Zonotrichia leucophrys*	MBTA
Family Passeridae		
House sparrow	*Passer domesticus*	None
Family Picidae		
Nuttall's woodpecker	*Picoides nuttallii*	MBTA
Family Sittidae		

Common Name	Scientific Name	Regulatory Status
White-breasted nuthatch	*Sitta carolinensis*	MBTA
Family Sturnidae		
European starling	*Sturnus vulgaris*	None
Family Sylviidae		
Wrentit	*Chamaea fasciata*	MBTA
Family Turdidae		
American robin	*Turdus migratorius*	MBTA
Western bluebird	*Sialia mexicana*	MBTA
Family Tyrannidae		
Black phoebe	*Sayornis nigricans*	MBTA
Pacific-slope flycatcher	*Empidonax difficilis*	MBTA
Family Vireonidae		
Hutton's vireo	*Vireo huttoni*	None
Mammals		
Family Cervidae		
California mule deer	*Odocoileus hemionus californicus*	None
Family Geomyidae		
Botta's pocket gopher	*Thomomys bottae*	None
Family Leporidae		
Black-tailed jackrabbit	*Lepus californicus*	None
Family Sciuridae		
California ground squirrel	*Otospermophilis beecheyi*	None

MTBA: Covered under the Migratory Bird Treaty Act.

3.2.3 Nesting Birds and the Migratory Bird Treaty Act

Migratory birds likely nest on or near the Project site. Species that may use the Project site or adjacent areas include, but are not limited to, red-shouldered hawk (*Buteo lineatus*), bushtit (*Psaltriparus minimus*), band-tailed pigeon (*Patagioenas fasciata*), mourning dove (*Zenaida macroura*), California scrub-jay (*Aphelocoma californica*), lesser goldfinch (*Spinus psaltria*), house finch (*Haemorhous mexicanus*), cliff swallow (*Petrochelidon pyrrhonota*), California towhee (*Melozone crissalis*), spotted towhee (*Pipilo maculatus*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), and Hutton's vireo (*Vireo huttoni*).

3.2.4 Regulated Habitats

Multiple Project work locations were within 50 feet of intermittent and ephemeral streams that are hydrologically connected to the Tuolumne River, a navigable waterway under the regulatory jurisdiction of the USACE, the RWQCB, and the CDFW. The Project will likely impact four of these jurisdictional waterways – three in Big Oak Flat, where work could involve trenching across an

ephemeral tributary of Rattlesnake Creek, an intermittent drainage that ultimately drains to the Tuolumne River via Priest Reservoir, or installing concrete pillars on the banks of the high-flow channel of Rattlesnake Creek – and one in Groveland, where concrete pillars could be installed on the severely eroded banks of an unnamed intermittent stream that is tributary to the Tuolumne River above Pine Mountain Lake.

No marine or estuarine fishery resources or migratory routes to and from anadromous fish spawning grounds were present in the survey area; all tributaries to the Tuolumne River, the nearest potential migratory route for anadromous fishes, is effectively blocked by numerous manmade dams. In addition, no EFH, defined by the Magnuson-Stevens Act as those resources necessary for fish spawning, breeding, feeding, or growth to maturity, were present in the survey area. And no federally protected wetlands, such as vernal pools, were found in the survey area.

The Project site is not within a flood plain (Federal Emergency Management Agency 2018). The nearest flood plain limit is at Priest Reservoir, approximately 1.2 miles southwest of the Project site.

4.0 Environmental Impacts

4.1 Effects Determinations

4.1.1 Critical Habitat

We conclude the Project will have **no effect** on critical habitat as no critical habitat has been designated or proposed in the survey area.

4.1.2 Special-Status Species

Northwestern pond turtle, western red bat, and Small's southern clarkia were identified in the desktop review as potentially occurring in the survey area due to the presence of suitable habitat conditions in the survey area (Table 1). Northwestern pond turtle uses aquatic habitats such as creeks, streams, or irrigation ditches for movements and foraging and adjacent upland areas for egg laying; the Project site is adjacent to and crosses multiple drainages that could support this species. Therefore, we conclude the Project **may affect but is not likely to adversely affect** northwestern pond turtle. Western red bat uses trees, tree cavities, and peeling bark for roosting. Because no trees will be removed to facilitate water main installation activities, we conclude the Project will have **no effect** on this species. We also conclude the Project will have **no effec**t on Small's southern clarkia, as the species was not found in the survey area during the flowering period. Additionally, we conclude that the Project will have **no effect** on other special-status species due to the lack of habitat for such species in the survey area.

4.1.3 Migratory Birds

We conclude the Project **may affect but is not likely to adversely affect** nesting migratory birds.

4.1.4 Regulated Habitats

We conclude the Project **may affect, and is likely to adversely affect** four regulated habitats. These habitats consist of intermittent and ephemeral streams under the regulatory jurisdiction of the USACE, the RWQCB, and the CDFW. As such, Clean Water Act Section 404 permits and 401 certifications as well as California Fish and Game Code Section 1602 notifications are being prepared for impacts at these work locations. However, the project will have **no effect** on federally protected wetlands or other regulated habitats under CEQA-Plus purview as no such habitats were found in the survey area.

4.2 Significance Determinations

This Project will not: (1) have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (criterion c) as no federally protected wetlands were found in the survey area; (2) conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (criterion e) as no trees will be removed; or (3) conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan (criterion f) as no such plans exist that pertain to the proposed activities in the Project area. Therefore, these significance criteria are not analyzed further.

The remaining statutorily defined criteria provided the framework for criteria BIO1 through BIO3 below. These criteria are used to assess the impacts to biological resources stemming from the Project and provide the basis for determinations of significance:

- Criterion BIO1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.
- Criterion BIO2: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Criterion BIO3: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS.

4.2.1 Direct and Indirect Impacts

4.2.1.1 Potential Impact #1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS (Criterion BIO1)

The Project could have a substantial, direct adverse effect on northwestern pond turtle, a native reptile designated by the CDFW as a Species of Special Concern. Northwestern pond turtle uses a variety of aquatic habitats including streams, creeks, ponds, lakes, and canals for shelter, foraging, and basking and lays its eggs in uplands adjacent to these aquatic habitats. Because the Project will involve excavation and staging in and adjacent to multiple sections of intermittent and ephemeral streams that could support this species at some time during the year, incidental loss of animals or eggs from adjacent

upland nests could occur. Therefore, we recommend that mitigation measure B1 (below) be included in the conditions of approval to reduce the potential impact to a less-than-significant level.

Mitigation Measure B1. Protect northwestern pond turtle.

1. To the extent practicable, construction in and adjacent to intermittent and ephemeral streams shall be scheduled to occur when streams are dry (approximately mid-July through October) to avoid the possibility of northwestern pond turtle being present at the worksite.

2. If it is not possible to schedule construction between August and October, pre-construction surveys for northwestern pond turtle shall be conducted by a qualified biologist to determine if turtles are occupying stream-adjacent worksites. A pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all sections of stream within 300 feet of planned work activities, including adjacent upland areas, for turtles and nests; northwestern pond turtle nests in upland areas within several hundred feet of water in the spring, typically during the months of April and May. If a turtle or nest is found within 300 feet of the worksite, a qualified biological monitor shall remain on site during construction to ensure that no turtles or turtle nests are impacted by work activities. Any turtle found on or adjacent to the worksite shall be allowed to leave on its own.

4.2.1.2 Potential Impact #2: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (Criterion BIO2)

The Project has the potential to impede the use of nursery sites for native birds protected under the Migratory Bird Treaty Act and California Fish and Game Code.

Migratory birds are expected to nest on and near the Project site. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment or loss of reproductive effort is considered take by the CDFW. Loss of fertile eggs or nesting birds, or any activities resulting in nest abandonment, could constitute a significant impact if the species is particularly rare in the region. Construction activities such as excavation, trenching, water main or water valve installation, and mobilizing or demobilizing construction equipment that disturb a nesting bird on the site or immediately adjacent to the construction zone could constitute a significant impact.

We recommend that the mitigation measure B2 (below) be included in the conditions of approval to reduce the potential impact to a less-than-significant level.

Mitigation Measure B2. Protect nesting birds.

1. To the extent practicable, construction shall be scheduled to avoid the nesting season, which extends from February through August.

2. If it is not possible to schedule construction between September and January, pre-construction surveys for nesting birds shall be conducted by a qualified biologist to ensure that no active nests will be disturbed during Project implementation. A pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all potential nest substrates in and immediately adjacent to the impact areas for nests. If an active nest is found close enough to the construction area to be disturbed by these activities, the qualified biologist shall determine the extent of a construction-free buffer to be established around the nest. If work cannot proceed without disturbing the nesting birds, work may need to be halted or redirected to other areas until nesting and fledging are completed or the nest has failed for non-construction related reasons.

4.2.1.3 Potential Impact #3: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS (Criterion BIO3)

The Project will impact one ephemeral drainage in Big Oak Flat that supports Himalayan blackberry (*Rubus armeniacus*), a nonnative vine that forms dense thickets in numerous settings, including riparian areas. Work activities will involve excavating an open trench across the drainage to replace the existing water main, and currently, Himalayan blackberry is growing on both banks and partly in the bed of the drainage. Although nonnative and highly invasive, Himalayan blackberry can serve as a surrogate to native riparian vegetation. Based on the abundance of this plant species in the local area, however, including on and adjacent to the impact area, recolonization after Project completion is expected to occur naturally and probably within one growing season. Therefore, we conclude that Project-related impacts to riparian habitat will be negligible, don't meet the threshold of significance, and consequently require no mitigation.

4.2.2 Cumulative Impacts

Mitigation Measures B1 and B2 would reduce any contribution to cumulative impacts on biological resources to a less-than-significant level.

4.2.3 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse impacts on biological resources would occur from implementing the Project.

5.0 Literature Cited

California Department of Fish and Wildlife (CDFW). 2018. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Biogeographic data branch, California Natural Diversity Data Base. https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data, accessed 06 April 2018.

California Native Plant Society, Rare Plant Program (CNPS). 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). http://www.rareplants.cnps.org. Accessed 06 April 2018.

Federal Emergency Management Agency. 2017. Map Number FM06047C0200G, Merced County, California. National Flood Insurance Program. Map revised December 2, 2008. https://msc.fema.gov/portal/. Accessed 18 April 2018.

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United States Fish and Wildlife Service. 2018. IPaC Information for Planning and Conservation. https://ecos.fws.gov/ipac/. Accessed 06 April 2018.

Appendix A. Official lists of threatened and endangered species and critical habitats.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: April 06, 2018
Consultation Code: 08ESMF00-2018-SLI-1777
Event Code: 08ESMF00-2018-E-05158
Project Name: Groveland Community Services District Clearwells Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2018-SLI-1777

Event Code: 08ESMF00-2018-E-05158

Project Name: Groveland Community Services District Clearwells Project

Project Type: WATER QUALITY MODIFICATION

Project Description: Rehabilitation of two clearwell water tanks and their associated chlorine injection tanks.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.82749607200006N120.14659152349464W

Counties: Tuolumne, CA

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. 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.

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2891

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/321

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix B. CNDDB occurrence records.

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Standard (3712083) OR Tuolumne (3712082) OR Duckwall Mtn. (3712081) OR Moccasin (3712073) OR Groveland (3712072) OR Jawbone Ridge (3712071) OR Penon Blanco Peak (3712063) OR Coulterville (3712062) OR Buckhorn Peak (3712061))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Allium tuolumnense Rawhide Hill onion	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	700 1,250	23 S:2	0	1	1	0	0	0	2	0	2	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	810 2,750	411 S:5	0	0	0	0	0	5	1	4	5	0	0
Athene cunicularia burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,700 1,700	1967 S:1	0	0	0	1	0	0	0	1	1	0	0
Baeolophus inornatus oak titmouse	G4 S4	None None	IUCN_LC-Least Concern NABCI_YWL-Yellow Watch List USFWS_BCC-Birds of Conservation Concern	980 980	2 S:1	0	1	0	0	0	0	0	1	1	0	0
Balsamorhiza macrolepis big-scale balsamroot	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,300 2,900	50 S:4	0	0	0	0	0	4	1	3	4	0	0
Banksula tuolumne Tuolumne cave harvestman	G1 S1	None None		3,100 3,100	1 S:1	0	0	0	0	0	1	1	0	1	0	0
Bombus crotchii Crotch bumble bee	G3G4 S1S2	None None		3,000 3,000	234 S:1	0	0	0	0	0	1	1	0	1	0	0
Clarkia australis Small's southern clarkia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	3,000 5,000	59 S:9	0	1	2	0	0	6	4	5	9	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Clarkia biloba ssp. australis Mariposa clarkia	G4G5T2T3 S2S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden USFS_S-Sensitive	800 4,850	83 S:44	1	6	2	0	0	35	3	41	44	0	0
Clarkia rostrata beaked clarkia	G2G3 S2S3	None None	Rare Plant Rank - 1B.3 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden	900 2,000	74 S:11	0	1	0	0	0	10	1	10	11	0	0
Corynorhinus townsendii Townsend's big-eared bat	G3G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	1,380 3,720	626 S:6	0	0	0	0	0	6	4	2	6	0	0
Cryptantha mariposae Mariposa cryptantha	G2G3 S2S3	None None	Rare Plant Rank - 1B.3 BLM_S-Sensitive	1,500 1,500	9 S:1	0	0	0	0	0	1	1	0	1	0	0
Cryptantha spithamaea Red Hills cryptantha	G2 S2	None None	Rare Plant Rank - 1B.3	1,750 1,750	6 S:2	0	0	0	0	0	2	2	0	2	0	0
Desmocerus californicus dimorphus valley elderberry longhorn beetle	G3T2 S2	Threatened None		1,650 2,850	271 S:3	0	2	1	0	0	0	0	3	3	0	0
Diplacus pulchellus yellow-lip pansy monkeyflower	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,200 4,000	69 S:8	0	1	1	0	0	6	4	4	8	0	0
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	1,060 3,000	1340 S:4	0	1	0	0	0	3	3	1	4	0	0
Eryngium pinnatisectum Tuolumne button-celery	G2 S2	None None	Rare Plant Rank - 1B.2	2,400 3,000	24 S:3	0	0	0	0	0	3	2	1	3	0	0
Erythranthe filicaulis slender-stemmed monkeyflower	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,045 3,250	49 S:10	1	3	1	0	0	5	9	1	10	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Erythronium tuolumnense Tuolumne fawn lily	G2G3 S2S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden USFS_S-Sensitive	1,600 3,200	35 S:10	2	2	0	0	0	6	7	3	10	0	0
Euderma maculatum spotted bat	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	2,700 2,700	68 S:1	0	0	0	0	0	1	1	0	1	0	0
Eumops perotis californicus western mastiff bat	G5T4 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern WBWG_H-High Priority	850 1,550	294 S:4	0	0	0	0	0	4	1	3	4	0	0
Falco mexicanus prairie falcon	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,100 1,100	459 S:1	0	0	0	0	0	1	1	0	1	0	0
Fritillaria agrestis stinkbells	G3 S3	None None	Rare Plant Rank - 4.2	940 3,000	32 S:2	0	0	0	0	0	2	2	0	2	0	0
Haliaeetus leucocephalus bald eagle	G5 S3	Delisted Endangered	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	700 700	327 S:1	1	0	0	0	0	0	0	1	1	0	0
Horkelia parryi Parry's horkelia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	1,500 3,300	44 S:4	0	1	0	0	0	3	3	1	4	0	0
Hydromantes brunus limestone salamander	G2G3 S2S3	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_VU-Vulnerable USFS_S-Sensitive	1,180 3,275	21 S:6	0	0	0	0	0	6	3	3	6	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Lasionycteris noctivagans silver-haired bat	G5 S3S4	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	1,550 1,550	139 S:2	0	0	0	0	0	2	0	2	2	0	0
Lasiurus blossevillii western red bat	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	850 3,450	126 S:2	0	0	0	0	0	2	1	1	2	0	0
Lasiurus cinereus hoary bat	G5 S4	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	850 3,450	236 S:6	0	0	0	0	0	6	2	4	6	0	0
Lavinia symmetricus ssp. 1 San Joaquin roach	G4T3Q S3	None None	CDFW_SSC-Species of Special Concern	900 2,750	8 S:5	0	2	2	1	0	0	0	5	5	0	0
Lomatium congdonii Congdon's lomatium	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	1,500 1,600	20 S:2	0	1	0	0	0	1	0	2	2	0	0
Lupinus spectabilis shaggyhair lupine	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	1,425 2,500	24 S:16	1	8	2	0	1	4	9	7	15	1	0
Margaritifera falcata western pearlshell	G4G5 S1S2	None None		2,800 2,850	78 S:3	0	0	0	0	0	3	0	3	3	0	0
Monadenia circumcarinata keeled sideband	G1 S1	None None	BLM_S-Sensitive IUCN_VU-Vulnerable	1,500 2,500	6 S:6	0	0	0	0	0	6	5	1	6	0	0
Monadenia tuolumneana Tuolumne sideband	G1 S1	None None	BLM_S-Sensitive	1,650 2,300	2 S:2	0	0	0	0	0	2	1	1	2	0	0
Monadenia yosemitensis Yosemite Mariposa sideband	G1 S1S2	None None		1,390 1,390	7 S:1	0	0	0	0	0	1	0	1	1	0	0
Myotis evotis long-eared myotis	G5 S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_M-Medium Priority	3,720 3,720	139 S:1	0	0	0	0	0	1	0	1	1	0	0

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Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Myotis thysanodes fringed myotis	G4 S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	1,550 3,720	86 S:2	0	0	0	0	0	2	0	2	2	0	0
Myotis volans long-legged myotis	G5 S3	None None	IUCN_LC-Least Concern WBWG_H-High Priority		117 S:2	0	0	0	0	0	2	0	2	2	0	0
Myotis yumanensis Yuma myotis	G5 S4	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_LM-Low-Medium Priority	850 2,750	263 S:4	0	0	0	0	0	4	0	4	4	0	0
Packera layneae Layne's ragwort	G2 S2	Threatened Rare	Rare Plant Rank - 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	1,650 1,650	52 S:1	0	1	0	0	0	0	0	1	1	0	0
Rana boylii foothill yellow-legged frog	G3 S3	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	1,200 3,800	1693 S:7	0	1	0	0	0	6	6	1	7	0	0
Rana sierrae Sierra Nevada yellow-legged frog	G1 S1	Endangered Threatened	CDFW_WL-Watch List IUCN_EN-Endangered USFS_S-Sensitive	2,500 2,500	663 S:1	0	0	0	0	0	1	1	0	1	0	0
Rhynchospora capitellata brownish beaked-rush	G5 S1	None None	Rare Plant Rank - 2B.2	3,010 3,010	19 S:1	1	0	0	0	0	0	1	0	1	0	0
Senecio clevelandii var. heterophyllus Red Hills ragwort	G4?T2Q S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	1,200 1,200	9 S:1	0	1	0	0	0	0	0	1	1	0	0
Strix nebulosa great gray owl	G5 S1	None Endangered	CDF_S-Sensitive IUCN_LC-Least Concern USFS_S-Sensitive	2,825 3,200	79 S:4	0	0	1	0	0	3	4	0	4	0	0
Stygobromus harai Hara's Cave amphipod	G1G2 S1S2	None None	IUCN_VU-Vulnerable	2,350 2,350	3 S:1	0	0	0	0	0	1	1	0	1	0	0
Stygobromus wengerorum Wengerors' Cave amphipod	G1 S1	None None	IUCN_VU-Vulnerable	2,400 2,900	2 S:2	0	0	0	0	0	2	2	0	2	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Vireo bellii pusillus least Bell's vireo	G5T2 S2	Endangered Endangered	IUCN_NT-Near Threatened NABCI_YWL-Yellow Watch List	840 840	482 S:1	0	0	0	0	1	0	1	0	0	0	1
Vulpes vulpes necator Sierra Nevada red fox	G5T1T2 S1	Candidate Threatened	USFS_S-Sensitive	3,000 3,400	201 S:2	0	0	0	0	0	2	2	0	2	0	0

Appendix C. CNPS plant list.

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

32 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712083, 3712082, 3712081, 3712073, 3712072, 3712071, 3712063 3712062 and 3712061;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Allium jepsonii	Jepson's onion	Alliaceae	perennial bulbiferous herb	Apr-Aug	1B.2	S2	G2
Allium sanbornii var. congdonii	Congdon's onion	Alliaceae	perennial bulbiferous herb	Apr-Jul	4.3	S3	G4T3
Allium tuolumnense	Rawhide Hill onion	Alliaceae	perennial bulbiferous herb	Mar-May	1B.2	S2	G2
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Calandrinia breweri	Brewer's calandrinia	Montiaceae	annual herb	(Jan)Mar-Jun	4.2	S4	G4
Ceanothus fresnensis	Fresno ceanothus	Rhamnaceae	perennial evergreen shrub	May-Jul	4.3	S4	G4
Clarkia australis	Small's southern clarkia	Onagraceae	annual herb	May-Aug	1B.2	S2	G2
Clarkia biloba ssp. australis	Mariposa clarkia	Onagraceae	annual herb	Apr-Jul	1B.2	S2S3	G4G5T2T3
Clarkia rostrata	beaked clarkia	Onagraceae	annual herb	Apr-May	1B.3	S2S3	G2G3
Clarkia virgata	Sierra clarkia	Onagraceae	annual herb	May-Aug	4.3	S3	G3
Cryptantha mariposae	Mariposa cryptantha	Boraginaceae	annual herb	Apr-Jun	1B.3	S2S3	G2G3
Cryptantha spithamaea	Red Hills cryptantha	Boraginaceae	annual herb	Apr-May	1B.3	S2	G2
Delphinium hansenii ssp. ewanianum	Ewan's larkspur	Ranunculaceae	perennial herb	Mar-May	4.2	S3	G4T3
Diplacus pulchellus	yellow-lip pansy monkeyflower	Phrymaceae	annual herb	Apr-Jul	1B.2	S2	G2
Eriophyllum confertiflorum var. tanacetiflorum	tansy-flowered woolly sunflower	Asteraceae	perennial shrub	May-Jul	4.3	S2?	G5T2?Q
Eryngium pinnatisectum	Tuolumne button-celery	Apiaceae	annual / perennial herb	May-Aug	1B.2	S2	G2
Erythranthe filicaulis	slender-stemmed monkeyflower	Phrymaceae	annual herb	Apr-Aug	1B.2	S2	G2
Erythranthe inconspicua	small-flowered monkeyflower	Phrymaceae	annual herb	May-Jun	4.3	S4	G4
Erythronium tuolumnense	Tuolumne fawn lily	Liliaceae	perennial bulbiferous	Mar-Jun	1B.2	S2S3	G2G3

			herb				
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	4.2	S3	G3
Githopsis pulchella ssp. serpentinicola	serpentine bluecup	Campanulaceae	annual herb	May-Jun	4.3	S3	G4T3
Horkelia parryi	Parry's horkelia	Rosaceae	perennial herb	Apr-Sep	1B.2	S2	G2
Jepsonia heterandra	foothill jepsonia	Saxifragaceae	perennial herb	Aug-Dec	4.3	S3	G3
Lomatium congdonii	Congdon's lomatium	Apiaceae	perennial herb	Mar-Jun	1B.2	S2	G2
Lupinus spectabilis	shaggyhair lupine	Fabaceae	annual herb	Apr-May	1B.2	S2	G2
Mielichhoferia elongata	elongate copper moss	Mielichhoferiaceae	moss		4.3	S4	G5
Packera layneae	Layne's ragwort	Asteraceae	perennial herb	Apr-Aug	1B.2	S2	G2
Pseudobahia bahiifolia	Hartweg's golden sunburst	Asteraceae	annual herb	Mar-Apr	1B.1	S2	G2
Rhynchospora californica	California beaked-rush	Cyperaceae	perennial rhizomatous herb	May-Jul	1B.1	S1	G1
Rhynchospora capitellata	brownish beaked-rush	Cyperaceae	perennial herb	Jul-Aug	2B.2	S1	G5
Senecio clevelandii var. heterophyllus	Red Hills ragwort	Asteraceae	perennial herb	May-Jul	1B.2	S2	G4?T2Q
Wyethia elata	Hall's wyethia	Asteraceae	perennial herb	May-Aug	4.3	S4	G4

Suggested Citation

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 18 April 2018].

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The California Lichen Society
California Natural Diversity Database
The Jepson Flora Project
The Consortium of California Herbaria
CalPhotos

Questions and Comments
rareplants@cnps.org

Appendix C

Cultural Resources Report

Appendix D

Preliminary Engineering Report

GROVELAND COMMUNITY SERVICES DISTRICT

Water Distribution System Improvements

ENGINEERING DESIGN REPORT

May 2017

Prepared by:

Consulting Engineers

5150 N Sixth St, Suite 124

Fresno CA 93710

TABLE OF CONTENTS

APPENDIX D 2013 CALIFORNIA FIRE CODE

List of Tables

List of Figures

ABBREVIATIONS

AWS	Alternative Water Source
AWWA	American Water Works Association
CDP	Census Designated Place
CEQA	California Environmental Quality Act
CFS	Cubic Feet per Second
CSD	Community Services District
CT	Contact Time
DAC	Disadvantaged Community
DBPR	Disinfection Byproducts Rules
District	Groveland Community Services District
GCSD	Groveland Community Services District
GPH	Gallons per Hour
GPM	Gallons per Minute
HP	Horsepower
LF	Linear Feet
MG	Million Gallons
MG/L	Milligram per Liter
MHI	Median Household Income
NEPA	National Environmental Policy Act
PLC	Programmable Logic Controller
PRV	Pressure Reducing Valve
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
ROW	Right-of-Way
SCADA	Supervisory Control and Data Acquisition
SDAC	Severely Disadvantaged Community
SWRCB	State Water Resources Control Board
UV	Ultraviolet Light
VFD	Variable Frequency Drive

SECTION 1 - INTRODUCTION

1.1. Purpose of this Preliminary Engineering Report

The purpose of this Engineering Report (Report) is to provide a comprehensive evaluation of the existing condition of the Groveland Community Services District (District) Water Distribution System within the Groveland and Pine Oak Flat areas, and to identify improvements necessary to provide adequate water service.

The preparation of this Engineering Report is being funded by the State Water Resources Control Board (SWRCB) through a Planning Grant. The contents of this report are intended to satisfy the plan of study prepared for that grant.

1.2. Background

The Groveland CSD is located on the western slope of the Sierra Nevada Mountains due east from San Francisco. GCSD is in Tuolumne County, 30 miles south of Sonora and 26 miles from the west entrance to Yosemite National Park. GCSD provides water service to the communities of Groveland, Big Oak Flat and Pine Mountain Lake. In the 2010 Census, the communities of Groveland and Big Oak Flat were combined into a Census Designated Place (CDP) and the community of Pine Mountain Lake was a separate CDP. Table 2-1 provides the 2010 US Census Population and the 2010-2014 Median Household Income by the most recent American community survey.

Table 1-1 Median Household Income

CDP	Population	MHI
Groveland-Big Oak Flat	601	$31,932
Pine Mountain Lake	2,796	$51,604
Total	3,397	$48,124*
*: Weighted Average		

According to the MHI in Table 1-1, Groveland and Big Oak Flat are Severely Disadvantaged Communities (SDACs). The weighted average of the MHI also classifies the entire GCSD area as a DAC. The current monthly residential water rate consists of a fixed service charge dependent on the size of connection, bond/debt charges, and an addition usage charge (see water and sewer rate schedule in Appendix A) The rate schedule details the volume usage charge, which is determined based on metered water use. The minimum monthly rate is $50.64 which is slightly less than 1.5% of the MHI ($56.14), an affordability indicator used by most state and federal funding agencies. There are no additional water costs such as assessments.

The District provides water service to approximately 3,123 connections including residents and businesses. The District's water distribution system consists of laterals and approximately 70 miles of water mains. The water distribution system is divided into 11 pressure zones divided by location and elevation. The water system receives routine maintenance by District Staff. A detailed description of the District's water system is included in the following section.

SECTION 2 - PROJECT PLANNING AREA

2.1. Location

The Groveland Community Service District is a special District formed by the State of California, spanning approximately 15 square miles in southern Tuolumne County, located in the Central Sierra Nevada Mountains. The District is bounded on the north by the Tuolumne River, on the south by Mariposa County, on the east by Stanislaus National Forest, and on the west by Moccasin. The District consists of three areas of concentrated population: Groveland, Big Oak Flat, and Pine Mountain Lakes. This report is limited to planned improvements to the water distribution system within the Groveland and Big Oak Flat areas, with some additional improvements located near White Gulch Rd. to the southeast of Groveland.

2.2. Environmental Resources

This water system improvements project includes primarily the replacement and rehabilitation of public water mains in existing public rights-of-way (ROW). Biological and cultural resources will be conducted for the project area in accordance with CEQA/NEPA requirements. It is not anticipated that impacts to wetlands, floodplains, farmland, historic resources, or endangered species will be part of the project. Some disturbance to trees and roots may take place. A Notice of Exemption will be prepared and filed for this project.

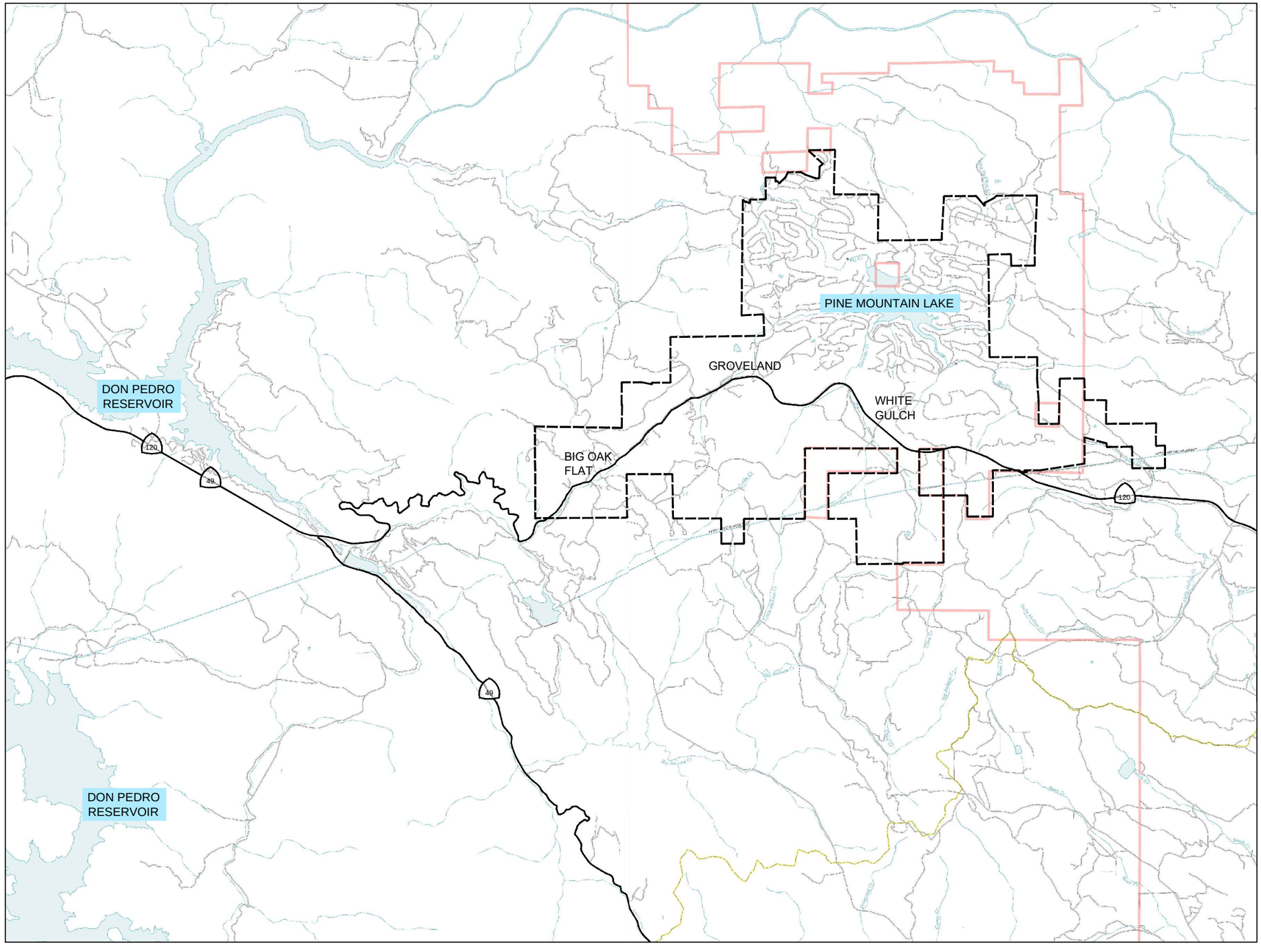
2.3. Growth Areas and Population

Figure 2-1 shows the current District Service Area. The district covers approximately 15 square miles, some of which is undeveloped and not served by the water distribution system. The distribution system within Groveland and Big Oak Flat covers a much smaller area. The total population of the district is 3,414. The population within the project area is 601. The water system has a total of 3,123 connections. Approximately 2.7% of the connections are classified as commercial/industrial. The remaining connections are classified as single family residential. According to the 2010 Census, there are 277 households within the Groveland and Big Oak Flat area, not including Pine Mountain Lake.

The District boundaries are unlikely to expand in the near future, as most growth is expected to take place within the undeveloped areas of Pine Mountain Lake. Historical data indicates a projected population growth rate of 0.25% Little growth is anticipated for the areas of Groveland and Big Oak Flat. Future growth within the Pine Mountain Lake area is not expected to have a significant effect on the distribution system within Big Oak Flat and Groveland.

GROVELAND COMMUNITY SERVICES DISTRICT

WATER DISTRIBUTION SYSTEM IMPROVEMENT PROJECT



Groveland Community Services District

GCSD SERVICE AREA BOUNDARY

NORTH

0 6000' 12000'

SCALE: 1" = 6000'

FIGURE 2-1
GROVELAND CSD
SERVICE AREA MAP

SECTION 3 - EXISTING FACILITIES AND PROJECT NEED

3.1. Overview

The District owns and operates a water system serving the communities of Groveland, Big Oak Flat, and Pine Mountain Lake. The District's current Water Master Plan was adopted in 2001, outlining anticipated improvements to the District's water infrastructure to improve fire flows and accommodate expected demand growth. The Plan focuses on infrastructure needs throughout the District's service area, including the buildout of the Pine Mountain Lake water distribution system.

The District's water system consists of two supply pumps with treatment facilities and clearwell storage, 5 storage tanks, 11 pressure zones, 17 pressure reducing valves (PRVs), 3 intra-system booster pumps, approximately 425 fire hydrants and approximately 70 miles of water mains. This report only addresses portions of the water system that serve the communities of Groveland and Big Oak Flat, as well as the nearby White Gulch area. Within this area, the distribution system includes approximately 35,000 feet of water mains. Figure 3-1 shows a map of the existing water distribution system infrastructure in Big Oak Flat. Figure 3-2 shows a map of the existing water distribution system infrastructure in Groveland, while Figure 3-3 shows a map of the existing water distribution system in the nearby White Gulch area.

3.2. History

Groveland and Big Oak Flat were established as mining camps in 1852, where they thrived during the California Gold Rush. After the decline in gold production, the communities continued to serve travelers visiting nearby Yosemite National Park. The lakeside community of Pine Mountain Lake was developed during the late 1960s. This community is now included in the GCSD service area. Pine Mountain Lake consists of approximately 3000 housing units, many of which serve as vacation homes during the warmer months.

3.3. Water Supply

GCSD provides water under Domestic Water Supply Permit No. 03-11-13P-008. GCSD obtains most of its water supply from the Mountain Tunnel which is part of the Hetch Hetchy Aqueduct system. The Hetch Hetchy Aqueduct source is approved for filtration avoidance. The Mountain Tunnel is 19 miles long and has a capacity of 660 cfs. GCSD pumps water from two vertical shafts tapped into the Mountain Tunnel designated as the Big Creek Station and the Second Garrotte Station. Each pumping station lift water from the Mountain Tunnel into a 2 MG clearwell. The pump stations are typically operated for approximately four to six hours in the morning (every day in the summer and every other day in the winter) to meet peak morning demands and to fill the reservoirs for the remainder of the day.

The Big Creek Station supplies approximately 80% of the water used by the District. Water is pumped from the tunnel that is located approximately 570 feet below the pump station. The pump consists of a 400 HP oil lubricated, variable frequency drive (VFD), 9 stage vertical turbine pump. The pump is capable of delivering approximately 1,300 to 1,400 gpm to the distribution system. The pump is located in a locked shed that is within a fenced area. The pump discharge flow is split between two flow meters and then combines again prior to chemical injection. The treatment provided is disinfection and pH adjustment.

Consulting Engineers

Legend

Existing Water Main

0 175 350 FT

PROJECT

GROVELAND COMMUNITY SERVICES DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS

BIG OAK FLAT WATER SYSTEM INFRASTRUCTURE

FIGURE 3-1

Consulting Engineers

Legend

Existing Water Main

0 150 300 FT

PROJECT

GROVELAND COMMUNITY SERVICES DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS

GROVELAND WATER SYSTEM INFRASTRUCTURE

FIGURE 3-2

Consulting Engineers

Legend

Existing Water Main

0 175 350 FT

PROJECT

GROVELAND COMMUNITY SERVICES DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS

WHITE GULCH WATER SYSTEM INFRASTRUCTURE

FIGURE 3-3

The Second Garrotte Station is located approximately three miles downstream of the Big Creek Station and pumps water from the Mountain Tunnel 720 feet below. The pump consists of a 200 HP electric motor and an oil lubricated 16 stage vertical turbine pump. The discharge line includes a 100 HP Aurora centrifugal pump to help boost water to the distribution system and to Tank No. 3. Each pump has an approximate capacity of 700 gpm, and both pumps are located within a fenced area secured by a lock. In similar fashion to the Big Creek Pump Station, the pump discharge is separated into two pipelines each equipped with a flow meter. After the flow meters, the discharge line manifolds back into a single pipe where disinfection and pH adjustment chemicals are then injected.

GCSD's third water supply source is Pine Mountain Lake. This Alternative Water Supply Source (AWS) is only used during periods when the Mountain Tunnel is out of service for maintenance. This AWS is based on an agreement that was reached between the San Francisco Public Utilities Commission, Modesto Irrigation District, Turlock Irrigation District and the District, on July 30, 2007. The agreement allows for withdrawal of up to 200 acre-feet from the lake. Any water that GCSD withdraws from Pine Mountain Lake is deducted from the San Francisco Public Utilities Commission's Don Pedro Reservoir water bank account.

3.4. Water Treatment

GCSD has relied on filtration avoidance to achieve compliance with the SWTR using the disinfection process only. However, since the adoption of the Federal Disinfection Byproducts Rule (DBPR) on January 1, 2004, GCSD modifies the disinfection process to achieve compliance with the DBPR and maintain filtration avoidance.

GCSD provides prechlorination with free chlorine in a 16,900 gallon chlorine contact tank, followed by chloramination in the existing 2.0 MG clearwell, and then UV disinfection at each plant. The purpose of chloramination is to reduce the DBP levels in the distribution system and the UV disinfection is to inactivate Giardia and Cryptosporidium. The free chlorination provides at least 4.0 logs of virus inactivation and the UV disinfection provides at least 3.0 logs of Giardia and Cryptosporidium inactivation.

GCSD uses on-site chlorine generators at both of their plants. The raw water is fed a chlorine solution to provide an initial concentration of 2.85 to 3.0 mg/L of free chlorine into the chlorine contact tank. A chlorine analyzer records the residual going into the tank. When the water leaves the chlorine contact tank, the residual is monitored again and the concentration is approximately 2.75 mg/L. Prior to the chlorinated water entering the 2.0 MG clearwells, it is injected with ammonia to react with the chlorine to form chloramines. Each clearwell contains 5 hypalon curtains to reduce the potential for short circuiting.

Following the 2 MG clearwell and before water is pumped into the distribution system, GCSD provides UV disinfection. UV disinfection equipment consists of a Calgon Carbon Corporation Sentinel UV disinfection system. The Sentinel UV disinfection system installed at the Big Creek and Second Garrotte treatment plants each have two treatment trains, where each reactor (one treatment train) has three banks of two UV lamps.

GCSD uses standard hydrated lime to increase the natural pH of the water to about 9.8. The lime is food grade and certified to meet ANSI/NSF standard 60 requirements for additives. The lime feed system is

contained in a separate smaller room, as well as the electrical control panels and some of the SCADA system. All chemical feed pumps used at the treatment plant are Fluid Control ProMinent Sigma series which are able to deliver a maximum capacity of 28.5 gallons per hour (gph) at 145 psi. The chemical feed rates are manually adjusted, but they can also be looped to the ATI chlorine analyzers/controllers and flow pacing equipment that will automatically adjust the pump speed with their respective process controls through the PLC. The lime solution is fed after the booster pump station at each plant.

The District's AWS is treated using a Pall Portable Membrane treatment facility. The Pall Aria portable membrane facility consists of two racks of 20 membrane modules each and each rack is rated to operate at a maximum flow rate of 300 gpm. Flow is upward from the outside of the membrane fibers to the inside. The two racks operate independent of each other, but can be run simultaneously. However, if one rack goes through a clean-in-place (CIP) cycle, the filtering rack can only operate at one-half capacity during the other racks backwashing cycle. Each membrane rack is fed raw water through the Gould 20 HP variable frequency drive (VFD) feed pump rated to deliver up to 530 gpm.

3.5. Water Storage and Distribution

GCSD has five storage reservoirs having a total capacity of approximately 2.5 million gallons. The two clearwells have a total capacity of 4.0 million gallons. The clearwells were installed to meet the CT requirements for filtration avoidance. These two tanks are both welded steel construction and each has a capacity of 2.0 million gallons. Access to the tanks is limited due to fencing and secured access ladders to the top of the clearwells. All vents to the tanks are screened.

Tank No. 1 receives water from the Second Garrotte plant and is a ground level welded steel storage tank with a capacity of 500,000 gallons. Tank No. 1 floats on the water system and is equipped with a common inlet and outlet piping arrangement. This tank serves the greater Groveland, Big Oak and Yosemite Highland pressure zones. Water can flow by gravity from Tank No. 1 to Tank No. 3 if necessary. Both Tanks Nos. 1 and 3 are arranged to have water pumped to the system based on elevation and system configuration.

Water is boosted from the Groveland pressure zone into Tank No. 5 by two 30 HP centrifugal pumps that operate in an alternating mode. Tank No. 5 is a ground level bolted steel tank with a top inlet and bottom outlet arrangement that floats on the Yosemite Highlands subdivision. The tank is 16 feet tall and has a capacity of 140,000 gallons. A two foot drop from full in the tank's water level activates the booster pumps.

Tanks Nos. 2, 3 and 4 receive water from the Big Creek plant and serve the Pine Mountain Lake subdivision area. All three tanks are ground level tanks constructed of reinforced concrete with capacities of 750,000 gallons (Tanks Nos. 2 and 3) and 500,000 gallons (Tank No. 4). Tank No. 2 has a separate bottom inlet and bottom outlet. Tank Nos. 3 and 4 each have common inlet/outlets and float on the distribution system. Hydropneumatic systems are located near Tanks Nos. 2 and 4. The hydropneumatic system at Tank No. 4 serves approximately 200 homes in a closed loop pressure zone near the airport in the Pine Mountain Lake subdivision. The pump station consists of a pressure tank and two 40 HP pumps that operate in an alternating mode. The Tank No. 2 pressure system takes water from the tank feed line and serves two homes with future build out at approximately three to four houses. The pressure system consists of two small hydropneumatic tanks and a 3 HP pump capable of

supplying 25 gpm. Water from Tank No. 3 can be pumped through a 50 HP pump to Tank No. 1 if necessary.

The District's distribution system consists primarily of asbestos cement pipe ranging in diameter from 2 to 6 inches and includes some polyvinyl chloride pipe (PVC, AWWA C-900). The AWWA C-900 PVC is used on all new distribution and replacement piping projects. The District has an active leak detection monitoring program that has been quite successful. There are 64 dead ends in the distribution system, but no low pressure water lines. Of the 64 dead ends, 32 of them have some sort of blow off valves. Approximately 80% of the existing connections have pressure reducing valves, and all system services are metered. The District has a water main flushing program and a valve exercising program. In 2011, 32 of the 64 dead ends were flushed and 100 of the 1,072 valves were exercised.

There are some places within the distribution system where the AWWA water-sewer main separation distances are not maintained, but the District is aware of the separation distances and tries to maintain these distances for designs on all new installations. A map of the existing water system facilities is included in Appendix B.

3.6. Project Need

The project is needed to improve the water supply reliability of Groveland and Big Oak Flat and to provide the required infrastructure to meet fire flow requirements. Additional, water mains within the project area are subject to frequent main breaks, which cause disruptions in service and water losses in the system. Providing water distribution system improvements would reduce the water use of the District and lower the cost to operate and maintain the system.

3.6.1. Fire Flow Requirements

GCSD's Water Master Plan modeled the water distribution system using EPANet®, a modeling software developed by the Environmental Protection Agency. The model exposed several areas of concern caused by either undersized pipelines or high elevations. Among the areas that failed to provide adequate water supply during a fire-flow scenario are downtown Groveland, and Big Oak Flat. Low pressures in the downtown Groveland fire scenario are the result of a looped system with 4-in pipelines. The Big Oak Flat deficiencies are a result of the community being served by a single, 6-in deadend pipeline. A 6-in unlooped pipe cannot support fire flows. The fire flow modeling results are included in Appendix C.

Water Flows for fire suppression are listed in Appendix B of the 2013 California Fire Code. Section B105.1 states that: *"The minimum fire-flow and flow duration requirements for one and two-family dwellings having a fire-flow calculation area that does not exceed 3,600 square feet shall be 1,000 gallons per minute for 1 hour."* Section B105.2 states that: *"The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1."* The minimum fire-flow and duration in Table B105.1 is 1,500 gpm for 2 hours. Appendix B of the 2013 California Fire Code is included in Appendix D of this report for reference. All the fire hydrants in the Big Oak Flat Area and most of the hydrants in Downtown Groveland supply less than 500 gpm.

3.6.2. Reliability

Frequent service interruptions caused by main breaks diminish the quality of service that customers expect of GCSD. Despite the efforts to adequately disinfect and flush the water mains after a repair has

been completed, water quality is being compromised at times. This project will improve the existing water distribution system allowing delivery of drinking water that meets drinking water standards and customer expectations.

A major economic driver in Groveland and Big Oak Flat is the highway traffic along Highway 120. Businesses need a reliable water supply without frequent interruptions and require adequate fire flow.

The frequent main breaks in downtown Groveland and Big Oak Flat also cause large amounts of water to be lost. Water is also lost through small unidentified leaks in the distribution system due its deteriorated condition. The construction of new infrastructure will significantly reduce the amount of water losses in the system, increase its overall efficiency and deliver long-term water savings.

SECTION 4 - ALTERNATIVES CONSIDERED

4.1. Description of Alternatives

Three alternatives were considered, including a no project alternative. Alternative I consists of installing improvements along the existing alignment, parallel to the pipes currently in service. Alternative III consist of installing improvements along a new alignment as needed to provide the required flows. In summary, the three Alternative considered are as follows:

- Alternative I – No Project
- Alternative II – Improvements Along Existing Alignment
- Alternative III – Improvements Along Altered Alignment

The project seeks to improve the existing water distribution system. Thus, consolidation or regionalization alternatives were not considered feasible.

4.2. Alternative I - No Project

A no project alternative was considered. The current distribution system cannot provide the required fire flow for most hydrants within Groveland and Big Oak Flat. This alternative was dismissed due to not addressing concerns with the fire flow requirements and reliability.

4.3. Alternative II – Improvements on Existing Alignment

This alternative involves replacing the existing water mains with new mains located along the same alignment as the existing. Both conventional trenching methods and pipe bursting were considered. Conventional construction requires detailed geotechnical investigations and topographical surveys to locate existing utilities that may be impacted by the excavation of the water line. Conventional construction uses heavy equipment to dig the trenches and requires surface restoration of the excavated trench.

Pipe bursting is a method by which the existing pipe is forced outward and opened by a bursting tool. In pipe bursting the existing pipe is used as a guide for inserting the expansion head (part of the bursting tool). The expansion head, typically pulled by a cable rod and winch, increases the area available for the new pipe by pushing the existing pipe radially outward until it cracks. The bursting device pulls the new pipeline behind itself. During the pipe bursting process, the rehabilitated pipe segment must be taken out of service by rerouting flows around it. After the pipe bursting is completed, laterals are re-connected, typically by conventional excavation methods.

Conventional trenching methods are the recommended method. Many of the existing water mains are shallow. Replacing them using pipe bursting methods may disrupt the ground surface which would require significant restoration. This is a particular concern in areas underneath Highway 120 and other streets.

New water mains would be installed parallel to the existing, where needed. Service would be maintained during construction whenever possible. Portions of the existing alignment is located within California Department of Transportation right of way along Highway 120. The alternative requires high

cost trenching and repairing within the highway ROW and additional traffic control needs. Caltrans is not willing to grant permits for performing all required work within the right of way, thus Alternative II was dismissed.

4.4. Alternative III – Improvements on Altered Alignment

This alternative consists of constructing new water mains along a different alignment than the existing in Groveland. This new alignment seeks to avoid the right of way issues present in Alternative II and also seeks to minimize trenching within streets. New, larger water mains would be installed in Groveland and Big Oak Flat to supply the required fire flow and provide a more reliable water distribution system. Improvements in Groveland are significantly different than the existing alignment, as much of the existing water mains are in Caltrans right of way. This requires a new alignment in Groveland. The existing water mains in Big Oak Flat are primarily located outside of Caltrans right of way. New mains can be constructed parallel to the existing alignment. The design will also seek to add loops to the water distribution system to aid in fire flows.

The following are the tentative improvements to the downtown Groveland water distribution system:

- Construct 4,995 linear feet (LF) of 6” water main on the lots to the north of Highway 120.
- Construct 160 LF of 6” water main to connect the existing water main to the new water main north of Highway 120.
- Construct 2,610 LF of 6” water main on the lots to the south of Highway 120 and along Back Street.
- Construct 1,310 LF of 6” water main along Foote Street and extending to the east.
- Construct 2 segments of water main, 440 LF and 290 LF respectively, connecting the new water main south of Highway 120 to the new water main along Foote Street.
- Construct 215 LF of 6” water main along Power House Street connecting the new water main on Back Street to the new water main along Foote Street.
- Construct 385 LF of 6” water main connecting the new water mains north of Highway 120 to the new water mains south of Highway 120.
- Construction of new gate valves, pressure reducing valves and fire hydrants along the new water mains, as needed.

The following are the tentative improvements to the Big Oak Flat water distribution system:

- Replace 2,000 LF of 4” water main with 6” water main along Wards Ferry Road, including two (2) gate valves and three (3) fire hydrants.
- Replace 1,015 LF of 4” water main with 6” water main along Scofield Street including one (1) gate valve and three (3) fire hydrants.
- Replace 1,040 LF of 4” water main with 6” water main along Big Oak Road including one (1) gate valve and one (1) fire hydrant.
- Replace 320 LF of 4” water main with 6” water main along Henderson Street including one (1) gate valve and one (1) fire hydrant.
- Replace 295 LF of 4” water main with 6” water main along Black Road including one (1) gate valve and two (2) fire hydrants.
- Replace 745 LF of 4” water main with 6” water main along Harper Street.

- Replace 250 LF of 4" water main with 6" water main along School Street including two (2) gate valves.
- Replace 1,150 LF of 4" water main with 6" water main along Yates Street including one (1) gate valve and one (1) fire hydrant.
- Replace 305 LF of 4" water main with 6" water main along Vassar Street including one (1) fire hydrant and a crossing underneath highway 120.
- Construct 1,200 LF of 6" pipe along Ward Ferry Road and Scofield Street to loop the system including one (1) new PRV, three (3) new fire hydrants, and two (2) new gate valves.

The following are the tentative improvements to the water distribution system in the White Gulch area:

- Replace 5,170 LF of 6" water main along White Gulch Road, near Highway 120.
- Replace 1,200 LF of 4" water main with 6" water main along Old Highway 120.
- Construction of new gate valves, pressure reducing valves and fire hydrants along the new water mains, as needed.

Figures 4-1, 4-2, and 4-3 show the proposed alignments in Big Oak Flat, Groveland, and White Gulch, respectively. Both conventional trenching methods and pipe bursting were considered for water mains to be replaced. Conventional construction requires detailed geotechnical investigations and topographical surveys to locate existing utilities that may be impacted by the excavation of the sewer line. Conventional construction uses heavy equipment to dig the trenches and requires surface restoration of the excavated trench.

Pipe bursting is a method by which the existing pipe is forced outward and opened by a bursting tool. In pipe bursting the existing pipe is used as a guide for inserting the expansion head (part of the bursting tool). The expansion head, typically pulled by a cable rod and winch, increases the area available for the new pipe by pushing the existing pipe radially outward until it cracks. The bursting device pulls the new pipeline behind itself.

During the pipe bursting process, the rehabilitated pipe segment must be taken out of service by rerouting flows around it. After the pipe bursting is completed, laterals are re-connected, typically by conventional excavation methods.

4.4.1. Annual O&M

The proposed Sewer Collection System Improvement project is a capital improvements project. It does not include new mechanical equipment other than valves. The only maintenance required for the proposed improvements will consist of conventional maintenance of a water distribution system. It is noted that conventional and customary maintenance of the water distribution system will decrease from current levels, due to the replacement of aged mains that frequently break and require emergency maintenance. The rehabilitated water distribution system will require less maintenance in comparison.

Consulting Engineers

Legend

- Existing Water Main
- Proposed New Water Main
- Proposed Replacement of Water Main

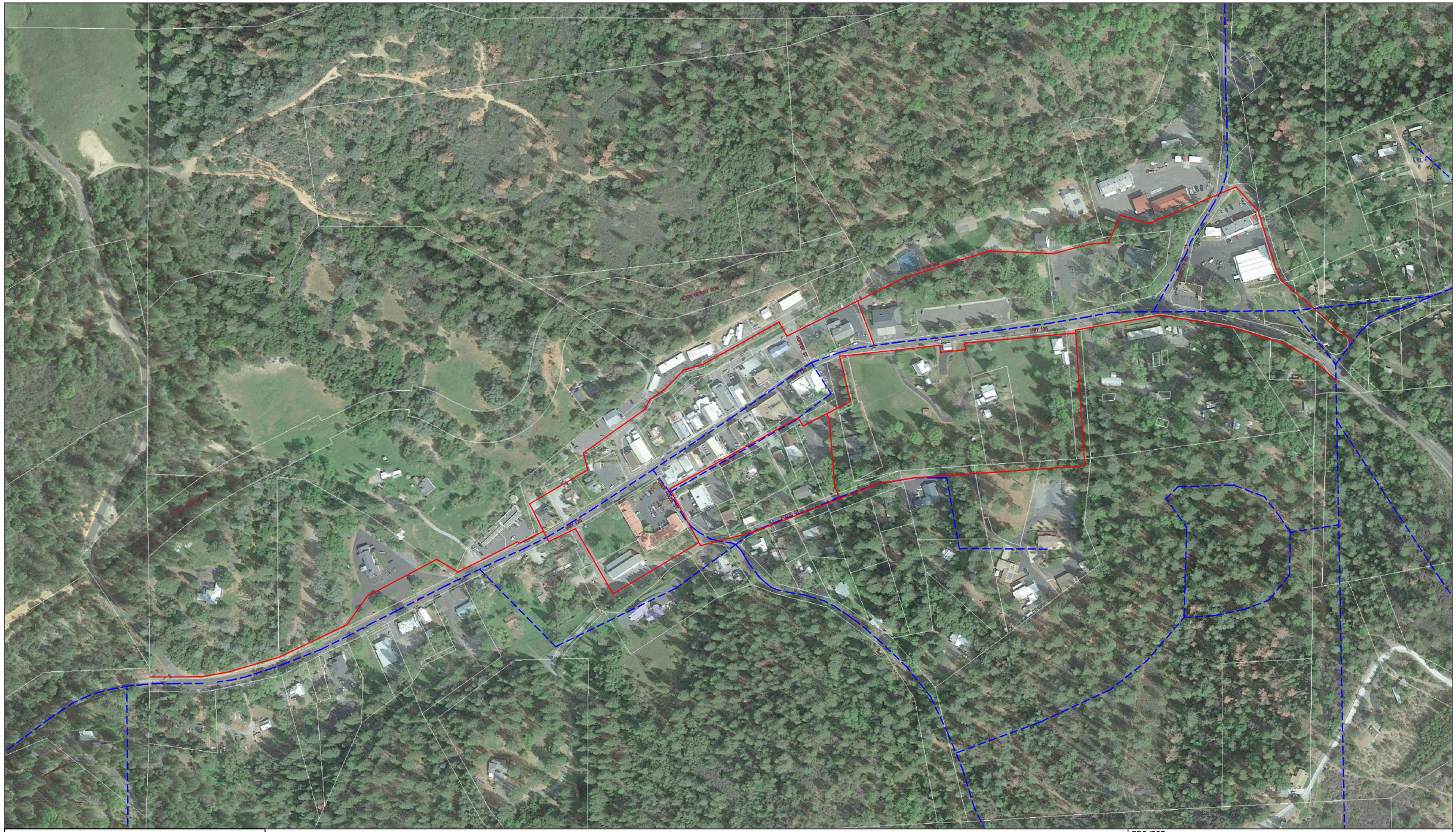
0 175 350 FT

PROJECT

GROVELAND COMMUNITY SERVICES DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS

BIG OAK FLAT WATER SYSTEM IMPROVEMENTS

FIGURE 4-1



Consulting Engineers

Legend

Existing Water Main

Proposed New Water Main

0 150 300 FT

PROJECT

GROVELAND COMMUNITY SERVICES DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS

GROVELAND WATER SYSTEM IMPROVEMENTS

FIGURE 4-2

Consulting Engineers

Legend

Existing Water Main

Proposed Replacement of Water Main

0 175 350 FT

PROJECT

GROVELAND COMMUNITY SERVICES DISTRICT
WATER DISTRIBUTION SYSTEM IMPROVEMENTS

WHITE GULCH WATER SYSTEM IMPROVEMENTS

FIGURE 4-3

SECTION 5 - ALTERNATIVE EVALUATION & RECOMENDATION

5.1. Summary of Alternatives

As discussed previously, the purpose of the water system improvement project is to rehabilitate or replace water mains throughout Groveland and Big Oak Flat to meet fire flow requirements and provide reliable service to customers. The anticipated useful life of new water mains is in excess of 50 years. New laterals will need to be constructed in some locations to connect customers to the new water mains. The three alternatives considered are as follows:

- Alternative I – No Project
- Alternative II – Improvements on Existing Alignment
- Alternative III – Improvements on Altered Alignment

Alternative I was discounted as it does not address the long-term fire flow requirements and reliability needs of GCSD. Alternative II was discounted due to Caltrans not granting permits to perform water main replacement within their right of way.

5.2. Design Criteria/Compliance Issues

Alternatives II and III would require the replacement of existing water mains within Big Oak Flat and Groveland. There are no anticipated design issues, as both alternatives implement standard, common construction methods. These alternatives may include excavation and/or ground disturbance near trees or shrubs.

Alternative III seeks to minimize the amount of excavation performed in streets and highways, such as Highway 120. Encroachment permits may be required if work is located on Caltrans right of way. Easements from property owners will be required if water mains pass through private property. A SWPPP will be required, since the project would disturb over 1 acre of land.

5.3. Recommended Alternative

The alternatives were evaluated for feasibility and design criteria/compliance. It is recommended that design move forward with Alternative III. Alternative III is recommended over Alternative II for a variety of reasons. Some of the existing water mains along Highway 120 are shallow and cannot be rehabilitated in place. A new alignment would be required in these areas. The existing water mains are made of asbestos. It is preferable to abandon these lines in place and construct new mains. Other existing water mains are located deep underground and Alternative III would eliminate those spots with deep lines. Alternative III could be designed to improve accessibility of the water lines, as compared to the existing alignment. Alternative III also minimizes the amount of excavation required along transportation right of way.

5.4. Project Schedule

GCSD has previously signed a planning grant agreement with the State Water Resources Control Board to provide design for water distribution system improvements within Groveland and Big Oak Flat. The agreement includes a project schedule, shown in Table 5-1 below:

Table 5-1 Project Schedule

Task	Date
Geotechnical Investigation & Site Surveying	January 31, 2017
Engineering Design	May 15, 2017
CEQA Documentation	June 30, 2017
Draft Plans and Specifications (60%)	September 30, 2017
Final Plans and Specifications with detailed cost breakdown	December 15, 2017
Logos/Disclosures	As necessary
Status Reports	Quarterly
As Needed Reports	As necessary
Final Disbursement Request	November 31, 2018

APPENDIX A

WATER RATE SCHEDULE

Groveland Community Services District

Summary of Water and Sewer Rates

Water

Monthly Fixed Rate Service Charges

Meter Size	Monthly Fixed Rate Charge
5/8" X 3/4"	$36.28
3/4" X 3/4"	$36.28
1"	$58.05
1 1/2"	$94.32
2"	$126.96
3"	$199.52
4"	$282.95

Usage (Variable) Rate

Gallons Used per Month	Usage Charge per gallon	Usage Rate Category
0 to 3,300	$0.00700	Baseline Usage Rate
>3,301	$0.01385	Peak Demand Usage Rate

Sewer

Monthly Fixed Rate Service Charge and Monthly Usage (Variable) Charge

Service Description	Fixed & Usage Charges	
	Residential	Commercial
Monthly Minimum Charge	53.10	53.10
Monthly Volume Usage Charge	0.00698 per gallon of metered water	0.01121 per gallon of metered water

Bonds/Debt Charges

Charge	Water*	Sewer	Water and Sewer Service
Monthly Fixed Rate/Minimum Charge	$36.28	$53.10	$89.38
2013 Water Debt Service	$6.78		$6.78
2014 Water Debt Service	$8.79		$8.79
2014 Wastewater Debt Service		$25.75**	$25.75
Total Fixed Monthly Rate	**$51.85**	**$78.85**	**$130.70**

*Based on 5/8" meter size

**Not applicable to Groveland/Big Oak Flat accounts not tributary to Lift Station 7

Bonds/Debt and Water & Sewer Rate Information

Bonds/Debt

The District has incurred debt (e.g. revenue bonds) to purchase, upgrade or replace capital improvements such as storage tanks, water and sewer lines, and treatment facilities. Debt is generally repaid on a semi-annual basis over a period of 20 to 30 years. The District collects monthly debt service fees to repay these bonds.

- **2013 Water Debt Service**
  In February 2013, the 1998 Installment Sale Agreement executed to finance the acquisition, construction, and improvement of water storage and treatment facilities was refinanced. The loan was issued for $3,117,831. The monthly payment for this bond is $6.78 and it is paid by all GCSD water customers.

- **2014 Water Debt Service (formerly called 2007 Water Debt Service)**
  This $5,031,500 debt was incurred in May 2007 to pay for federal and state mandated upgrades to the two water treatment plants, construction of an emergency water supply system, and upgrade to the radio telemetry and control (SCADA) system. The District had been collecting $5.13 toward this debt service charge. The monthly amount was increased to $8.79 in May 2007. The loan was refinanced in February 2014. This debt service is paid by all GCSD customers. The installment sale agreement matures in 2027.

- **2014 Wastewater Debt Service (formerly called 2007 Wastewater Debt Service)**
  This $4,059,000 debt was incurred in June 2007 to pay for state mandated upgrades to the District's sixteen sewer lift stations. This loan was refinanced in June 2014. The monthly debt service charge is $25.75 and is paid by customers who are on the sewer systems tributary to Lift Station 7. The installment sale agreement matures in 2027.

Water and Sewer Rates

- **Monthly Fixed Rate/Minimum Charge for Water and Sewer**
  This charge provides for the fixed annual costs of operating the buildings, grounds and facilities of the District, irrespective of the quantity of water used or occupancy status.

- **Water and Sewer Consumption (Variable Rate) Charges for Water and Sewer**
  This charge provides for the variable costs of operation and maintenance of the systems, directly proportional to the amount of water used.

APPENDIX B

EXISTING WATER SYSTEM MAP

Groveland Community Services District

Exhibit 5

Water System Pressure Zone Map

Legend

Water Points
- Booster Pump Station
- Pressure Reducing Station
- Water Tank
- N.C. Gate Valve

Water Mains
- Stream
- River
- Lakes
- Parcels
- District Boundary

Water Mains by Zone
- BOF
- G-S
- GL-C
- GL-SE
- PML-C
- PML-E
- PML-NE
- PML-NW
- PML-S
- PML-SW
- PML-W

County Hydrant Flow Tests
- 1,500 gpm or greater
- 1,000 - 1,499 gpm
- 500 - 999 gpm
- Less than 500 gpm

N

2000 0 2000 Feet

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APPENDIX C

FIRE FLOW MODELING RESULTS

BALANCED WATER SYSTEM

AREAS OF HIGH PRESSURE

PEAK HOUR

MOD. SYSTEM

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 87	2928	0	0.00	-6.07
Resvr 2ndGarrotteRes	2937	#N/A	0.00	0.00
Resvr BigCreekRes	2820	#N/A	-0.00	0.00
Junc 86	2928	0	0.00	0.00
Junc 66	3395	10	20.00	2.53
Tank T3	3004	#N/A	-3034.68	2.60
Tank T4	2912	#N/A	360.17	2.60
Tank T5	3395	#N/A	-80.00	2.60
Tank T1	3136	#N/A	-324.00	2.60
Tank T2	2908	#N/A	596.51	2.60
Junc 27	2912	0	0.00	3.48
Junc 73	2917	0	0.00	8.67
Junc 67	3100	3	6.00	17.49
Junc 91	3100	0	0.00	18.20
Junc 104	3085	0	0.00	22.87
Junc 88	2852	0	0.00	29.95
Junc 5	2852	10	20.00	29.95
Junc 53	2670	15	30.00	31.00
Junc 56	2670	15	30.00	31.00
Junc 76	2900	0	0.00	34.00
Junc 89	2827	25	50.00	37.20

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 90	2750	25	50.00	42.02
Junc 9	3300	15	30.00	43.52
Junc 21	2820	10	20.00	44.97
Junc 48	2827	15	30.00	46.07
Junc 85	2826	0	0.00	46.50
Junc 69	2630	40	80.00	48.09
Junc 11	2773	0	0.00	49.00
Junc 17	2770	20	40.00	50.00
Junc 96	2760	5	10.00	53.70
Junc 102	2930	0	0.00	54.00
Junc 103	2925	12	24.00	54.80
Junc 77	2850	8	16.00	55.56
Junc 70	3010	0	0.00	56.12
Junc 47	2750	10	20.00	58.00
Junc 38	3000	10	20.00	59.90
Junc 37	2856	10	20.00	61.52
Junc 3	2790	22	44.00	61.92
Junc 129	2850	0	0.00	63.02
Junc 78	2825	8	16.00	66.17
Junc 83	2780	15	30.00	66.45
Junc 100	2900	11	22.00	67.00
Junc 31	2773	10	20.00	67.16

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 63	2980	0	0.00	68.99
Junc 72	2580	30	60.00	69.82
Junc 33	2580	11	22.00	70.00
Junc 1	2975	0	0.00	71.15
Junc 42	2820	8	16.00	71.49
Junc 41	2820	8	16.00	73.18
Junc 4	2756	20	40.00	74.26
Junc 59	2880	19	38.00	75.59
Junc 82	2710	30	60.00	75.76
Junc 30	2710	0	0.00	76.00
Junc 14	2743	15	30.00	76.60
Junc 79	2800	8	16.00	76.86
Junc 55	2670	13	26.00	77.03
Junc 46	2750	12	24.00	79.30
Junc 16	2800	10	20.00	81.80
Junc 134	2800	5	10.00	82.13
Junc 133	2800	5	10.00	82.14
Junc 20	2730	40	80.00	82.68
Junc 54	2675	20	40.00	82.71
Junc 130	2800	10	20.00	83.21
Junc 131	2800	5	10.00	83.26
Junc 43	2806	20	40.00	83.55

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 52	2670	20	40.00	84.76
Junc 128	2800	0	0.00	86.40
Junc 132	2795	5	10.00	86.62
Junc 99	2785	0	0.00	86.65
Junc 62	2540	20	40.00	87.21
Junc 60	2850	20	40.00	87.58
Junc 32	2680	0	0.00	89.00
Junc 50	2680	10	20.00	89.00
Junc 101	2930	9	18.00	90.67
Junc 49	2970	0	0.00	91.91
Junc 71	2925	5	10.00	92.73
Junc 127	2785	5	10.00	92.75
Junc 18	2660	25	50.00	97.39
Junc 22	2660	12	24.00	97.64
Junc 40	2910	8	16.00	98.92
Junc 8	2820	17	34.00	101.50
Junc 24	2650	10	20.00	102.03
Junc 75	2900	0	0.00	102.57
Junc 92	2900	5	10.00	103.21
Junc 135	2750	5	10.00	103.82
Junc 98	2900	9	18.00	104.02
Junc 68	2500	30	60.00	104.42

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 13	2680	15	30.00	104.68
Junc 121	2635	5	10.00	107.82
Junc 125	2745	5	10.00	110.08
Junc 119	2630	5	10.00	110.31
Junc 84	2680	10	20.00	111.65
Junc 51	2920	0	0.00	113.56
Junc 2	2705	0	0.00	113.70
Junc 29	2705	20	40.00	113.70
Junc 28	2620	12	24.00	114.94
Junc 7	2710	0	0.00	115.00
Junc 36	2715	25	50.00	116.81
Junc 6	2912	8	16.00	117.90
Junc 44	2680	15	30.00	118.02
Junc 122	2610	5	10.00	118.66
Junc 94	2610	10	20.00	118.77
Junc 93	2610	10	20.00	118.91
Junc 81	2610	20	40.00	118.94
Junc 118	2610	0	0.00	118.99
Junc 65	3125	15	30.00	119.36
Junc 124	2605	10	20.00	120.86
Junc 80	2600	20	40.00	123.02
Junc 123	2600	10	20.00	123.03

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 120	2600	10	20.00	123.07
Junc 45	2600	22	44.00	123.59
Junc 95	2590	5	10.00	127.44
Junc 26	2590	20	40.00	127.92
Junc 12	2590	20	40.00	127.94
Junc 64	2980	0	0.00	128.06
Junc 10	2980	0	0.00	128.06
Junc 23	2880	25	50.00	130.84
Junc 15	2880	25	50.00	130.91
Junc 25	2880	15	30.00	130.92
Junc 61	2430	10	20.00	134.82
Junc 58	2820	10	20.00	137.94
Junc 19	2560	15	30.00	140.52
Junc 97	2560	0	0.00	140.81
Junc 57	2411	16	32.00	143.01
Junc 34	2580	0	0.00	145.56
Junc 39	2777	0	0.00	156.55
Junc 74	2917	0	0.00	187.76
Junc 35	2800	0	0.00	259.98

MAX. DAY

FIRE GL-C

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 87	2928	0	0.00	-6.07
Junc 104	3085	0	0.00	-4.98
Resvr 2ndGarrotteRes	2937	#N/A	0.00	0.00
Resvr BigCreekRes	2820	#N/A	-0.00	0.00
Junc 86	2928	0	0.00	0.00
Junc 66	3395	10	10.00	2.58
Tank T1	3136	#N/A	-1661.95	2.60
Tank T5	3395	#N/A	-40.00	2.60
Tank T4	2912	#N/A	687.29	2.60
Tank T2	2908	#N/A	969.71	2.60
Tank T3	3004	#N/A	-2696.00	2.60
Junc 67	3100	3	3.00	3.62
Junc 27	2912	0	0.00	4.46
Junc 73	2917	0	0.00	8.67
Junc 91	3100	0	0.00	18.20
Junc 70	3010	0	0.00	27.72
Junc 53	2670	15	15.00	31.00
Junc 56	2670	15	15.00	31.00
Junc 5	2852	10	10.00	31.47
Junc 88	2852	0	0.00	31.47
Junc 103	2925	12	12.00	31.55

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 76	2900	0	0.00	34.00
Junc 89	2827	25	25.00	37.56
Junc 63	2980	0	0.00	40.69
Junc 1	2975	0	0.00	42.85
Junc 9	3300	15	15.00	43.70
Junc 48	2827	15	15.00	46.67
Junc 38	3000	10	10.00	46.69
Junc 21	2820	10	10.00	47.05
Junc 85	2826	0	0.00	47.10
Junc 69	2630	40	40.00	48.27
Junc 11	2773	0	0.00	49.00
Junc 17	2770	20	20.00	50.00
Junc 101	2930	9	9.00	52.76
Junc 102	2930	0	0.00	52.76
Junc 96	2760	5	5.00	54.16
Junc 77	2850	8	8.00	55.64
Junc 8	2820	1517	1517.00	57.51
Junc 47	2750	10	10.00	58.45
Junc 37	2856	10	10.00	62.67
Junc 90	2750	25	25.00	63.04
Junc 60	2850	20	20.00	64.13
Junc 129	2850	0	0.00	64.38

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 71	2925	5	5.00	64.49
Junc 3	2790	22	22.00	64.75
Junc 78	2825	8	8.00	66.41
Junc 100	2900	11	11.00	67.00
Junc 83	2780	15	15.00	67.09
Junc 72	2580	30	30.00	69.95
Junc 33	2580	11	11.00	70.00
Junc 31	2773	10	10.00	70.84
Junc 59	2880	19	19.00	73.01
Junc 42	2820	8	8.00	73.05
Junc 41	2820	8	8.00	74.70
Junc 75	2900	0	0.00	75.05
Junc 82	2710	30	30.00	75.93
Junc 30	2710	0	0.00	76.00
Junc 4	2756	20	20.00	76.78
Junc 79	2800	8	8.00	77.20
Junc 14	2743	15	15.00	79.13
Junc 46	2750	12	12.00	80.06
Junc 16	2800	10	10.00	83.56
Junc 134	2800	5	5.00	84.09
Junc 133	2800	5	5.00	84.09
Junc 43	2806	20	20.00	84.41

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 130	2800	10	10.00	84.87
Junc 131	2800	5	5.00	84.93
Junc 20	2730	40	40.00	85.51
Junc 40	2910	8	8.00	85.69
Junc 62	2540	20	20.00	87.30
Junc 128	2800	0	0.00	87.41
Junc 98	2900	9	9.00	87.74
Junc 132	2795	5	5.00	88.06
Junc 99	2785	0	0.00	88.22
Junc 50	2680	10	10.00	89.00
Junc 32	2680	0	0.00	89.06
Junc 92	2900	5	5.00	90.02
Junc 49	2970	0	0.00	92.72
Junc 127	2785	5	5.00	93.80
Junc 18	2660	25	25.00	97.59
Junc 22	2660	12	12.00	97.73
Junc 54	2675	20	20.00	97.80
Junc 55	2670	13	13.00	97.80
Junc 52	2670	20	20.00	99.94
Junc 24	2650	10	10.00	102.12
Junc 68	2500	30	30.00	104.60
Junc 135	2750	5	5.00	105.76

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 13	2680	15	15.00	107.71
Junc 121	2635	5	5.00	108.31
Junc 119	2630	5	5.00	110.57
Junc 125	2745	5	5.00	111.13
Junc 64	2980	0	0.00	111.92
Junc 10	2980	0	0.00	111.92
Junc 84	2680	10	10.00	112.56
Junc 51	2920	0	0.00	114.38
Junc 28	2620	12	12.00	115.06
Junc 2	2705	0	0.00	116.56
Junc 29	2705	20	20.00	116.56
Junc 7	2710	0	0.00	117.75
Junc 6	2912	8	8.00	118.08
Junc 36	2715	25	25.00	119.02
Junc 122	2610	5	5.00	119.14
Junc 94	2610	10	10.00	119.17
Junc 93	2610	10	10.00	119.21
Junc 81	2610	20	20.00	119.22
Junc 118	2610	0	0.00	119.23
Junc 65	3125	15	15.00	119.53
Junc 44	2680	15	15.00	119.81
Junc 124	2605	10	10.00	121.32

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 80	2600	20	20.00	123.46
Junc 123	2600	10	10.00	123.49
Junc 120	2600	10	10.00	123.50
Junc 45	2600	22	22.00	123.68
Junc 58	2820	10	10.00	124.70
Junc 95	2590	5	5.00	127.84
Junc 26	2590	20	20.00	128.04
Junc 12	2590	20	20.00	128.06
Junc 23	2880	25	25.00	131.70
Junc 15	2880	25	25.00	131.71
Junc 25	2880	15	15.00	131.72
Junc 61	2430	10	10.00	134.94
Junc 19	2560	15	15.00	140.85
Junc 97	2560	0	0.00	140.94
Junc 57	2411	16	16.00	143.17
Junc 39	2777	0	0.00	143.32
Junc 34	2580	0	0.00	149.29
Junc 74	2917	0	0.00	187.76
Junc 35	2800	0	0.00	259.98

MAX DAY

FIRE BOF

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 79	2800	1516	1516.00	-1590.80
Junc 78	2825	8	8.00	-905.06
Junc 77	2850	8	8.00	-640.52
Junc 76	2900	0	0.00	-596.48
Junc 75	2900	0	0.00	-596.48
Junc 104	3085	0	0.00	-397.41
Junc 87	2928	0	0.00	-0.43
Resvr 2ndGarrotteRes	2937	#N/A	0.00	0.00
Resvr BigCreekRes	2820	#N/A	-0.00	0.00
Junc 86	2928	0	0.00	0.00
Junc 71	2925	5	5.00	0.43
Junc 103	2925	12	12.00	0.43
Junc 63	2980	0	0.00	1.29
Junc 1	2975	0	0.00	3.45
Tank T2	2908	#N/A	1096.67	8.23
Tank T4	2912	#N/A	699.31	8.23
Junc 73	2917	0	0.00	8.67
Tank T3	3004	#N/A	-2834.98	9.10
Junc 66	3395	10	10.00	9.51
Tank T5	3395	#N/A	-40.00	9.53
Junc 27	2912	0	0.00	10.15

< 0.00 psi

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Tank T1	3136	#N/A	-1669.84	10.40
Junc 67	3100	3	3.00	11.29
Junc 70	3010	0	0.00	25.44
Junc 91	3100	0	0.00	26.00
Junc 56	2670	15	15.00	31.00
Junc 53	2670	15	15.00	31.00
Junc 5	2852	10	10.00	37.19
Junc 88	2852	0	0.00	37.19
Junc 89	2827	25	25.00	43.19
Junc 48	2827	15	15.00	47.27
Junc 85	2826	0	0.00	47.70
Junc 69	2630	40	40.00	48.27
Junc 11	2773	0	0.00	49.00
Junc 17	2770	20	20.00	50.00
Junc 9	3300	15	15.00	50.63
Junc 21	2820	10	10.00	52.82
Junc 102	2930	0	0.00	54.00
Junc 96	2760	5	5.00	54.16
Junc 38	3000	10	10.00	54.36
Junc 47	2750	10	10.00	58.45
Junc 101	2930	9	9.00	59.21
Junc 60	2850	20	20.00	66.51

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 100	2900	11	11.00	67.00
Junc 83	2780	15	15.00	67.69
Junc 90	2750	25	25.00	68.68
Junc 37	2856	10	10.00	69.09
Junc 72	2580	30	30.00	69.95
Junc 33	2580	11	11.00	70.00
Junc 3	2790	22	22.00	70.63
Junc 129	2850	0	0.00	70.79
Junc 59	2880	19	19.00	75.56
Junc 82	2710	30	30.00	75.93
Junc 30	2710	0	0.00	76.00
Junc 31	2773	10	10.00	76.72
Junc 42	2820	8	8.00	78.01
Junc 41	2820	8	8.00	79.95
Junc 46	2750	12	12.00	80.66
Junc 4	2756	20	20.00	82.59
Junc 14	2743	15	15.00	84.88
Junc 62	2540	20	20.00	87.30
Junc 16	2800	10	10.00	88.90
Junc 50	2680	10	10.00	89.00
Junc 32	2680	0	0.00	89.06
Junc 43	2806	20	20.00	90.27

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 134	2800	5	5.00	90.46
Junc 133	2800	5	5.00	90.46
Junc 130	2800	10	10.00	91.25
Junc 20	2730	40	40.00	91.27
Junc 131	2800	5	5.00	91.31
Junc 64	2980	0	0.00	91.65
Junc 10	2980	0	0.00	91.65
Junc 99	2785	0	0.00	93.17
Junc 40	2910	8	8.00	93.37
Junc 128	2800	0	0.00	93.84
Junc 132	2795	5	5.00	94.46
Junc 18	2660	25	25.00	97.59
Junc 92	2900	5	5.00	97.69
Junc 22	2660	12	12.00	97.73
Junc 98	2900	9	9.00	97.84
Junc 49	2970	0	0.00	98.35
Junc 127	2785	5	5.00	100.23
Junc 8	2820	17	17.00	100.69
Junc 24	2650	10	10.00	102.12
Junc 54	2675	20	20.00	103.44
Junc 55	2670	13	13.00	103.44
Junc 68	2500	30	30.00	104.60

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 52	2670	20	20.00	105.57
Junc 121	2635	5	5.00	108.31
Junc 119	2630	5	5.00	110.57
Junc 135	2750	5	5.00	112.13
Junc 13	2680	15	15.00	113.48
Junc 84	2680	10	10.00	113.59
Junc 28	2620	12	12.00	115.06
Junc 125	2745	5	5.00	117.56
Junc 122	2610	5	5.00	119.14
Junc 94	2610	10	10.00	119.17
Junc 93	2610	10	10.00	119.21
Junc 81	2610	20	20.00	119.22
Junc 118	2610	0	0.00	119.23
Junc 51	2920	0	0.00	120.01
Junc 124	2605	10	10.00	121.32
Junc 44	2680	15	15.00	122.26
Junc 29	2705	20	20.00	122.75
Junc 2	2705	0	0.00	122.75
Junc 80	2600	20	20.00	123.46
Junc 123	2600	10	10.00	123.49
Junc 120	2600	10	10.00	123.50
Junc 45	2600	22	22.00	123.68

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 6	2912	8	8.00	123.72
Junc 7	2710	0	0.00	124.01
Junc 36	2715	25	25.00	125.35
Junc 65	3125	15	15.00	126.46
Junc 95	2590	5	5.00	127.84
Junc 26	2590	20	20.00	128.04
Junc 12	2590	20	20.00	128.06
Junc 58	2820	10	10.00	132.37
Junc 61	2430	10	10.00	134.94
Junc 23	2880	25	25.00	137.33
Junc 15	2880	25	25.00	137.35
Junc 25	2880	15	15.00	137.35
Junc 19	2560	15	15.00	140.85
Junc 97	2560	0	0.00	140.94
Junc 57	2411	16	16.00	143.17
Junc 39	2777	0	0.00	150.99
Junc 34	2580	0	0.00	155.04
Junc 74	2917	0	0.00	187.76
Junc 35	2800	0	0.00	259.98

MAX. DAY
PML-W FIRE

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 90	2750	1025	1025.00	-290.06
Junc 55	2670	13	13.00	-161.76
Junc 54	2675	20	20.00	-20.15
Junc 52	2670	20	20.00	-17.99
Junc 87	2928	0	0.00	-6.07
Resvr 2ndGarrotteRes	2937	#N/A	0.00	0.00
Resvr BigCreekRes	2820	#N/A	-0.00	0.00
Junc 86	2928	0	0.00	0.00
Junc 66	3395	10	10.00	2.58
Tank T2	2908	#N/A	96.99	2.60
Tank T1	3136	#N/A	-162.00	2.60
Tank T5	3395	#N/A	-40.00	2.60
Tank T3	3004	#N/A	-2710.02	2.60
Tank T4	2912	#N/A	574.03	2.60
Junc 27	2912	0	0.00	3.98
Junc 73	2917	0	0.00	8.67
Junc 67	3100	3	3.00	18.00
Junc 91	3100	0	0.00	18.20
Junc 104	3085	0	0.00	24.19
Junc 56	2670	15	15.00	29.39
Junc 53	2670	15	15.00	29.41

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 88	2852	0	0.00	30.73
Junc 5	2852	10	10.00	30.73
Junc 76	2900	0	0.00	34.00
Junc 89	2827	25	25.00	35.21
Junc 9	3300	15	15.00	43.70
Junc 21	2820	10	10.00	46.24
Junc 48	2827	15	15.00	46.67
Junc 69	2630	40	40.00	46.72
Junc 85	2826	0	0.00	47.10
Junc 11	2773	0	0.00	49.00
Junc 17	2770	20	20.00	50.00
Junc 102	2930	0	0.00	54.00
Junc 96	2760	5	5.00	54.16
Junc 77	2850	8	8.00	55.64
Junc 103	2925	12	12.00	55.79
Junc 70	3010	0	0.00	56.90
Junc 47	2750	10	10.00	58.45
Junc 38	3000	10	10.00	61.08
Junc 37	2856	10	10.00	62.58
Junc 3	2790	22	22.00	64.03
Junc 129	2850	0	0.00	64.27
Junc 78	2825	8	8.00	66.41

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 100	2900	11	11.00	67.00
Junc 83	2780	15	15.00	67.09
Junc 72	2580	30	30.00	68.38
Junc 63	2980	0	0.00	69.86
Junc 33	2580	11	11.00	70.00
Junc 31	2773	10	10.00	70.12
Junc 1	2975	0	0.00	72.03
Junc 42	2820	8	8.00	73.05
Junc 41	2820	8	8.00	74.70
Junc 59	2880	19	19.00	75.65
Junc 82	2710	30	30.00	75.93
Junc 4	2756	20	20.00	75.98
Junc 30	2710	0	0.00	76.00
Junc 79	2800	8	8.00	77.20
Junc 14	2743	15	15.00	77.51
Junc 46	2750	12	12.00	80.06
Junc 16	2800	10	10.00	83.56
Junc 134	2800	5	5.00	83.94
Junc 133	2800	5	5.00	83.94
Junc 20	2730	40	40.00	84.28
Junc 43	2806	20	20.00	84.41
Junc 130	2800	10	10.00	84.73

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 131	2800	5	5.00	84.80
Junc 62	2540	20	20.00	86.96
Junc 128	2800	0	0.00	87.33
Junc 132	2795	5	5.00	87.95
Junc 99	2785	0	0.00	88.22
Junc 60	2850	20	20.00	88.37
Junc 50	2680	10	10.00	89.00
Junc 32	2680	0	0.00	89.06
Junc 101	2930	9	9.00	91.53
Junc 49	2970	0	0.00	92.72
Junc 71	2925	5	5.00	93.67
Junc 127	2785	5	5.00	93.72
Junc 18	2660	25	25.00	97.59
Junc 22	2660	12	12.00	97.73
Junc 40	2910	8	8.00	100.08
Junc 8	2820	17	17.00	101.62
Junc 24	2650	10	10.00	102.12
Junc 68	2500	30	30.00	103.26
Junc 75	2900	0	0.00	104.23
Junc 92	2900	5	5.00	104.40
Junc 98	2900	9	9.00	104.62
Junc 135	2750	5	5.00	105.61

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 13	2680	15	15.00	106.58
Junc 121	2635	5	5.00	108.31
Junc 119	2630	5	5.00	110.57
Junc 125	2745	5	5.00	111.05
Junc 84	2680	10	10.00	112.56
Junc 51	2920	0	0.00	114.38
Junc 28	2620	12	12.00	115.06
Junc 2	2705	0	0.00	116.20
Junc 29	2705	20	20.00	116.20
Junc 7	2710	0	0.00	117.47
Junc 6	2912	8	8.00	118.08
Junc 36	2715	25	25.00	118.82
Junc 122	2610	5	5.00	119.14
Junc 94	2610	10	10.00	119.17
Junc 93	2610	10	10.00	119.21
Junc 81	2610	20	20.00	119.22
Junc 118	2610	0	0.00	119.23
Junc 65	3125	15	15.00	119.53
Junc 44	2680	15	15.00	119.81
Junc 124	2605	10	10.00	121.32
Junc 80	2600	20	20.00	123.46
Junc 123	2600	10	10.00	123.49

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 120	2600	10	10.00	123.50
Junc 45	2600	22	22.00	123.68
Junc 95	2590	5	5.00	127.84
Junc 26	2590	20	20.00	128.04
Junc 12	2590	20	20.00	128.06
Junc 64	2980	0	0.00	128.58
Junc 10	2980	0	0.00	128.58
Junc 23	2880	25	25.00	131.70
Junc 15	2880	25	25.00	131.71
Junc 25	2880	15	15.00	131.72
Junc 61	2430	10	10.00	134.25
Junc 58	2820	10	10.00	139.08
Junc 19	2560	15	15.00	140.85
Junc 97	2560	0	0.00	140.94
Junc 57	2411	16	16.00	141.96
Junc 34	2580	0	0.00	144.28
Junc 39	2777	0	0.00	157.71
Junc 74	2917	0	0.00	187.76
Junc 35	2800	0	0.00	259.98

MAX. DAY
GL-SE FIRE

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 92	2900	1005	1005.00	-163.64
Junc 38	3000	10	10.00	-112.92
Junc 40	2910	8	8.00	-58.60
Junc 58	2820	10	10.00	-10.49
Junc 87	2928	0	0.00	-6.07
Junc 86	2928	0	0.00	0.00
Resvr 2ndGarrotteRes	2937	#N/A	0.00	0.00
Resvr BigCreekRes	2820	#N/A	-0.00	0.00
Junc 39	2777	0	0.00	0.00
Junc 66	3395	10	10.00	2.58
Tank T5	3395	#N/A	-40.00	2.60
Tank T1	3136	#N/A	-1161.99	2.60
Tank T4	2912	#N/A	687.29	2.60
Tank T3	3004	#N/A	-2696.00	2.60
Tank T2	2908	#N/A	969.71	2.60
Junc 27	2912	0	0.00	4.46
Junc 73	2917	0	0.00	8.67
Junc 67	3100	3	3.00	10.68
Junc 104	3085	0	0.00	16.87
Junc 91	3100	0	0.00	18.20
Junc 53	2670	15	15.00	31.00

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 56	2670	15	15.00	31.00
Junc 5	2852	10	10.00	31.47
Junc 88	2852	0	0.00	31.47
Junc 76	2900	0	0.00	34.00
Junc 89	2827	25	25.00	37.56
Junc 9	3300	15	15.00	43.70
Junc 48	2827	15	15.00	46.67
Junc 21	2820	10	10.00	47.05
Junc 85	2826	0	0.00	47.10
Junc 69	2630	40	40.00	48.27
Junc 11	2773	0	0.00	49.00
Junc 70	3010	0	0.00	49.58
Junc 17	2770	20	20.00	50.00
Junc 102	2930	0	0.00	54.00
Junc 96	2760	5	5.00	54.16
Junc 77	2850	8	8.00	55.64
Junc 103	2925	12	12.00	55.79
Junc 47	2750	10	10.00	58.45
Junc 63	2980	0	0.00	62.54
Junc 37	2856	10	10.00	62.67
Junc 90	2750	25	25.00	63.04
Junc 129	2850	0	0.00	64.38

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 1	2975	0	0.00	64.71
Junc 3	2790	22	22.00	64.75
Junc 78	2825	8	8.00	66.41
Junc 100	2900	11	11.00	67.00
Junc 83	2780	15	15.00	67.09
Junc 72	2580	30	30.00	69.95
Junc 33	2580	11	11.00	70.00
Junc 31	2773	10	10.00	70.84
Junc 42	2820	8	8.00	73.05
Junc 41	2820	8	8.00	74.70
Junc 59	2880	19	19.00	75.65
Junc 82	2710	30	30.00	75.93
Junc 30	2710	0	0.00	76.00
Junc 4	2756	20	20.00	76.78
Junc 79	2800	8	8.00	77.20
Junc 14	2743	15	15.00	79.13
Junc 46	2750	12	12.00	80.06
Junc 16	2800	10	10.00	83.56
Junc 134	2800	5	5.00	84.09
Junc 133	2800	5	5.00	84.09
Junc 101	2930	9	9.00	84.21
Junc 43	2806	20	20.00	84.41

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 130	2800	10	10.00	84.87
Junc 131	2800	5	5.00	84.93
Junc 20	2730	40	40.00	85.51
Junc 71	2925	5	5.00	86.35
Junc 62	2540	20	20.00	87.30
Junc 128	2800	0	0.00	87.41
Junc 132	2795	5	5.00	88.06
Junc 99	2785	0	0.00	88.22
Junc 60	2850	20	20.00	88.37
Junc 50	2680	10	10.00	89.00
Junc 32	2680	0	0.00	89.06
Junc 49	2970	0	0.00	92.72
Junc 127	2785	5	5.00	93.80
Junc 75	2900	0	0.00	96.91
Junc 98	2900	9	9.00	97.30
Junc 18	2660	25	25.00	97.59
Junc 22	2660	12	12.00	97.73
Junc 54	2675	20	20.00	97.80
Junc 55	2670	13	13.00	97.80
Junc 52	2670	20	20.00	99.94
Junc 8	2820	17	17.00	101.62
Junc 24	2650	10	10.00	102.12

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 68	2500	30	30.00	104.60
Junc 135	2750	5	5.00	105.76
Junc 13	2680	15	15.00	107.71
Junc 121	2635	5	5.00	108.31
Junc 119	2630	5	5.00	110.57
Junc 125	2745	5	5.00	111.13
Junc 84	2680	10	10.00	112.56
Junc 51	2920	0	0.00	114.38
Junc 28	2620	12	12.00	115.06
Junc 29	2705	20	20.00	116.56
Junc 2	2705	0	0.00	116.56
Junc 10	2980	0	0.00	116.70
Junc 64	2980	0	0.00	116.70
Junc 7	2710	0	0.00	117.75
Junc 6	2912	8	8.00	118.08
Junc 36	2715	25	25.00	119.02
Junc 122	2610	5	5.00	119.14
Junc 94	2610	10	10.00	119.17
Junc 93	2610	10	10.00	119.21
Junc 81	2610	20	20.00	119.22
Junc 118	2610	0	0.00	119.23
Junc 65	3125	15	15.00	119.53

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 44	2680	15	15.00	119.81
Junc 124	2605	10	10.00	121.32
Junc 80	2600	20	20.00	123.46
Junc 123	2600	10	10.00	123.49
Junc 120	2600	10	10.00	123.50
Junc 45	2600	22	22.00	123.68
Junc 95	2590	5	5.00	127.84
Junc 26	2590	20	20.00	128.04
Junc 12	2590	20	20.00	128.06
Junc 23	2880	25	25.00	131.70
Junc 15	2880	25	25.00	131.71
Junc 25	2880	15	15.00	131.72
Junc 61	2430	10	10.00	134.94
Junc 19	2560	15	15.00	140.85
Junc 97	2560	0	0.00	140.94
Junc 57	2411	16	16.00	143.17
Junc 34	2580	0	0.00	149.29
Junc 74	2917	0	0.00	187.76
Junc 35	2800	0	0.00	259.98

MAX. DAY

PMC-C FIRE

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 121	2635	1005	1005.00	-32.74
Junc 87	2928	0	0.00	-6.07
Resvr 2ndGarrotteRes	2937	#N/A	0.00	0.00
Resvr BigCreekRes	2820	#N/A	-0.00	0.00
Junc 86	2928	0	0.00	0.00
Junc 66	3395	10	10.00	2.58
Tank T4	2912	#N/A	589.09	2.60
Tank T5	3395	#N/A	-40.00	2.60
Tank T1	3136	#N/A	-162.00	2.60
Tank T2	2908	#N/A	771.88	2.60
Tank T3	3004	#N/A	-3399.97	2.60
Junc 27	2912	0	0.00	4.04
Junc 73	2917	0	0.00	8.67
Junc 67	3100	3	3.00	18.00
Junc 91	3100	0	0.00	18.20
Junc 104	3085	0	0.00	24.19
Junc 96	2760	5	5.00	24.29
Junc 5	2852	10	10.00	30.82
Junc 88	2852	0	0.00	30.82
Junc 53	2670	15	15.00	31.00
Junc 56	2670	15	15.00	31.00

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 76	2900	0	0.00	34.00
Junc 89	2827	25	25.00	37.56
Junc 122	2610	5	5.00	38.73
Junc 9	3300	15	15.00	43.70
Junc 48	2827	15	15.00	45.85
Junc 21	2820	10	10.00	46.05
Junc 85	2826	0	0.00	46.28
Junc 69	2630	40	40.00	48.27
Junc 11	2773	0	0.00	49.00
Junc 17	2770	20	20.00	50.00
Junc 102	2930	0	0.00	54.00
Junc 77	2850	8	8.00	55.64
Junc 103	2925	12	12.00	55.79
Junc 70	3010	0	0.00	56.90
Junc 47	2750	10	10.00	58.45
Junc 38	3000	10	10.00	61.08
Junc 37	2856	10	10.00	61.10
Junc 129	2850	0	0.00	62.47
Junc 3	2790	22	22.00	62.85
Junc 90	2750	25	25.00	63.04
Junc 83	2780	15	15.00	66.24
Junc 78	2825	8	8.00	66.41

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 100	2900	11	11.00	67.00
Junc 42	2820	8	8.00	68.58
Junc 31	2773	10	10.00	68.94
Junc 63	2980	0	0.00	69.86
Junc 72	2580	30	30.00	69.95
Junc 33	2580	11	11.00	70.00
Junc 41	2820	8	8.00	70.10
Junc 1	2975	0	0.00	72.03
Junc 82	2710	30	30.00	74.52
Junc 16	2800	10	10.00	74.88
Junc 4	2756	20	20.00	75.38
Junc 59	2880	19	19.00	75.65
Junc 30	2710	0	0.00	76.00
Junc 79	2800	8	8.00	77.20
Junc 14	2743	15	15.00	78.29
Junc 46	2750	12	12.00	79.21
Junc 134	2800	5	5.00	81.44
Junc 133	2800	5	5.00	81.44
Junc 43	2806	20	20.00	81.77
Junc 130	2800	10	10.00	82.49
Junc 131	2800	5	5.00	82.59
Junc 99	2785	0	0.00	83.74

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 20	2730	40	40.00	84.54
Junc 128	2800	0	0.00	86.03
Junc 132	2795	5	5.00	86.10
Junc 62	2540	20	20.00	87.30
Junc 60	2850	20	20.00	88.37
Junc 50	2680	10	10.00	89.00
Junc 32	2680	0	0.00	89.06
Junc 124	2605	10	10.00	91.45
Junc 101	2930	9	9.00	91.53
Junc 127	2785	5	5.00	92.39
Junc 49	2970	0	0.00	92.72
Junc 71	2925	5	5.00	93.67
Junc 18	2660	25	25.00	95.93
Junc 22	2660	12	12.00	97.73
Junc 54	2675	20	20.00	97.80
Junc 55	2670	13	13.00	97.80
Junc 123	2600	10	10.00	98.38
Junc 52	2670	20	20.00	99.94
Junc 40	2910	8	8.00	100.08
Junc 119	2630	5	5.00	100.31
Junc 8	2820	17	17.00	101.62
Junc 94	2610	10	10.00	101.67

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 24	2650	10	10.00	102.12
Junc 120	2600	10	10.00	102.96
Junc 135	2750	5	5.00	103.11
Junc 75	2900	0	0.00	104.23
Junc 92	2900	5	5.00	104.40
Junc 68	2500	30	30.00	104.60
Junc 98	2900	9	9.00	104.62
Junc 13	2680	15	15.00	106.64
Junc 118	2610	0	0.00	108.98
Junc 125	2745	5	5.00	109.72
Junc 95	2590	5	5.00	110.33
Junc 93	2610	10	10.00	110.58
Junc 84	2680	10	10.00	111.13
Junc 2	2705	0	0.00	112.22
Junc 29	2705	20	20.00	112.22
Junc 7	2710	0	0.00	112.87
Junc 81	2610	20	20.00	114.36
Junc 51	2920	0	0.00	114.38
Junc 28	2620	12	12.00	115.06
Junc 36	2715	25	25.00	115.56
Junc 44	2680	15	15.00	116.41
Junc 6	2912	8	8.00	118.08

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Pressure psi
Junc 65	3125	15	15.00	119.53
Junc 80	2600	20	20.00	123.46
Junc 45	2600	22	22.00	123.68
Junc 10	2980	0	0.00	124.45
Junc 64	2980	0	0.00	124.45
Junc 26	2590	20	20.00	128.04
Junc 12	2590	20	20.00	128.06
Junc 23	2880	25	25.00	131.70
Junc 15	2880	25	25.00	131.71
Junc 25	2880	15	15.00	131.72
Junc 61	2430	10	10.00	134.94
Junc 97	2560	0	0.00	135.55
Junc 58	2820	10	10.00	139.08
Junc 19	2560	15	15.00	140.85
Junc 57	2411	16	16.00	143.17
Junc 34	2580	0	0.00	148.46
Junc 39	2777	0	0.00	157.71
Junc 74	2917	0	0.00	187.76
Junc 35	2800	0	0.00	259.98

BALANCED WATER SYSTEM

AREAS OF HIGH VELOCITY

Peak Hour Demand

Network Table - Links

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 113	6	0.00	0.00	0.00	Closed
Pipe 42	16	0.00	0.00	0.00	Closed
Pipe 96	8	0.00	0.00	0.00	Closed
Pipe 104	8	0.00	0.00	0.00	Closed
Pipe 69	6	0.00	0.00	0.00	Closed
Pipe 144	8	0.00	0.00	0.00	Closed
Pump P3	#N/A	0.00	0.00	-580.00	Open
Pump P2	#N/A	0.00	0.00	0.00	Closed
Pipe 14	6	0.00	0.00	0.00	Closed
Valve PRVGL02	4	0.00	0.00	0.00	Closed
Pump P5	#N/A	0.00	0.00	0.00	Closed
Pump P1	#N/A	0.00	0.00	-413.34	Open
Pump P4	#N/A	146.00	0.00	-266.10	Open
Pipe 11	6	0.00	0.00	0.00	Open
Pipe 94	8	0.00	0.00	0.00	Open
Pipe 5	6	0.00	0.00	0.00	Open
Pipe 18	8	0.00	0.00	0.00	Open
Pipe 52	6	1.57	0.02	0.00	Open
Pipe 72	6	1.83	0.02	0.00	Open
Pipe 149	4	1.66	0.04	0.00	Open
Pipe 120	6	-6.29	0.07	0.01	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 54	6	6.76	0.08	0.01	Open
Pipe 63	6	6.76	0.08	0.01	Open
Pipe 10	6	7.33	0.08	0.01	Open
Pipe 59	10	25.72	0.11	0.00	Open
Pipe 64	6	-9.41	0.11	0.02	Open
Pipe 56	6	10.00	0.11	0.02	Open
Pipe 126	6	-10.00	0.11	0.02	Open
Pipe 123	6	10.00	0.11	0.02	Open
Pipe 125	6	10.00	0.11	0.02	Open
Pipe 118	6	-10.00	0.11	0.02	Open
Pipe 131	6	-10.00	0.11	0.02	Open
Pipe 116	6	-10.00	0.11	0.02	Open
Pipe 86	6	-12.11	0.14	0.02	Open
Pipe 45	6	-12.32	0.14	0.03	Open
Pipe 33	6	12.47	0.14	0.03	Open
Valve PRV6	4	5.56	0.14	49.16	Active
Pipe 46	6	13.09	0.15	0.03	Open
Pipe 57	6	13.53	0.15	0.03	Open
Pipe 41	6	14.01	0.16	0.03	Open
Pipe 87	6	-14.44	0.16	0.03	Open
Pipe 102	6	-17.97	0.20	0.05	Open
Pipe 132	6	-20.00	0.23	0.06	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 119	6	-20.00	0.23	0.09	Open
Pipe 105	10	-55.72	0.23	0.03	Open
Pipe 78	8	-36.67	0.23	0.05	Open
Pipe 62	6	22.94	0.26	0.08	Open
Pipe 74	6	-23.44	0.27	0.08	Open
Pipe 32	6	24.15	0.27	0.09	Open
Pipe 79	8	-44.56	0.28	0.07	Open
Pipe 76	8	-46.00	0.29	0.07	Open
Pipe 114	6	26.29	0.30	0.10	Open
Pipe 88	6	26.62	0.30	0.10	Open
Pipe 1	6	-26.62	0.30	0.10	Open
Pipe 47	6	-27.06	0.31	0.11	Open
Pipe 8	4	-12.09	0.31	0.17	Open
Pipe 44	6	-27.56	0.31	0.11	Open
Pipe 89	6	-27.82	0.32	0.11	Open
Pipe 67	6	-28.57	0.32	0.12	Open
Pipe 15	6	29.33	0.33	0.12	Open
Pipe 53	6	-29.34	0.33	0.12	Open
Pipe 106	6	29.56	0.34	0.13	Open
Pipe 55	6	-30.00	0.34	0.13	Open
Pipe 73	6	30.54	0.35	0.13	Open
Pipe 99	4	13.90	0.35	0.23	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 91	6	32.25	0.37	0.15	Open
Pipe 6	8	-58.00	0.37	0.11	Open
Pipe 68	6	35.21	0.40	0.17	Open
Pipe 142	6	35.54	0.40	0.18	Open
Pipe 101	4	16.00	0.41	0.29	Open
Pipe 90	6	-37.33	0.42	0.20	Open
Pipe 100	4	18.10	0.46	0.37	Open
Pipe 37	6	41.54	0.47	0.24	Open
Pipe 95	6	-43.28	0.49	0.26	Open
Pipe 124	6	-43.71	0.50	0.26	Open
Pipe 115	6	46.00	0.52	0.28	Open
Pipe 50	6	46.29	0.53	0.29	Open
Pipe 130	6	46.94	0.53	0.30	Open
Pipe 26	8	84.44	0.54	0.22	Open
Pipe 49	6	48.00	0.54	0.31	Open
Pipe 98	6	48.00	0.54	0.31	Open
Pipe 12	6	48.00	0.54	0.31	Open
Pipe 117	6	-50.00	0.57	0.33	Open
Pipe 145	6	50.09	0.57	0.34	Open
Pipe 9	4	-22.67	0.58	0.56	Open
Pipe 150	4	24.00	0.61	0.62	Open
Pipe 82	8	-96.67	0.62	0.28	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Valve PRV5	4	24.30	0.62	36.19	Active
Pipe 75	6	-54.73	0.62	0.40	Open
Pipe 66	6	54.87	0.62	0.40	Open
Pipe 110	6	-55.80	0.63	0.42	Open
Pipe 109	6	55.80	0.63	0.41	Open
Pipe 136	6	-56.29	0.64	0.42	Open
Pipe 135	6	56.29	0.64	0.42	Open
Pipe 4	6	-58.00	0.66	0.44	Open
Pipe 143	6	-58.17	0.66	0.44	Open
Pipe 2	6	63.53	0.72	0.52	Open
Pipe 127	12	-256.13	0.73	0.33	Open
Pipe 23	6	64.29	0.73	0.53	Open
Pipe 39	6	64.65	0.73	0.54	Open
Pipe 7	4	-29.02	0.74	0.88	Open
Pipe 80	6	-66.00	0.75	0.56	Open
Pipe 25	24	1057.84	0.75	0.12	Open
Pipe 16	6	-66.47	0.75	0.57	Open
Pipe 122	6	73.71	0.84	0.69	Open
Pipe 35	6	73.86	0.84	0.69	Open
Pipe 148	4	34.98	0.89	1.25	Open
Pipe 92	6	80.00	0.91	0.80	Open
Pipe 28	6	-83.19	0.94	0.86	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 31	6	-89.68	1.02	0.99	Open
Pipe 83	8	160.25	1.02	0.71	Open
Pipe 146	6	91.75	1.04	1.03	Open
Pipe 27	6	-92.87	1.05	1.05	Open
Pipe 147	6	102.25	1.16	1.26	Open
Valve PRVBOF	4	48.00	1.23	158.25	Active
Pipe 3	4	-50.94	1.30	2.50	Open
Pipe 107	6	-115.28	1.31	1.57	Open
Pipe 40	6	-118.67	1.35	1.66	Open
Pipe 103	6	-121.25	1.38	1.73	Open
Pipe 36	6	-137.49	1.56	2.18	Open
Pipe 134	6	139.19	1.58	2.23	Open
Pipe 70	6	155.41	1.76	2.74	Open
Pipe 34	6	158.46	1.80	2.84	Open
Valve PRVGL01	4	73.75	1.88	85.43	Active
Pipe 112	10	461.33	1.88	1.70	Open
Pipe 133	6	-169.19	1.92	3.20	Open
Pipe 19	10	-506.17	2.07	2.02	Open
Pipe 121	10	506.17	2.07	2.02	Open
Pipe 93	8	-324.00	2.07	2.63	Open
Valve PRVGL03	4	84.25	2.15	84.64	Active
Valve PRV10	4	85.53	2.18	90.01	Active

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 29	10	-581.97	2.38	2.62	Open
Pipe 17	6	210.09	2.38	4.78	Open
Pipe 71	6	-215.92	2.45	5.03	Open
Pipe 129	6	226.13	2.57	5.48	Open
Pipe 128	6	236.13	2.68	5.94	Open
Pipe 30	10	-691.65	2.83	3.61	Open
Pipe 13	12	1032.13	2.93	4.37	Open
Valve PRV3	4	115.41	2.95	124.07	Active
Valve PRV4	4	118.67	3.03	174.39	Active
Pipe 140	12	1081.00	3.07	3.40	Open
Pipe 139	12	1081.00	3.07	3.40	Open
Pipe 138	12	1101.00	3.12	3.51	Open
Pipe 141	12	1107.95	3.14	3.55	Open
Pipe 43	12	1111.60	3.15	3.58	Open
Pipe 48	12	-1197.14	3.40	4.10	Open
Valve PRV8	4	138.46	3.54	41.90	Active
Pipe 21	10	-869.15	3.55	5.51	Open
Valve PRV7	4	139.92	3.57	106.23	Active
Pipe 137	12	1357.14	3.85	5.17	Open
Valve PRV2	4	168.73	4.31	66.98	Active
Pipe 20	10	1057.84	4.32	7.93	Open
Pipe 24	10	-1071.60	4.38	8.12	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
Pipe 111	6	411.33	4.67	16.60	Open
Pipe 108	10	-1167.40	4.77	9.52	Open
Pipe 60	10	1366.13	5.58	12.73	Open
Valve PRV11	4	219.42	5.60	103.39	Active
Pipe 38	10	1382.13	5.65	13.01	Open
Pipe 65	10	-1427.46	5.83	13.81	Open
Valve PSVT2	8	1057.84	6.75	14.00	Active
Pipe 51	10	1677.55	6.85	18.62	Open
Valve PRV9	6	1111.60	12.61	0.00	Open
Valve PRV1	6	1382.13	15.68	0.00	Open

MAX - DAY

GL-C FIRE

Network Table - Links

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 69	6	0.00	0.00	Closed
Pipe 113	6	0.00	0.00	Closed
Pipe 42	16	0.00	0.00	Closed
Pipe 104	8	0.00	0.00	Closed
Pipe 14	6	0.00	0.00	Closed
Pipe 96	8	0.00	0.00	Closed
Pipe 144	8	0.00	0.00	Closed
Pump P3	#N/A	0.00	0.00	Open
Valve PRV5	4	0.00	0.00	Closed
Valve PRV6	4	0.00	0.00	Closed
Valve PRVGL02	4	0.00	0.00	Closed
Pump P2	#N/A	0.00	0.00	Closed
Pump P5	#N/A	0.00	0.00	Closed
Pump P1	#N/A	0.00	0.00	Open
Pump P4	#N/A	73.00	0.00	Open
Pipe 32	6	0.00	0.00	Open
Pipe 94	8	0.00	0.00	Open
Pipe 11	6	0.00	0.00	Open
Pipe 5	6	0.00	0.00	Open
Pipe 18	8	0.00	0.00	Open
Pipe 72	6	1.13	0.01	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 118	12	-5.00	0.01	Open
Pipe 33	6	1.26	0.01	Open
Pipe 120	6	-3.19	0.04	Open
Pipe 54	6	3.38	0.04	Open
Pipe 63	6	3.38	0.04	Open
Pipe 10	6	3.66	0.04	Open
Pipe 64	6	-4.71	0.05	Open
Pipe 123	6	5.00	0.06	Open
Pipe 116	6	-5.00	0.06	Open
Pipe 56	6	5.00	0.06	Open
Pipe 131	6	-5.00	0.06	Open
Pipe 126	6	-5.00	0.06	Open
Pipe 125	6	5.00	0.06	Open
Pipe 86	6	-6.14	0.07	Open
Pipe 57	6	6.76	0.08	Open
Pipe 102	6	-8.78	0.10	Open
Pipe 87	6	-10.00	0.11	Open
Pipe 132	6	-10.00	0.11	Open
Pipe 119	6	-10.00	0.11	Open
Pipe 78	8	-18.72	0.12	Open
Pipe 62	6	11.47	0.13	Open
Pipe 74	6	-11.62	0.13	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 106	6	12.00	0.14	Open
Pipe 79	8	-22.59	0.14	Open
Pipe 76	8	-23.00	0.15	Open
Pipe 114	6	13.19	0.15	Open
Pipe 1	6	-13.25	0.15	Open
Pipe 45	6	-13.26	0.15	Open
Pipe 47	6	-13.53	0.15	Open
Pipe 67	6	-14.25	0.16	Open
Pipe 53	6	14.44	0.16	Open
Pipe 88	6	14.67	0.17	Open
Pipe 55	6	-15.00	0.17	Open
Pipe 73	6	15.16	0.17	Open
Pipe 89	6	-15.33	0.17	Open
Pipe 99	4	6.95	0.18	Open
Pipe 41	6	15.91	0.18	Open
Pipe 91	6	16.20	0.18	Open
Pipe 6	8	-29.00	0.19	Open
Pipe 46	6	16.84	0.19	Open
Pipe 142	6	17.80	0.20	Open
Pipe 68	6	17.88	0.20	Open
Pipe 101	4	8.00	0.20	Open
Pipe 90	6	-18.67	0.21	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 52	6	19.60	0.22	Open
Pipe 100	4	9.05	0.23	Open
Pipe 95	6	-21.60	0.25	Open
Pipe 124	6	-21.81	0.25	Open
Pipe 115	6	23.00	0.26	Open
Pipe 50	6	23.19	0.26	Open
Pipe 44	6	-23.68	0.27	Open
Pipe 98	6	24.00	0.27	Open
Pipe 49	6	-24.00	0.27	Open
Pipe 12	6	24.00	0.27	Open
Pipe 117	6	-25.00	0.28	Open
Pipe 26	8	45.00	0.29	Open
Pipe 9	4	-11.34	0.29	Open
Pipe 150	4	12.00	0.31	Open
Pipe 75	6	-27.25	0.31	Open
Pipe 66	6	27.37	0.31	Open
Pipe 82	8	-48.72	0.31	Open
Pipe 136	6	-28.19	0.32	Open
Pipe 135	6	28.19	0.32	Open
Pipe 4	6	-29.00	0.33	Open
Pipe 143	6	-29.00	0.33	Open
Pipe 59	10	81.97	0.33	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Valve PRV10	4	13.76	0.35	Active
Pipe 2	6	31.76	0.36	Open
Pipe 23	6	32.42	0.37	Open
Pipe 80	6	-33.00	0.37	Open
Pipe 16	6	-33.24	0.38	Open
Pipe 37	6	34.66	0.39	Open
Pipe 105	10	-96.97	0.40	Open
Pipe 122	6	36.81	0.42	Open
Pipe 92	6	40.00	0.45	Open
Pipe 110	6	47.81	0.54	Open
Pipe 109	6	-47.81	0.54	Open
Pipe 130	6	52.21	0.59	Open
Pipe 39	6	52.52	0.60	Open
Valve PRVBOF	4	24.00	0.61	Active
Pipe 127	12	-217.04	0.62	Open
Pipe 31	6	-56.00	0.64	Open
Pipe 35	6	57.91	0.66	Open
Pipe 40	6	-59.72	0.68	Open
Pipe 103	6	-60.38	0.69	Open
Pipe 15	6	-66.00	0.75	Open
Pipe 25	24	1199.99	0.85	Open
Pipe 70	6	77.53	0.88	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 112	10	230.28	0.94	Open
Pipe 28	6	-106.53	1.21	Open
Pipe 71	6	-107.75	1.22	Open
Pipe 34	6	120.44	1.37	Open
Pipe 36	6	-121.53	1.38	Open
Pipe 27	6	-122.53	1.39	Open
Pipe 107	6	-123.97	1.41	Open
Valve PRV3	4	57.53	1.47	Active
Pipe 134	6	129.82	1.47	Open
Valve PRV4	4	59.72	1.52	Active
Pipe 133	6	-144.82	1.64	Open
Valve PRV7	4	69.75	1.78	Active
Pipe 149	4	79.60	2.03	Open
Pipe 17	6	185.38	2.10	Open
Valve PRV2	4	87.42	2.23	Active
Pipe 129	6	202.04	2.29	Open
Pipe 111	6	205.28	2.33	Open
Pipe 128	6	207.04	2.35	Open
Pipe 139	12	959.17	2.72	Open
Pipe 140	12	959.17	2.72	Open
Pipe 138	12	969.17	2.75	Open
Valve PRV11	4	109.38	2.79	Active

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Valve PRV8	4	110.44	2.82	Active
Pipe 141	12	1001.38	2.84	Open
Pipe 29	10	-722.48	2.95	Open
Pipe 43	12	1092.44	3.10	Open
Pipe 121	10	760.29	3.11	Open
Pipe 19	10	-760.29	3.11	Open
Pipe 48	12	-1106.20	3.14	Open
Pipe 13	12	1118.03	3.17	Open
Pipe 30	10	-788.48	3.22	Open
Pipe 137	12	1186.20	3.37	Open
Pipe 21	10	-930.01	3.80	Open
Pipe 7	4	151.72	3.87	Open
Pipe 145	6	349.58	3.97	Open
Pipe 24	10	-1072.45	4.38	Open
Pipe 148	4	183.72	4.69	Open
Pipe 20	10	1199.99	4.90	Open
Pipe 146	6	449.13	5.10	Open
Pipe 108	10	-1251.99	5.11	Open
Pipe 65	10	-1304.41	5.33	Open
Pipe 60	10	1354.41	5.53	Open
Pipe 38	10	1362.41	5.57	Open
Pipe 51	10	1509.80	6.17	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 83	8	1176.82	7.51	Open
Valve PSVT2	8	1199.99	7.66	Active
Pipe 8	4	-330.58	8.44	Open
Pipe 93	8	-1661.95	10.61	Open
Valve PRVGL01	4	440.13	11.24	Active
Valve PRV9	6	1092.45	12.40	Open
Pipe 147	6	1147.82	13.02	Open
Valve PRV1	6	1362.41	15.46	Open
Pipe 3	4	-1034.70	26.42	Open
Valve PRVGL03	4	1138.82	29.08	Open

Max. Day
Fire BOF

Network Table - Links

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 113	6	0.00	0.00	Closed
Pipe 42	16	0.00	0.00	Closed
Pipe 96	8	0.00	0.00	Closed
Pipe 69	6	0.00	0.00	Closed
Pipe 14	6	0.00	0.00	Closed
Pipe 144	8	0.00	0.00	Closed
Pipe 104	8	0.00	0.00	Closed
Pump P2	#N/A	0.00	0.00	Closed
Valve PRV5	4	0.00	0.00	Closed
Valve PRV6	4	0.00	0.00	Closed
Pump P4	#N/A	73.00	0.00	Open
Pump P3	#N/A	0.00	0.00	Open
Pump P5	#N/A	0.00	0.00	Closed
Pump P1	#N/A	0.00	0.00	Open
Pipe 32	6	0.00	0.00	Open
Pipe 94	8	0.00	0.00	Open
Pipe 18	8	0.00	0.00	Open
Pipe 5	6	0.00	0.00	Open
Pipe 11	6	-0.00	0.00	Open
Pipe 72	6	1.13	0.01	Open
Pipe 33	6	1.26	0.01	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 120	6	-3.19	0.04	Open
Pipe 54	6	3.38	0.04	Open
Pipe 63	6	3.38	0.04	Open
Pipe 10	6	3.66	0.04	Open
Pipe 149	4	1.75	0.04	Open
Pipe 64	6	-4.71	0.05	Open
Pipe 123	6	5.00	0.06	Open
Pipe 118	6	-5.00	0.06	Open
Pipe 116	6	-5.00	0.06	Open
Pipe 131	6	-5.00	0.06	Open
Pipe 126	6	-5.00	0.06	Open
Pipe 125	6	5.00	0.06	Open
Pipe 56	6	5.00	0.06	Open
Pipe 86	6	-6.14	0.07	Open
Pipe 57	6	6.76	0.08	Open
Pipe 102	6	-8.78	0.10	Open
Pipe 87	6	-10.00	0.11	Open
Pipe 119	6	-10.00	0.11	Open
Pipe 132	6	-10.00	0.11	Open
Pipe 78	8	-18.72	0.12	Open
Pipe 62	6	11.47	0.13	Open
Pipe 74	6	-11.62	0.13	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 106	6	12.00	0.14	Open
Pipe 79	8	-22.59	0.14	Open
Pipe 76	8	-23.00	0.15	Open
Pipe 114	6	13.19	0.15	Open
Pipe 1	6	-13.25	0.15	Open
Pipe 45	6	-13.26	0.15	Open
Pipe 47	6	-13.53	0.15	Open
Pipe 67	6	-14.25	0.16	Open
Pipe 53	6	14.44	0.16	Open
Pipe 88	6	14.67	0.17	Open
Pipe 55	6	-15.00	0.17	Open
Pipe 73	6	15.16	0.17	Open
Pipe 89	6	-15.33	0.17	Open
Pipe 41	6	15.91	0.18	Open
Pipe 91	6	16.20	0.18	Open
Pipe 46	6	16.84	0.19	Open
Pipe 142	6	17.80	0.20	Open
Pipe 68	6	17.88	0.20	Open
Pipe 90	6	-18.67	0.21	Open
Pipe 52	6	19.60	0.22	Open
Pipe 95	6	-21.60	0.25	Open
Pipe 124	6	-21.81	0.25	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 115	6	23.00	0.26	Open
Pipe 50	6	23.19	0.26	Open
Pipe 44	6	-23.68	0.27	Open
Pipe 117	6	-25.00	0.28	Open
Pipe 26	8	45.00	0.29	Open
Pipe 9	4	-11.34	0.29	Open
Pipe 75	6	-27.25	0.31	Open
Pipe 66	6	27.37	0.31	Open
Pipe 82	8	-48.72	0.31	Open
Pipe 135	6	28.19	0.32	Open
Pipe 136	6	-28.19	0.32	Open
Pipe 143	6	-29.00	0.33	Open
Valve PRV10	4	13.76	0.35	Active
Pipe 2	6	31.76	0.36	Open
Pipe 23	6	32.42	0.37	Open
Pipe 80	6	-33.00	0.37	Open
Pipe 16	6	-33.24	0.38	Open
Pipe 59	10	94.56	0.39	Open
Pipe 37	6	34.66	0.39	Open
Pipe 122	6	36.81	0.42	Open
Pipe 105	10	-109.56	0.45	Open
Pipe 92	6	40.00	0.45	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 110	6	49.33	0.56	Open
Pipe 109	6	-49.33	0.56	Open
Pipe 39	6	52.52	0.60	Open
Pipe 130	6	52.89	0.60	Open
Pipe 127	12	-219.14	0.62	Open
Pipe 31	6	-56.18	0.64	Open
Pipe 35	6	57.91	0.66	Open
Pipe 40	6	-59.72	0.68	Open
Pipe 145	6	60.10	0.68	Open
Pipe 103	6	-60.38	0.69	Open
Pipe 70	6	77.53	0.88	Open
Pipe 15	6	-80.51	0.91	Open
Pipe 146	6	82.45	0.94	Open
Pipe 112	10	230.28	0.94	Open
Pipe 25	24	1326.94	0.94	Open
Pipe 8	4	-41.10	1.05	Open
Pipe 71	6	-107.75	1.22	Open
Pipe 28	6	-107.87	1.22	Open
Pipe 34	6	120.44	1.37	Open
Pipe 36	6	-122.87	1.39	Open
Pipe 27	6	-124.05	1.41	Open
Valve PRV3	4	57.53	1.47	Active

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 134	6	131.25	1.49	Open
Valve PRV4	4	59.72	1.52	Active
Pipe 107	6	-136.56	1.55	Open
Pipe 133	6	-146.25	1.66	Open
Valve PRV7	4	69.75	1.78	Active
Valve PRVGL01	4	73.45	1.88	Active
Valve PRV2	4	87.42	2.23	Active
Pipe 17	6	199.89	2.27	Open
Pipe 129	6	204.14	2.32	Open
Pipe 111	6	205.28	2.33	Open
Pipe 128	6	209.14	2.37	Open
Pipe 140	12	969.08	2.75	Open
Pipe 139	12	969.08	2.75	Open
Pipe 138	12	979.08	2.78	Open
Valve PRV11	4	109.38	2.79	Active
Valve PRV8	4	110.44	2.82	Active
Pipe 141	12	1011.98	2.87	Open
Pipe 29	10	-732.98	2.99	Open
Pipe 43	12	1104.47	3.13	Open
Pipe 19	10	-772.31	3.15	Open
Pipe 121	10	772.31	3.15	Open
Pipe 48	12	-1118.23	3.17	Open

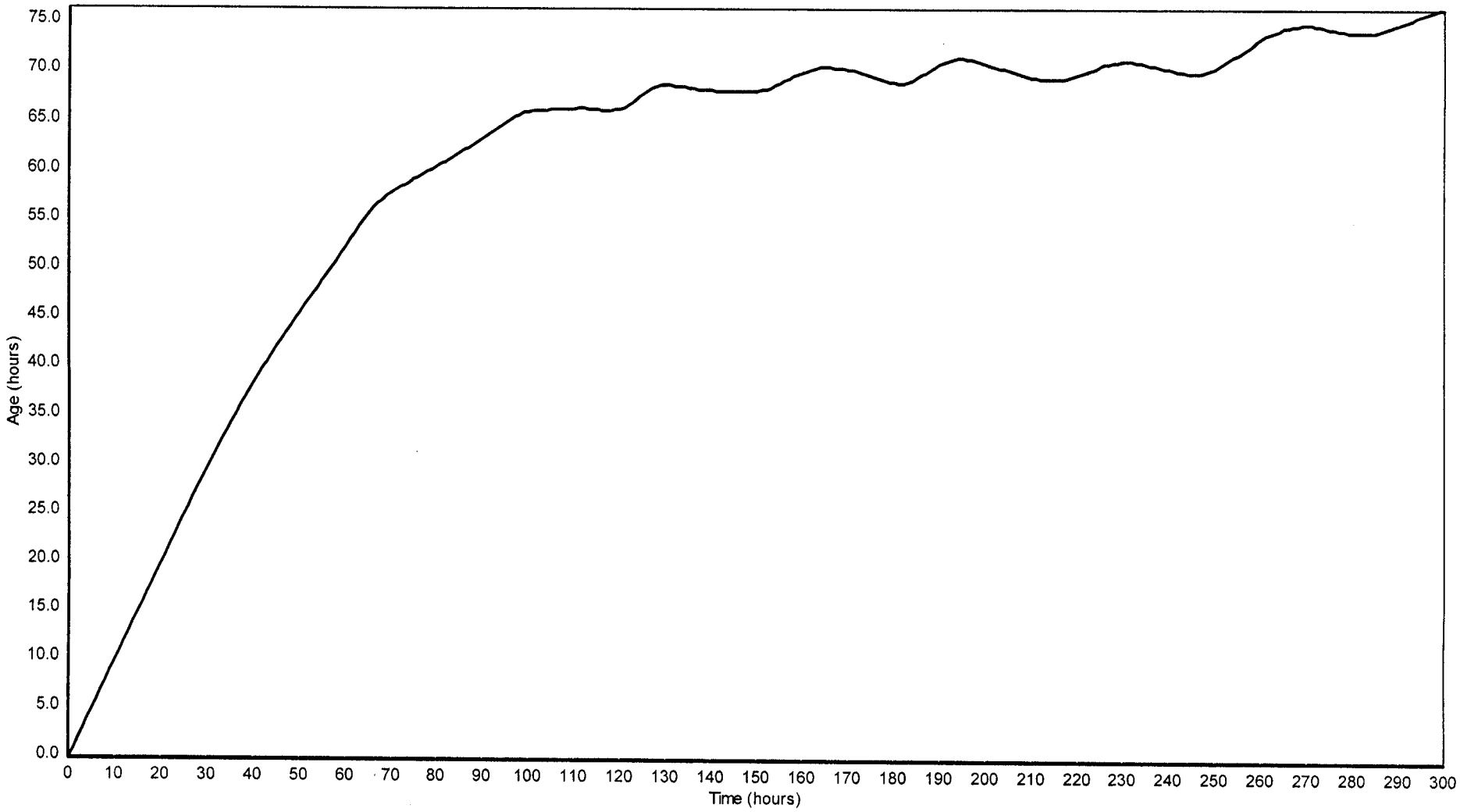
Link ID	Diameter in	Flow GPM	Velocity fps	Status
Pipe 30	10	-799.16	3.26	Open
Pipe 137	12	1198.23	3.40	Open
Pipe 3	4	-134.03	3.42	Open
Pipe 13	12	1232.38	3.50	Open
Pipe 147	6	319.31	3.62	Open
Pipe 21	10	-942.04	3.85	Open
Pipe 7	4	-158.13	4.04	Open
Pipe 24	10	-1084.47	4.43	Open
Pipe 148	4	178.79	4.56	Open
Pipe 20	10	1326.94	5.42	Open
Pipe 108	10	-1378.94	5.63	Open
Pipe 65	10	-1416.86	5.79	Open
Pipe 60	10	1481.37	6.05	Open
Pipe 38	10	1489.37	6.08	Open
Pipe 51	10	1636.75	6.69	Open
Valve PRVGL02	4	304.92	7.78	Open
Pipe 6	8	-1232.08	7.86	Open
Valve PRVGL03	4	310.31	7.92	Active
Pipe 150	4	316.92	8.09	Open
Valve PSVT2	8	1326.94	8.47	Active
Pipe 83	8	1551.39	9.90	Open
Pipe 93	8	-1669.84	10.66	Open

Link ID	Diameter in	Flow GPM	Velocity fps	Status
Valve PRV9	6	1104.47	12.53	Open
Pipe 4	6	-1232.08	13.98	Open
Valve PRV1	6	1489.37	16.90	Open
Pipe 99	4	662.11	16.90	Open
Pipe 49	6	1532.00	17.38	Open
Pipe 98	6	1532.00	17.38	Open
Pipe 12	6	1532.00	17.38	Open
Pipe 100	4	861.89	22.00	Open
Pipe 101	4	1516.00	38.71	Open
Valve PRVBOF	4	1532.00	39.11	Open

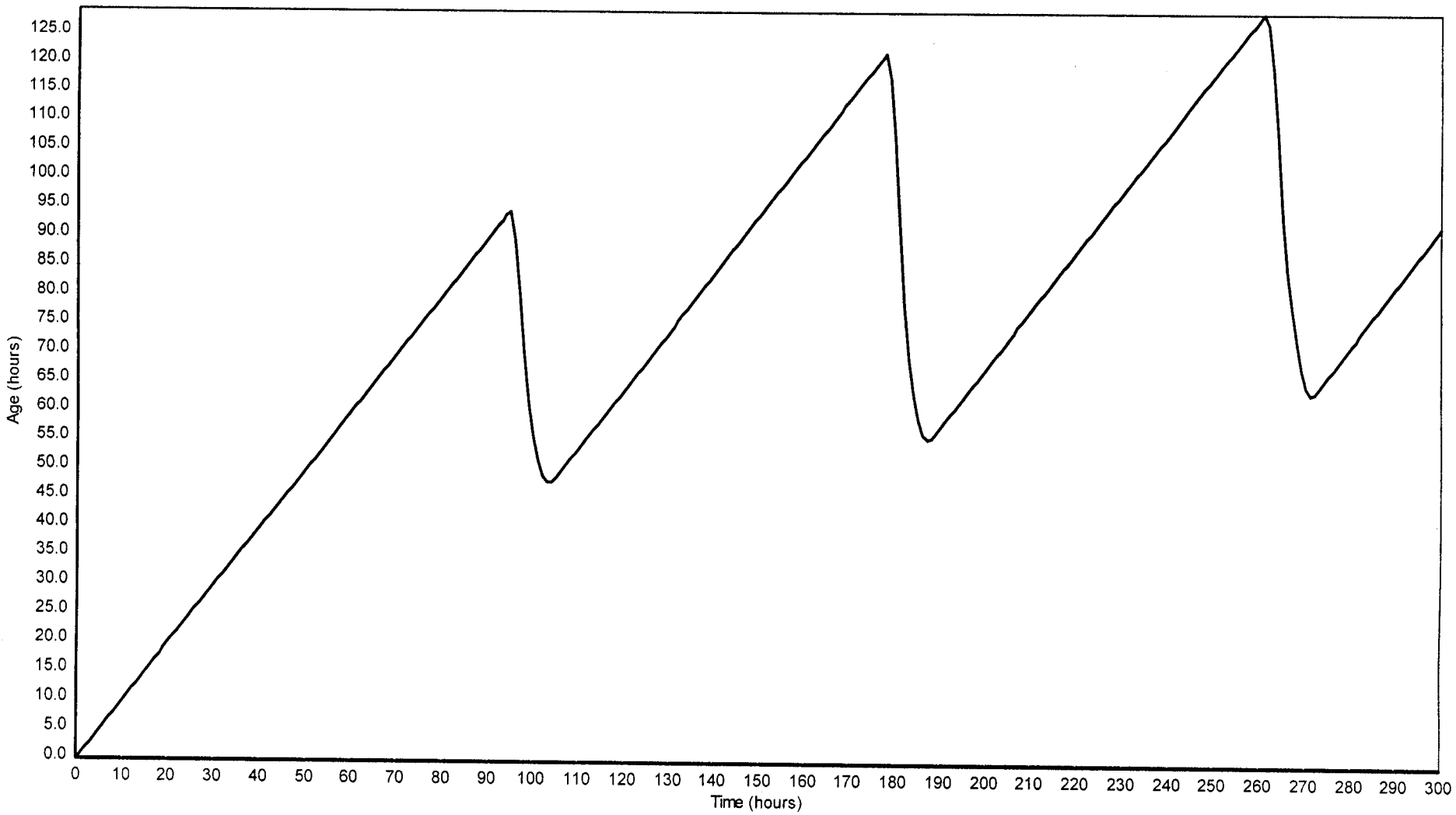
BALANCED WATER SYSTEM

MAXIMUM DAY DEMAND
WATER AGE BY PRESS. ZONE

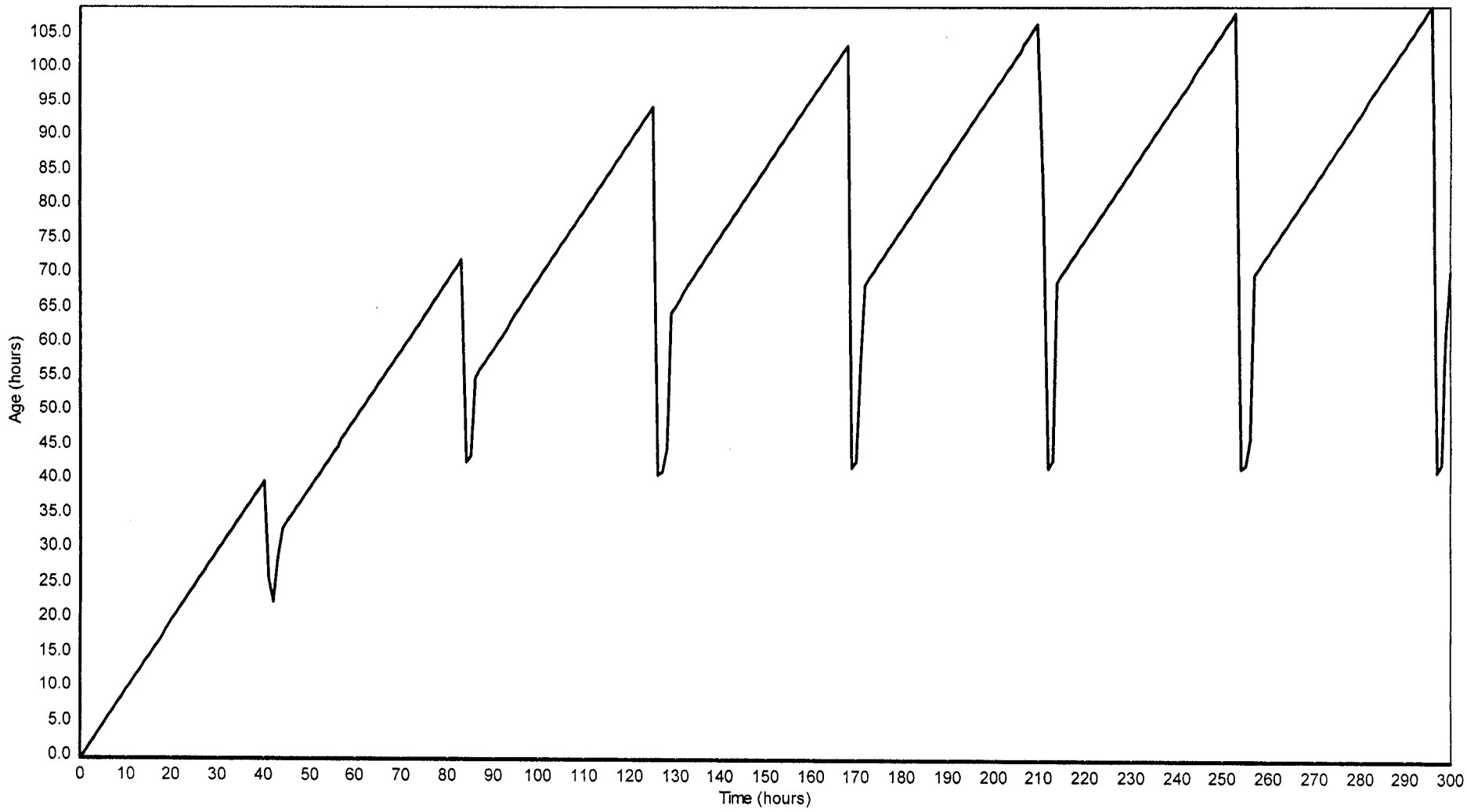
MAX. DAY LINK WATER AGE FOR PML-NW



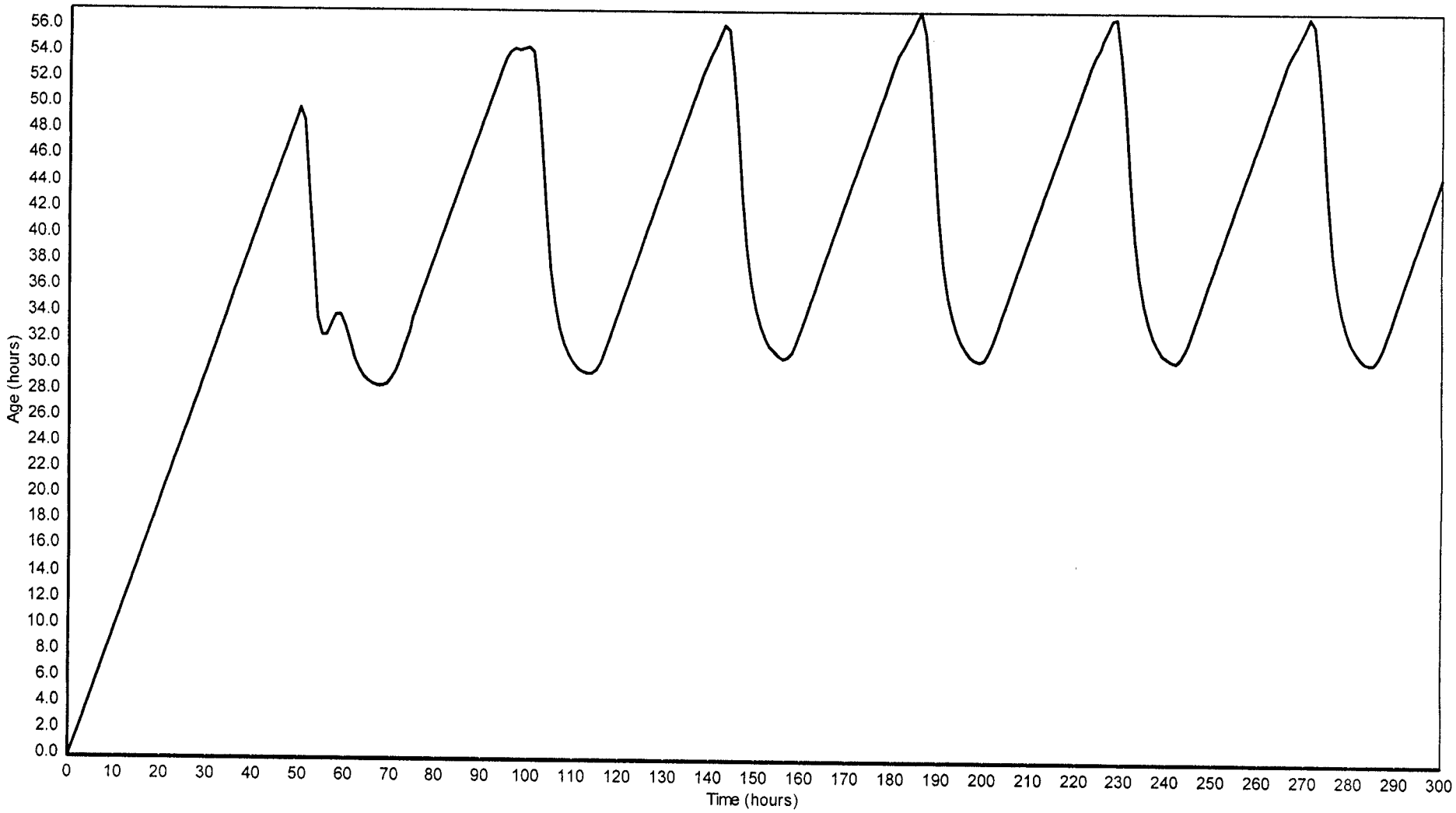
MAX. DAY LINK WATER AGE FOR PML-NE



MAX. DAY LINK WATER AGE FOR GL-S



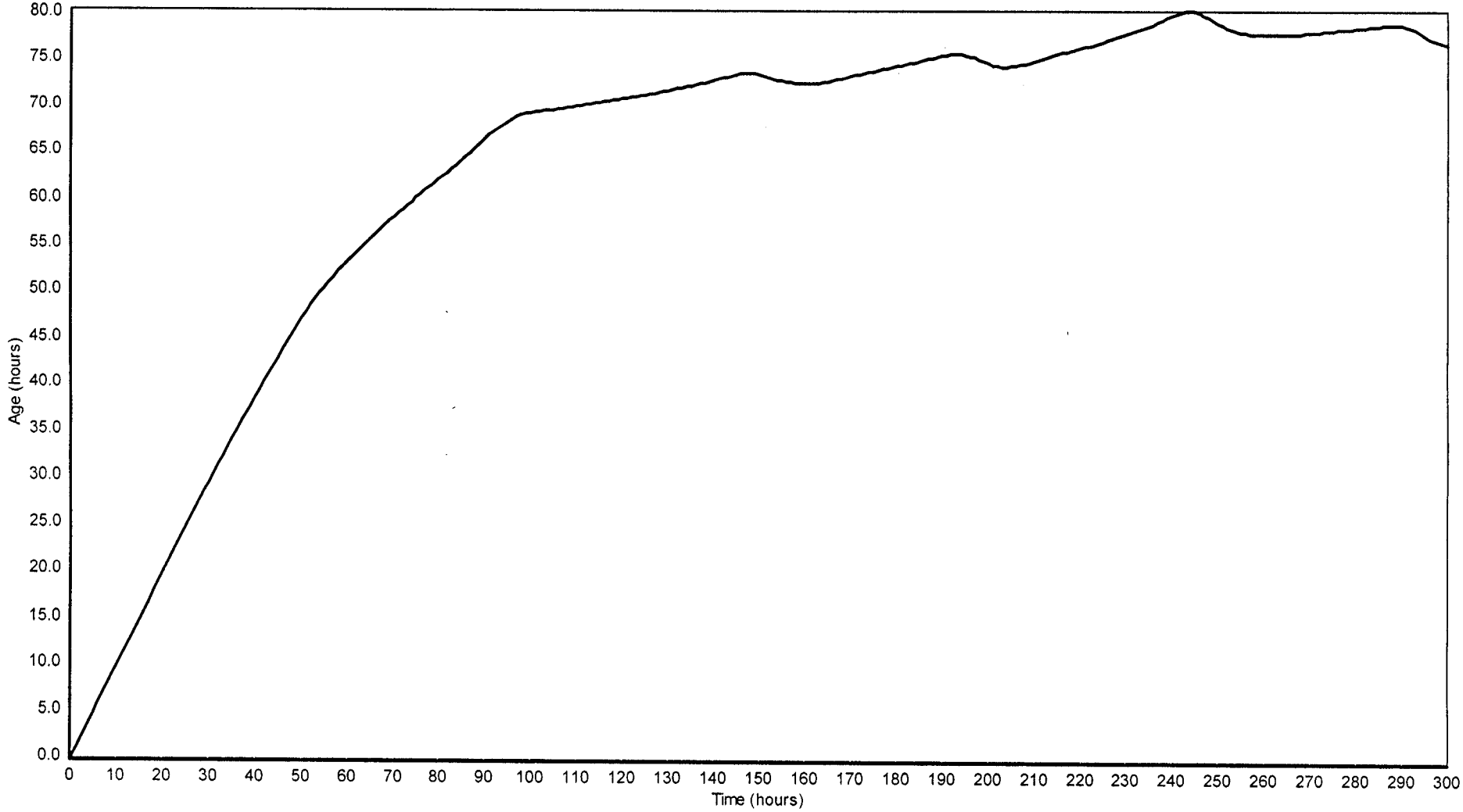
MAX. DAY LINK WATER AGE FOR BOF



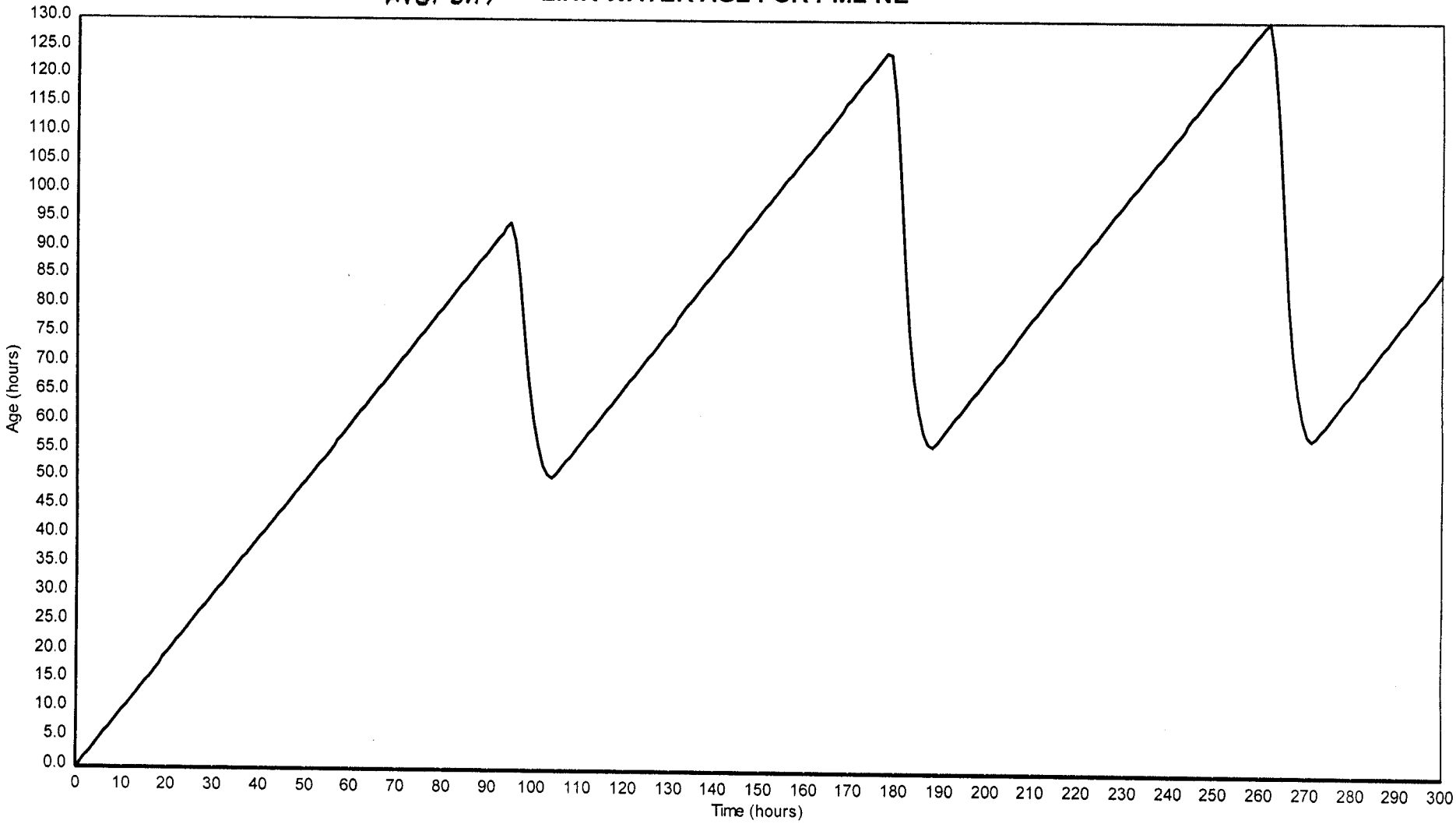
BALANCED WATER SYSTEM

AVERAGE DAY DEMAND
WATER AGE BY PRESS. ZONE

AVG. DAY **LINK WATER AGE FOR PML-NW**



AVG. DAY **LINK WATER AGE FOR PML-NE**



AVG. DAY

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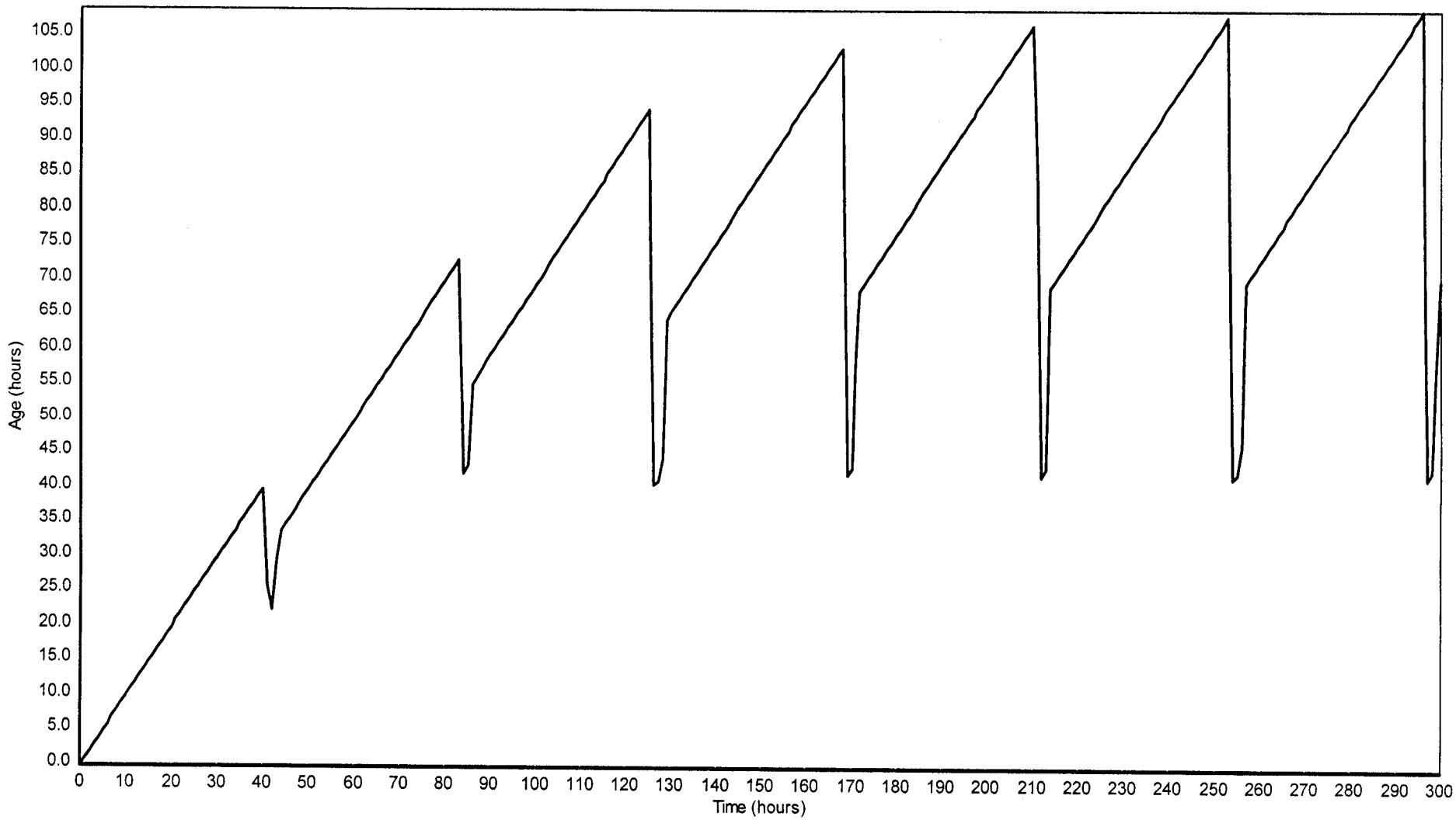

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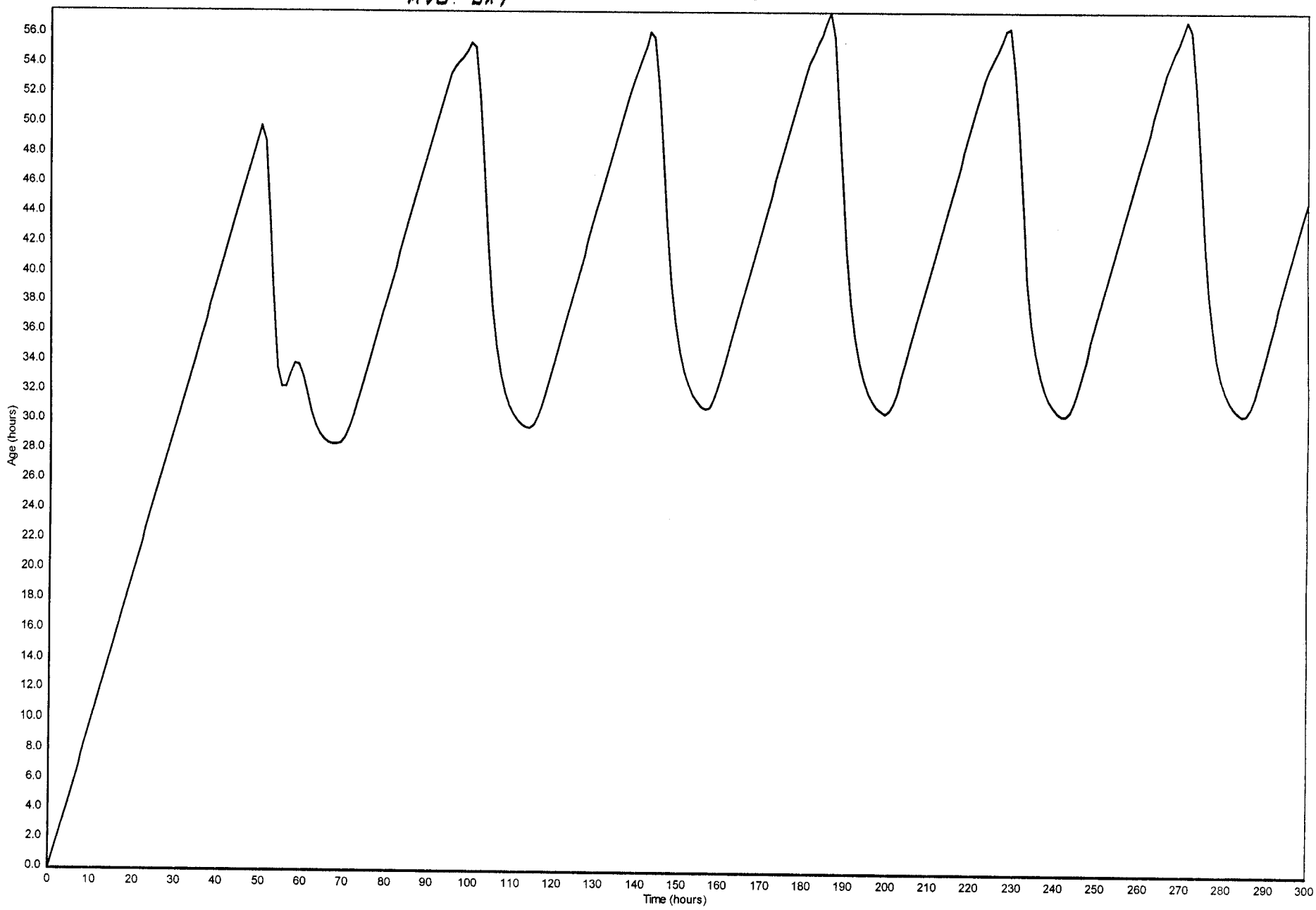

APPENDIX D

2013 CALIFORNIA FIRE CODE

CALIFORNIA FIRE CODE – MATRIX ADOPTION TABLE
APPENDIX B – FIRE-FLOW REQUIREMENTS FOR BUILDINGS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.
See Chapter 1 for state agency authority and building applications.)

Adopting Agency	BSC	SFM		HCD			DSA		OSHPD				BSCC	DHS	AGR	DWR	CEC	CA	SL	SLC
		T-24	T-19*	1	2	1/AC	AC	SS	1	2	3	4								
Adopt Entire Chapter																				
Adopt Entire Chapter as amended (amended sections listed below)		X																		
Adopt only those sections that are listed below																				
[California Code of Regulations, Title 19, Division 1]																				
Chapter / Section																				
B105.2		X																		

* The *California Code of Regulations* (CCR), Title 19, Division 1 provisions that are found in the *California Fire Code* are a reprint from the current CCR, Title 19, Division 1 text for the code user's convenience only. The scope, applicability and appeals procedures of CCR, Title 19, Division 1 remain the same.

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

SECTION B101
GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102
DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103
MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142 or the *California Wildland-Urban Interface Code*.

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by fire walls without openings, constructed in accordance with the *California Building Code*, are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings. The minimum fire-flow and flow duration requirements for one- and two-family

dwellings having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m^2) shall be 1,000 gallons per minute (3785.4 L/min) for 1 hour. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5m^2) shall not be less than that specified in Table B105.1.

Exception: A reduction in required fire-flow of 50 percent, as approved, is allowed when the building is equipped with an approved automatic sprinkler system.

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1.

Exceptions:

1. A reduction in required fire-flow of up to 75 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1.
2. *[SFM] Group B, S-2 and U occupancies having a floor area not exceeding 1,000 square feet, primarily constructed of noncombustible exterior walls with wood or steel roof framing, having a Class A roof assembly, with uses limited to the following or similar uses:*
   - *2.1. California State Parks buildings of an accessory nature (restrooms).*
   - *2.2. Safety roadside rest areas, (SRRA), public restrooms.*
   - *2.3. Truck inspection facilities, (TIF), CHP office space and vehicle inspection bays.*
   - *2.4. Sand/salt storage buildings, storage of sand and salt.*

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *California Building Code*.

b. Measured at 20 psi residual pressure.

SECTION B106
REFERENCED STANDARDS

>	ICC	IWUIC—12	California Wildland-Urban Interface Code	B103.3
	NFPA	1142—12	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3