Appendix F.

Questa Engineering Corporation

Domestic and Fire Flow Water Supply Evaluation

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Domestic and Fire Flow

Water Supply

for

Heritage Oaks Memoria Park
San Jose, California

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INTRODUCTION AND BACKGROUND

This report describes water supply plans to meet domestic water needs and fire suppression requirements for the proposed Heritage Oaks Memorial Park, located off Bailey Avenue at the southern end of the City of San Jose (**Figure 1**). It was prepared by Questa Engineering under a sub-contracting agreement with Clark & Green Associates. This is an update and follow-on to a prior report prepared by Questa Engineering in May 2014 titled "Water Supply Analysis for Heritage Oaks Memorial Park". The 2014 report provided an analysis of projected water needs, water supply options, impacts and mitigation measures related to domestic water uses, cemetery lawn irrigation, and fire suppression requirements. The current report addresses specifically the proposed plans for domestic water supply and fire suppression needs.

Briefly, the proposed plan to supply water for domestic uses and fire suppression is through extension of water service provided by Great Oaks Water Company from their existing water main at Santa Teresa Blvd and Laguna Avenue on the east side of the project site. This will entail: (a) installation of approximately 4,000 lineal feet of 8-inch water main on Laguna Avenue (by Great Oaks); (b) booster pump station with separate water meters for domestic water and fire flow to be located at the west end of Laguna Avenue (by Heritage Oaks); and (c) approximately 3,500 lineal feet of 8-inch water main along a dirt path and grassland from the Laguna Ave booster pump station to the proposed Heritage Oaks Administrative Building-Funeral Home location (by Heritage Oaks). The domestic and fire suppression water line is proposed to be installed parallel to a new 12-inch diameter recycled water line that will supply tertiary recycled water for irrigation of the Heritage Oaks cemetery lawns and the neighboring Cinnabar Hills Golf Course (see Civil Engineering plans for additional details).

PROJECT SITE CONDITIONS

The overall project site consists of approximately 275 acres of rolling hills located immediately south of Bailey Avenue, along either side of the watershed divide between Coyote Valley (to the east) and the watershed area tributary to Calero Reservoir on the west. Elevations range from about 300 feet (above mean sea level, msl) along the eastern boundary (edge of Coyote Valley), to about 700 feet msl along the highest parts of the ridgeline. The site has historically been used for cattle grazing.

Existing Water Facilities. Existing water facilities on the property include the following:

- **Watering Trough**. Current water uses on the property are limited to a stock watering trough, which is fed by non-urban sourced water provided by the adjacent Cinnabar Hills Golf Club.

- **Onsite Well**. A well was installed on the property in 2003 in anticipation of ultimately providing a source of potable water. The well, which is currently capped, is located near the center of project site, about 500 feet north and uphill of the proposed site for the administration building. It was installed, inspected, and tested in accordance with requirements of the Santa Clara County Department of Environmental Health (DEH) and the Santa Clara Valley Water District (Valley Water). The 24-hr pumping test

demonstrated a well yield of 31,680 gallons, or approximately 22 gallons per minute, with full drawdown recovery in 30 minutes at the conclusion of the test. The production capacity and water quality of this well is good. However, the radial thickness of the annular well seal does not meet the current standard (3-inch minimum) required for public (municipal) water systems, precluding the use of this well for the domestic supply needs of the project.

- **Cross Valley Pipeline.** The Cross Valley Pipeline is an underground water conveyance pipeline owned and operated by Santa Clara Valley Water District that runs through the western portion of the project site. The pipeline is used to transfer surface water from San Luis Reservoir (imported water) and Anderson Reservoir to Calero Reservoir and facilities downstream of Calero. The Cross Valley Pipeline also has turnouts that supply raw irrigation water to some users along the pipeline route.

Existing Public Water Systems. Although the project site is currently not served by a public (municipal) water system, there are four (4) existing public water systems with service area boundaries near, adjacent or overlapping portions of the project site. As listed and summarized below, these are: (1) City of San Jose Municipal; (2) Great Oaks Water Company; (3) Cinnabar Hills; (4) Calero County Park (**Figure 2**).

Table 1. Public Water Systems in Project Vicinity

Water System I.D.	Name	Type*	Population Served	Water Source	Distance from Project Site
CA4310020	San Jose Municipal	C	98,198	SWP	Adjacent
CA4310022	Great Oaks Water Company	C	110,200	GW	Adjacent
CA4300986	Cinnabar Hills	NTNC	500	SWP	0.25 miles
CA4300987	Calereo County Park	TNC	210	GW	Adjacent

*NTNC = Non-transient, Non-community; C = Community; NC = Non-community; T= Transient

DOMESTIC WATER SUPPLY

The 2014 Questa study evaluated domestic water supply needs for the Heritage Oaks Memorial Park and at that time estimated that: (a) the domestic water system would fall under the authority of the Santa Clara County DEH; and (b) the domestic water needs could be supplied by the onsite well installed in 2003. It has subsequently been determined that the domestic water for the project must be provided by a public water system regulated by the State Water Resources Control Board, Division of Drinking Water (DDW), requiring that all facilities and operations are full compliance with applicable State Drinking Water Regulations. Additionally, since 2014 there have been changes in State legislation that now require exhaustive efforts to seek water service or consolidation with other existing public water systems before the DDW can consider the approval of a new public water system.

Public Water Service

In compliance with the current State requirements, the four existing public water systems near the

project site were investigated as possible water service providers for the Memorial Park. Direct personal contact was made with three of the water systems (San Jose Municipal, Great Oaks and Cinnabar Hills) to determine their capability and interest in extending water service to the project. Calero County Park was not contacted, as it was not deemed viable because of its small size. Of the three public water systems contacted, Great Oaks Water Company was the only one responding positively, indicating that they had both the capacity and interest in extending water service to the project.[1] They identified the logical point of connection to their water system to be at the west end of Laguna Avenue, and indicated following:

- Extension of their water service boundaries would be a routine administrative process since the project site immediately borders their existing water system boundary.

- Their existing water system has ample surplus source capacity to meet the domestic demand and fire flow/suppression requirements for the project.

- Separate water meters for domestic supply (smaller) and fire flow (larger) are recommended from a cost standpoint.

- Great Oaks would assume responsibility and costs for the water line extension from their existing main at Santa Teresa to the west end of Laguna Ave.

- Heritage Oaks would be responsible for the installation and maintenance of a booster pump station at the end of Laguna and for the water line from the pump station to the point(s) of use at the proposed Memorial Park.

Water Demand

Potable water supply will be provided to the administration building-funeral home and maintenance facility for employees (office and grounds staff) as well as daily visitors to the park. Potable water needs are anticipated to include: (a) restroom sinks and toilets; (b) drinking water fountains; (c) employee lunchroom sink; and (d) other miscellaneous uses such as cleaning, water for plants and flowers, etc.

Projected water demand for the memorial park at build-out has been estimated based on the expected number of people at the site for different activities, including committal services, memorial services, general visitation, onsite employees (office and grounds staff) and construction workers. Information contained in the Traffic Study for Heritage Oaks Memorial Park (Hexagon Transportation Consultants, Inc., February 2014) provides estimates of the expected daily maximum number of vehicle trips to the Memorial Park for the various activities. These estimates (translated into number of people) were combined with applicable water use factors (i.e., gallons per day per person) to derive total daily water demand estimates for typical daily activities. The estimates are presented in **Table 2**. Projected peak day demand (termed "Maximum Day Demand") is estimated at double the typical total daily demand. Annual water demand totals at the bottom of the table are based on projection of the typical total day demand and presented in gallons

[1] Personal communication (12/13/24), Jared Ajlouny, Vice President of Operations, Great Oaks Water Company

and acre-feet per year. The following assumptions were used in the analysis:

- Typical total daily demand is assumed to include all activities at capacity, including one memorial service with an attendance of 120 people. This level of activity and associated water demand could occur routinely at build-out.

- Projected number of people visiting the site for committal services, memorial services and general visitation assumes an average of three (3) persons per vehicle.

- Estimated percentage of daily visitors using the restroom facilities is 50%.

- Estimated percentage of people using drinking water fountains is 100%.

- Portable toilets will be provided for construction crews and will not contribute to the demand for restroom-related water use.

- Maximum Day Demand (MDD), estimated at double the typical total daily demand, may occur on days having multiple (up to 3) memorial services at 120 people each, warmer temperatures and/or increased use of restroom facilities.

- Peak Hourly Demand (PHD), per State Water Works Standards, is estimated as 1.5 times the MMD, averaged over the typical daily hours of operation.

Table 2
Estimated Potable Water Demand at Build-out
Heritage Oaks Memorial Park

Usage Factor	Number of People	Assumed People Using Restroom Facilities	Unit Demand (gpd/person)	Projected Daily Water Demand (gpd)
Daily Visitors				
Committal Services	210	105	5	525
Memorial Services (1)	120	60	5	300
General Visitation	60	30	5	150
Employees*	15	15	15	225
Construction Workers	20	0**	0**	0
Drinking Water – All	425		1	425
10% Allowance for Miscellaneous Cleaning, Plants & Flower Watering				175
Total Daily Demand				**1,800**
Maximum Day Demand (MDD)				**3,600**
Peak Hourly Demand (PHD)* **				**675 gal**
Projected Annual Demand				**657,000 gal** **2.0 ac-ft/yr**

* Includes administrative office and grounds staff

** Assumes construction crews use portable toilets
*** PHD = 1.5 times MDD spread over normal hours of daily operation (e.g., 8 hours)

Water Distribution System

A combined domestic and fire flow distribution system will be provided, consisting of an 8-inch diameter main and hydrants and pumping systems having capacity to deliver domestic supply in the range of 40 to 60 psi, with minimum 20 psi residual pressure for fire flow during periods of Maximum Day Demand.

No Use of Onsite Water Well

As noted previously, the onsite water well installed in 2003 (currently capped) is not suitable for direct potable use and cannot be connected to or combined with the new domestic water supply for the project. It may remain inactive or potentially could be developed for selective irrigation uses. However, with an estimated yield of 22 gpm, it would provide only a small fraction of the total irrigation water needed for the cemetery lawns and landscaping.

FIRE FLOW REQUIREMENTS

An ample supply of water will be required for fire suppression purposes in connection with the crematorium building, administration-funeral home building, and maintenance facilities planned for the project. The specific requirements will be determined by the San Jose Fire Marshall based on the size of the buildings, uses and type of construction. To the extent that the any of the buildings hold any remains, by state law those it will need to be constructed of materials that are not combustible. This will be an additional factor used by the Fire Marshall in assessing the fire suppression water requirements for the project. **Table 3** presents the estimated minimum fire flow requirements based on proposed building plans. A reduction in standard fire flow requirements can be approved depending on the type of fire sprinkler systems incorporated into the buildings. However, it is not likely that a minimum flow less than 1,500 gpm would be accepted.

Table 3
Fire Flow Requirements
Heritage Memorial Park

Building	Occupancy Type	Construction Type[1]	Floor Area (sq ft)	Standard Fire Flow Requirements[1]	
				Flow Rate (gpm)	Duration[2] (hrs)
Crematorium Building	A-3	III-B	4,300	1,500	2
Funeral Home	A-3	III-B	5,627	1,500	2
Maintenance Building	U	II-B	5,192	1,500	2

[1] City of San Jose Municipal Code, Chapter 17, Part 13, Table B105.1(3) – San Jose Fire Flow and Hydrant Policy
[2] Although not proposed, if fire flow were to be supplied from storage, 2 hours duration at 1,500 gpd would equal 180,000 gallons of storage, plus the ability to refill within 8 hours.

The booster pump system and pipelines will be designed to deliver the required flow of 1,500 gpm at 20 psi (pounds per square inch) pressure assuming full flow and water pressure to the domestic

uses. Great Oaks Water Company has indicated the ability to supply the projected water demand and water flow required for the project, which will be further documented as part of the formal water service extension process.

SUMMARY

Based on the combined number of employees and daily visitors to the Memorial Park, domestic water service must be provided from a state-approved public water system. Great Oaks Water Company (CA4310022), whose service area boundaries currently border the property, has indicated willingness, ability, and capacity to provide water supply to the property for both domestic needs and fire flow requirements.

The proposed water service from Great Oaks will be via an extension from their existing water main at Santa Teresa Blvd and Laguna Avenue on the east side of the project site. This will entail the following:

(a) Great Oaks Main Extension - approximately 4,000 lineal feet of 8-inch water main on Laguna Avenue (by Great Oaks);

(b) Heritage Oaks-Laguna Ave Booster Pump Station - booster pump station with separate water meters for domestic water and fire flow to be located at the west end of Laguna Avenue (by Heritage Oaks); and

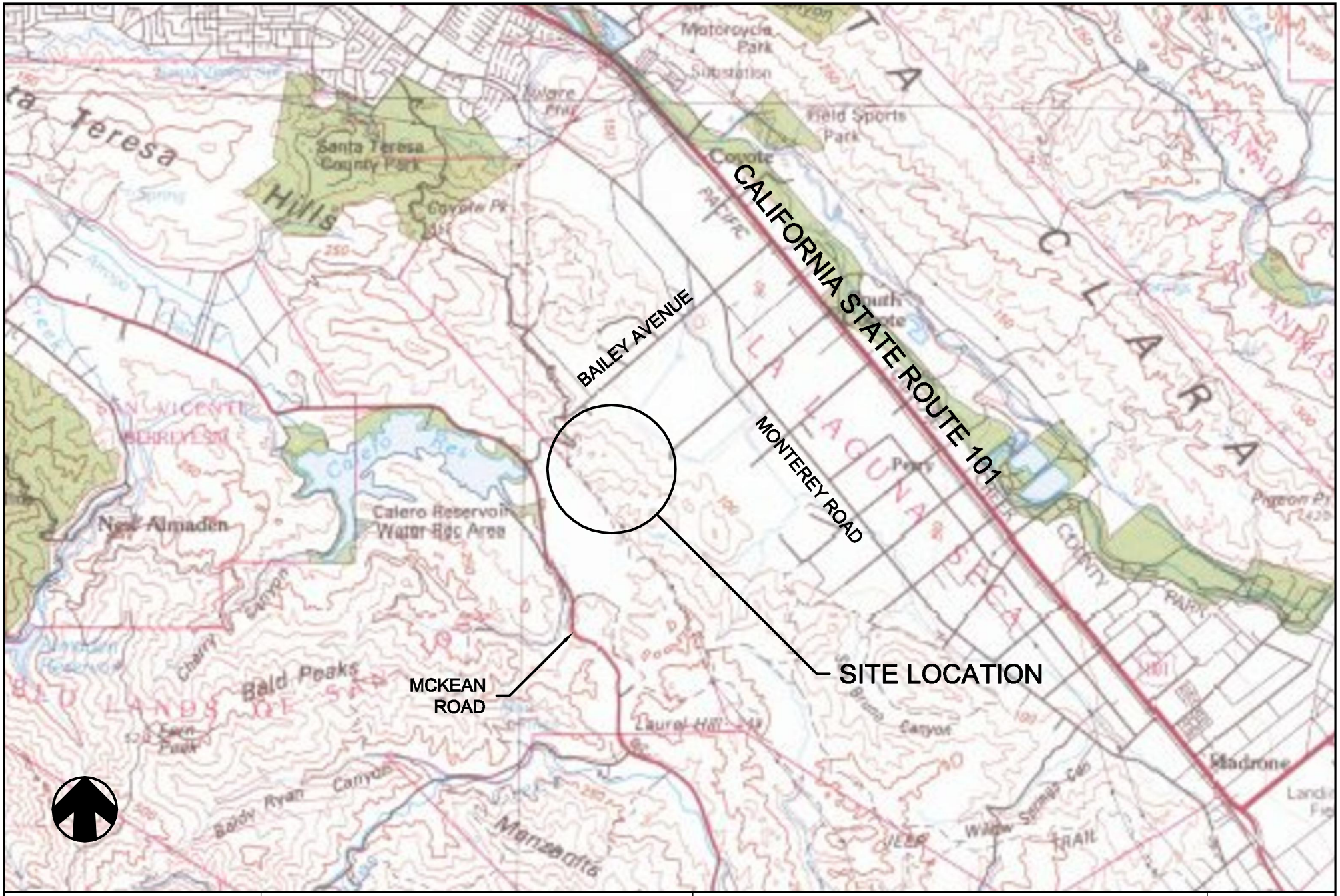
(c) Heritage Oaks Water Distribution Main - approximately 3,500 lineal feet of 8-inch water main along a dirt path and grassland from the Laguna Ave booster pump station to the proposed Heritage Oaks Administrative Building-Funeral Home location (by Heritage Oaks). The new water line is proposed to be installed parallel to a new 12-inch diameter recycled water line that will supply tertiary recycled water for irrigation of the Heritage Oaks cemetery lawns and the neighboring Cinnabar Hills Golf Course (see Civil Engineering plans for additional details).

Estimated domestic water needs for the Heritage Oaks Memorial Park at build-out are:

- Maximum Day Demand: 3,600 gpd
- Average Day Demand: 1,800 gpd
- Peak Hourly Demand: 675 gallons
- Average Annual Water Demand: 657,000 gallons (2.0 acre-feet per year)

Domestic-potable water will be provided to all buildings and facilities, including: (a) restroom sinks and toilets; (b) drinking water fountains; (c) employee lunchroom sink; and (d) other locations for miscellaneous uses such as cleaning and water for plants and flowers. Water will be supplied at a minimum pressure of 40 psi.

Water for fire suppression will be supplied to hydrants and buildings to meet a minimum fire flow as specified by the City of San Jose Fire Marshall, anticipated to be 1,500 gpm for 2-hour minimum duration at minimum 20 psi.



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LOCATION MAP

HERITAGE OAKS MEMORIAL PARK

WATER SUPPLY PLAN

FIGURE

1

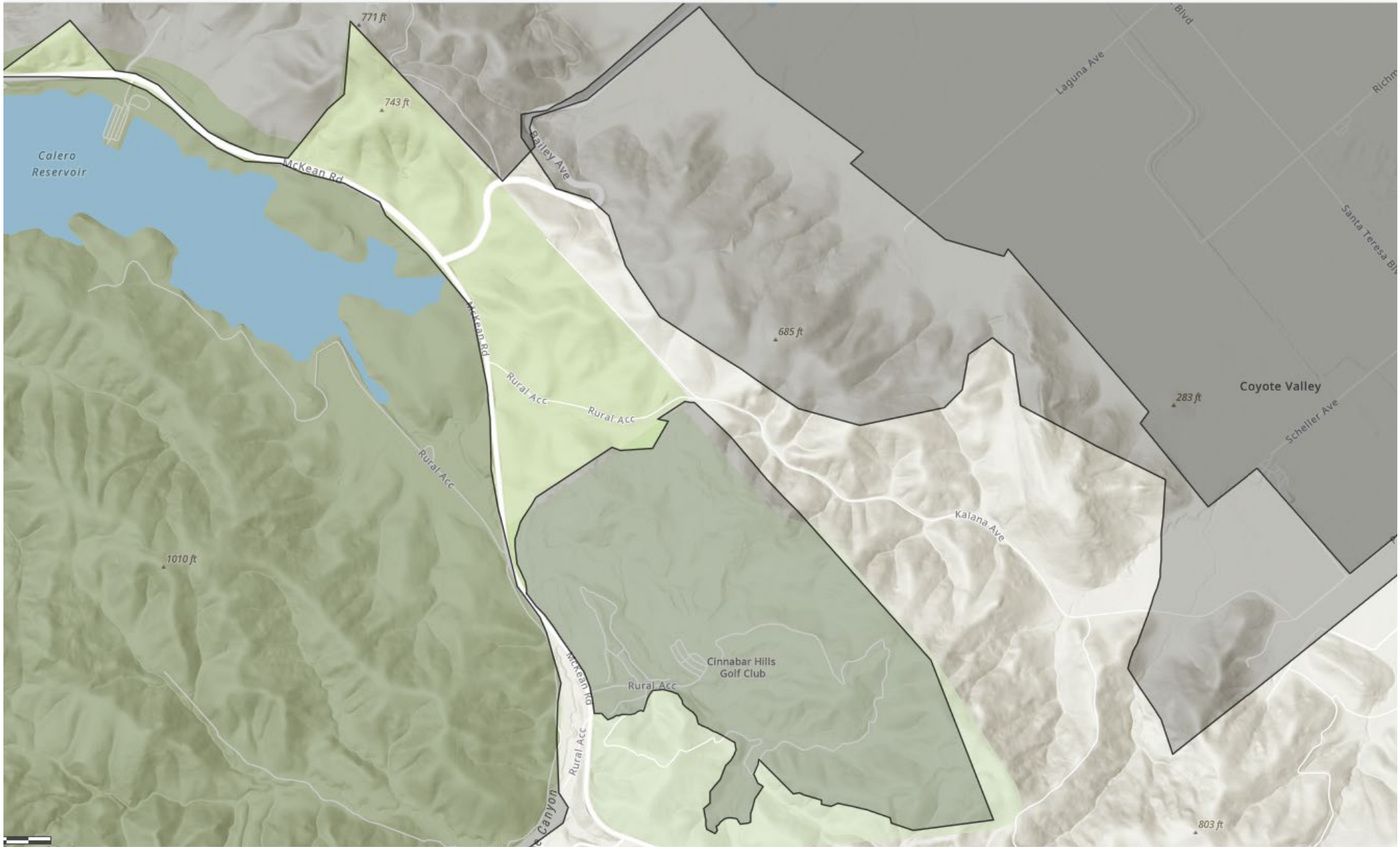

Figure 2. Public Water Systems in Project