CALAVERAS PUBLIC UTILITY DISTRICT
506 W. St. Charles, Street San Andreas, CA 95249

BOARD OF DIRECTORS MEETING: 3:00 PM
February 14, 2023

Richard Blood
President of the Board

Director Brady McCartney
Director Jack Tressler
Director J.W. Dell 'Orto
Director Steve McDermed

Calaveras Public Utility District hereby provides notice that it will convene its regularly scheduled public meetings of the Board of Directors at the District Office. Due to space limitations in the Board meeting room and in light of the continuing pandemic, we encourage the public to attend remotely as follows:

- **Join the Conference Call meeting**
- **Dial-in number (US): 1(669)900-9128**
- **Join the online ZOOM meeting:**
- **https://us02web.zoom.us/j/81691372893?pwd=azVkSFN3ZmJrU2V0aS85Vk92YThtZz09**
- **Meeting ID: 816 9137 2893**
- **Meeting Passcode code: 545381**

Please mute your call before joining. This will limit technical difficulties with audio. Only unmute your call if the President has requested public comment on an item. Upon completing your comments, please mute your call again. Do not put the call on hold, as hold music can ruin the call for all other participants. If that occurs, or in the event of disruptive conduct, staff reserves the right to disconnect that caller. Do no talk over the top of any other callers. Conversations must be one at a time.

AGENDA

1. **CALL THE MEETING TO ORDER**

2. **ROLL CALL OF DIRECTORS**
   a. President Richard Blood
   b. Director Brady McCartney
   c. Director J.W. Dell 'Orto
   d. Director Jack Tressler
   e. Director Steve McDermed

3. **PLEDGE OF ALLEGIANCE**

4. **PUBLIC COMMENT (Limit: 3 min/person)**
   At this time, members of the public may address the Board on any matter within its jurisdiction which is not on the agenda. The public is encouraged to work with staff to place items on the agenda for Board consideration. No action can be taken on matters not listed on the agenda. Comments are limited to 3 minutes per person.

5. **CONSENT ITEMS**
   Consent items should be considered together as one motion. Any item(s) requested to be removed will be considered after the motion to approve the Consent Items.

   a. Claim Summary

   Action: Roll call Vote
   Consider motion to approve consent item a.

ITEMS FOR BOARD DISCUSSION AND/OR ACTION

Board action may occur on any identified agenda item. Any member of the public may directly address the Board on any identified agenda item of interest, either before or during the Board's consideration of that item.

6. **EMPLOYEE RECOGNITION**
   Action Requested: Discussion
   a. Wyatt Rovera – 5 Years of Service

7. **PROP 218 WATER RATE STUDY**
   Action Requested: Discussion and Direction
   b. Presentation of Draft Water Rate Study
   c. Public Workshop on Water Rate Study
   d. Public Comment (3 min/per person)
   e. Director Comment and Direct Staff to schedule Townhall Meeting

9. **2022 WATER FEASIBILITY STUDY FINAL DRAFT**
   Action Requested: Discussion and Direction
   a. Present and Discuss Report Items
   b. Discuss and Direct General Manager to draft an RFP for Engineering Services for Planning/Construction Grants

10. **SELECTION OF ENGINEERING CONSULTANT TO COMPLETE A WATER MASTER PLAN, 5-YEAR CIP, AND 20-YEAR AMP AND REQUEST FOR APPROVAL OF RESOLUTION 2023-3**
    Action Requested: Roll Call Vote

a. Review proposal from Peterson Brustad Inc and Discuss recommendation from Staff and Directors who serve as a Temporary Advisory Committee who reviewed submitted proposals in response to the District's RFP.
b. Discuss Funding Source of Water Master Plan
c. Director questions for Peterson Brustad Inc.
d. Consideration of Approval of Engineering Services for a Water Master Plan with Peterson Brustad Inc., as recommended by the Temporary Advisory Committee.

11. **2022/2023 FISCAL YEAR BUDGET REVIEW**

Action Requested: Discussion

a. Mid-Year Budget Review (end of 2nd quarter)

12. **IWRM FUNDING AGREEMENT – UPDATE**

Action Requested: Discussion

a. Backwash Recycle Project
    i. Approved by UMRWA

13. **DISTRICT GRANTS**

Action Requested: Discussion

a. Discuss Approved and Pending Grants
b. Provide Update
    i. IRWM Grant
    ii. Water Feasibility Grant – Complete
    iii. Planning Grant
        1. Jeff Davis WTP
    iv. Construction Grant
        1. Rich Gulch

14. **REVIEW OF DISTRICT TEMPORARY ADVISORY (AD HOC) COMMITTEES AND ASSIGNMENTS**

Action Requested: No Action

a. The Board President shall dissolve existing Ad Hoc committees, consider the creation of the same or new committees and make assignments as needed.

15. **REPORTS**

The purpose of these reports is to provide information on projects, programs, staff actions, and committee meetings that are of general interest to the Board and public. No decisions are to be made on these issues.

a. Legal Counsel's Report
b. Water System Superintendent's Report

c. Engineer's Report
d. General Manager's Report
e. Director's Comments: Directors may make brief announcements or brief reports on their own activities. They may ask questions for clarification, make a referral to staff or take action to have staff place a matter of business on the future agenda.

16. **CLOSED SESSION**

PUBLIC EMPLOYEE PERFORMANCE EVALUATION (Government Code Section 54957)

Title: General Manager

17. **ADJOURNMENT**

If there is no other Board business the President will adjourn to its next regular meeting scheduled for March 14, 2023 at 3:00 p.m.

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Office at (209) 754-9442. Notification in advance of the meeting will enable CPUD to make reasonable arrangements to ensure accessibility to this meeting. Any documents that are made available to the Board before or at the meeting, not privileged or otherwise protected from disclosure, and related to agenda items, will be made available at CPUD for review by the public.

CALAVERAS PUBLIC UTILITY DISTRICT

CLAIM SUMMARY #____1-2023____

DATE:__ January 2023__

The claims listed on the schedules attached to this summary have been examined and found to be correct and proper demands against the Calaveras Public Utility District.

Claims Submitted	$ 215,058.82
Payroll Submitted	$ 45,864.21
Employee Reimbursement	$ 0.00
P/R Tax Deposits	$ 22,939.43
Sub-total	**$ 283,862.46**

Claim Summary Approved for	**$ 283,862.46**

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Clerk of the Board, Calaveras Public Utility District

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
A-1 Sharpening				
	01/09/2023	Repairs & Maintanance Auto	5532 · Repairs & Maintenance-Auto	1,040.10
	01/09/2023	Materials & Supplies	5548 · Materials & Supplies-T&D	124.28
	01/24/2023	Flat Repair	5532 · Repairs & Maintenance-Auto	25.00
Total A-1 Sharpening				1,189.38
ACWA-Health				
	01/09/2023	February Dental/Vision/Life	5220 · Dental/Vision/Life Insurance	1,671.75
Total ACWA-Health				1,671.75
Alpha Analytical Labs, Inc.				
	01/09/2023	Lab	5685 · Lab & Sampling	430.00
Total Alpha Analytical Labs, Inc.				430.00
American Fidelity Assurance				
	01/09/2023	Nov & Dec 2022	5275 · Employee Section 125 Plan	427.20
Total American Fidelity Assurance				427.20
American Fidelity Assurance Co.(Flex)				
	01/09/2023	Inv# 2136804	5275 · Employee Section 125 Plan	231.25
Total American Fidelity Assurance Co.(Flex)				231.25
AT & T				
	01/09/2023	Acct# 234 351-0095 839 7	5480 · Telephone	55.81
	01/09/2023	Acct# 209-286-1502	5480 · Telephone	247.88
	01/09/2023	Acct# 209-754-1920	5480 · Telephone	245.98
Total AT & T				549.67
AT &T				
	01/09/2023	Acct# 030 378 3224 001	5480 · Telephone	61.63
	01/24/2023	Hydro #3 Long Distance & WTP Long Distance	5480 · Telephone	69.85
Total AT &T				131.48
AT&T				
	01/24/2023	Shop Phone & Internet	5480 · Telephone	81.09
Total AT&T				81.09
Blood, Richard				
	01/24/2023	CPUD Regular Meeting 1/10/2023	5310 · Board Meetings-Director Fees	100.00
	01/24/2023	CPUD Regular Meeting 1/10/2023	5325 · Mileage Reimb, Parking, Tolls	0.00
Total Blood, Richard				100.00
Brawner Automotive Repair				
	01/09/2023	Vac Trailer Maintenance	5532 · Repairs & Maintenance-Auto	341.22
Total Brawner Automotive Repair				341.22

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
Cal-Waste				
	01/09/2023	Office	5760 · Sewer & Garbage	160.94
	01/09/2023	Shop	5760 · Sewer & Garbage	383.62
Total Cal-Waste				544.56
Cal PERS				
	01/25/2023	February Medical	5200 · Medical Benefits	33,530.10
	01/25/2023	Employer Contribution, Classic, 1017, CalPERS, 01/01/2023 - 01/14/2023	5230 · Retirement Benefits-CalPERS	3,282.66
	01/25/2023	Employer Contribution, PEPRA, 26507, CalPERS, 01/01/2023 - 01/14/2023	5230 · Retirement Benefits-CalPERS	2,059.96
Total Cal PERS				38,872.72
Calaveras Auto Supply				
	01/09/2023	T&D Materials & Supplies	5548 · Materials & Supplies-T&D	9.42
	01/09/2023	Hydro Materials & Supplies	5546 · Materials & Supplies-Hydros	76.46
	01/09/2023	Auto Repairs & Maintenance Vac Trailer	5532 · Repairs & Maintenance-Auto	51.45
Total Calaveras Auto Supply				137.33
Calaveras County Air Pollution Control				
	01/11/2023	Burn Permit 2023	5460 · Permits	12.00
Total Calaveras County Air Pollution Control				12.00
Calaveras Public Power Agency				
	01/24/2023	CPUD Warehouse	5743 · Electricity-Office	290.14
	01/24/2023	Glencoe Booster Pump	5741 · Electricity-Hydros	376.09
	01/24/2023	CPUD Office	5743 · Electricity-Office	154.57
	01/24/2023	Jeff Davis WTP	5742 · Electricity-Treatment	1,255.36
	01/24/2023	Licking Fork Pump Station	5740 · Electricity-T & D	1,994.80
Total Calaveras Public Power Agency				4,070.96
California Dept of Tax and Fee Admin				
	01/24/2023	7/1/2022 to 6/30/2023	5460 · Permits	524.72
Total California Dept of Tax and Fee Admin				524.72
California Special District Assoc.				
	01/24/2023	2023 Membership	5420 · Association Dues	8,186.00
Total California Special District Assoc.				8,186.00
Carbon Copy Inc.				
	01/09/2023	Copies	5464 · Printing	55.42
Total Carbon Copy Inc.				55.42
Care Free Lawns				
	01/24/2023	December Monthly Service	5670 · Janitorial	150.00
Total Care Free Lawns				150.00

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
Comcast				
	01/24/2023	Phone/Cable	5480 · Telephone	327.83
Total Comcast				327.83
Comcast Business (VE)				
	01/24/2023	Business Voice Edge	5480 · Telephone	299.82
Total Comcast Business (VE)				299.82
Condor Earth Technologies, Inc.				
	01/09/2023	Redhawk Dam	5695 · Consultants-Dam	1,249.78
Total Condor Earth Technologies, Inc.				1,249.78
ControlPoint Engineering				
	01/09/2023	CPUD Business Network Improvements	1114 · Buildings & Improvements	12,092.54
	01/09/2023	CPU Business Server Improvements	1114 · Buildings & Improvements	13,023.64
Total ControlPoint Engineering				25,116.18
Country Feed and More				
	01/24/2023	Materials & Supplies T&D	5548 · Materials & Supplies-T&D	21.99
Total Country Feed and More				21.99
CUSI				
	01/09/2023	UMS Interface - Neptune	5470 · Software Programs & Updates	1,000.00
Total CUSI				1,000.00
Datco Billing				
	01/24/2023	Quarter 1 Pre-employment fees	5665 · Pre-Employment	102.00
Total Datco Billing				102.00
De Lage Landen Financial Services Inc.				
	01/24/2023	Kyocera Printer	5464 · Printing	83.66
Total De Lage Landen Financial Services Inc.				83.66
Dell'Orto, J.W.				
	01/24/2023	CPUD Regular Meeting 1/10/2023	5310 · Board Meetings-Director Fees	100.00
	01/24/2023	CPUD Regular Meeting 1/10/2023	5325 · Mileage Reimb, Parking, Tolls	0.00
Total Dell'Orto, J.W.				100.00
Fischer, Merle				
	01/10/2023	January 2023	5210 · Medical Benefits-Retiree	996.31
Total Fischer, Merle				996.31
GEI Consultants, Inc.				
	01/24/2023	Chief Dam Safety Engineer Services	5695 · Consultants-Dam	1,688.50
Total GEI Consultants, Inc.				1,688.50
Gold Electric, Inc.				

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
	01/09/2023	Repairs to damaged lights	5536 · Repairs & Maintenance-T&D	1,411.43
Total Gold Electric, Inc.				1,411.43
Grainger				
	01/09/2023	WTP Materials & Supplies	5547 · Materials & Supplies-Treatment	398.31
Total Grainger				398.31
Henwood Associates, Inc.				
	01/09/2023	Hydro Repairs	5533 · Repairs & Maint-Dams & Hydros	898.73
Total Henwood Associates, Inc.				898.73
Herd's Machine Shop				
	01/09/2023	Labor to bore and tap valve handle	5536 · Repairs & Maintenance-T&D	360.00
Total Herd's Machine Shop				360.00
Hill Rivkins Brown & Associates				
	01/24/2023	December Legal Fees	5645 · Legal Services	2,625.50
Total Hill Rivkins Brown & Associates				2,625.50
Hobgood's Cleaning Service				
	01/24/2023	January Janitorial	5670 · Janitorial	160.00
Total Hobgood's Cleaning Service				160.00
Holt of California				
	01/09/2023	Backhoe Rental	5720 · Equipment Rental	5,378.46
	01/09/2023	Excavator Rental	5720 · Equipment Rental	4,569.40
	01/24/2023	Thumb Excavator Rental	5720 · Equipment Rental	4,498.26
Total Holt of California				14,446.12
Hunt & Sons Inc.				
	01/09/2023	Fuel for District Vehicles Inv# 906908 & 929699	5540 · Fuel	2,900.46
	01/24/2023	Fuel	5540 · Fuel	2,519.82
	01/24/2023	T&D Materials/Supplies	5548 · Materials & Supplies-T&D	330.99
Total Hunt & Sons Inc.				5,751.27
Lechowicz & Tseng				
	01/09/2023	12/1/2022 - 12/31/2022	5650 · Financial Consultants	1,897.75
Total Lechowicz & Tseng				1,897.75
Martin Marietta				
	01/09/2023	Aggregate - 3 loads Robinson Rd to MCV & 3 loads stock for shop	5548 · Materials & Supplies-T&D	916.90
Total Martin Marietta				916.90
Matrix Trust Company				
		Payroll Date 12/31	2317 · 457 Plan	827.39
		PR Date 1/14/2023	2317 · 457 Plan	806.94

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
Total Matrix Trust Company				1,634.33
McMurtry, Judy				
	01/25/2023	Refund of Credit Balance Acct# 1407	1371 · A/R Utility Service	291.50
Total McMurtry, Judy				291.50
Motherlode Answering Service				
	01/24/2023	January 2023	5606 · Answering Service	404.40
Total Motherlode Answering Service				404.40
Pace Supply				
	01/09/2023	Materials & Supplies T&D	5548 · Materials & Supplies-T&D	426.47
	01/09/2023	Materials & Supplies WTP	5547 · Materials & Supplies-Treatment	210.00
	01/09/2023	Credit	5548 · Materials & Supplies-T&D	-199.79
Total Pace Supply				436.68
PG&E - ENERGY STATEMENT				
	01/09/2023	Schaad's Res	5742 · Electricity-Treatment	221.51
	01/09/2023	Gold Strike Light	5743 · Electricity-Office	9.77
	01/09/2023	Gold Strike Light	5743 · Electricity-Office	9.77
	01/09/2023	District Office	5743 · Electricity-Office	289.07
	01/24/2023	MCV Hydro #2	5741 · Electricity-Hydros	88.67
	01/24/2023	Hydro #3	5741 · Electricity-Hydros	218.91
	01/24/2023	Hydro #1	5741 · Electricity-Hydros	173.39
Total PG&E - ENERGY STATEMENT				1,011.09
PGE-NON ENERGY INVOICES				
	01/24/2023	Schaad's Hydro	5741 · Electricity-Hydros	197.86
	01/24/2023	Hydro #1	5741 · Electricity-Hydros	7.75
	01/24/2023	Hydro #2	5741 · Electricity-Hydros	7.75
	01/24/2023	Hydro #3	5741 · Electricity-Hydros	7.75
Total PGE-NON ENERGY INVOICES				221.11
Pitney Bowes				
	01/09/2023	Postage	5462 · Postage	1,347.95
	01/24/2023	Postage	5462 · Postage	2,525.00
Total Pitney Bowes				3,872.95
Rexel				
	01/17/2023	PLC Controller for Jeff Davis WTP	5547 · Materials & Supplies-Treatment	3,269.43
Total Rexel				3,269.43
San Andreas Sanitary District				
	01/09/2023	Office	5760 · Sewer & Garbage	99.81

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
	01/09/2023	Shop	5760 · Sewer & Garbage	99.81
Total San Andreas Sanitary District				199.62
SEIU Local 1021				
	01/09/2023	PP End 12/31	2322 · SEIU Union Dues	461.81
	01/24/2023	PPE 1/14/2023	2322 · SEIU Union Dues	429.25
Total SEIU Local 1021				891.06
Sender's Market Inc.				
	01/09/2023	Materials & supplies T&D	5548 · Materials & Supplies-T&D	137.22
	01/09/2023	Auto Repairs & Maintenance Truck #2	5532 · Repairs & Maintenance-Auto	63.41
Total Sender's Market Inc.				200.63
Slate Geotechnical Consultants				
	01/09/2023	Middle Fork Dam Consulting	5695 · Consultants-Dam	15,420.00
	01/17/2023	FERC Part 12D Independent Consultants	5695 · Consultants-Dam	33,842.97
Total Slate Geotechnical Consultants				49,262.97
Staples Credit Plan				
	01/09/2023	Office Supplies	5475 · Office Supplies	290.89
Total Staples Credit Plan				290.89
Steve McDermed				
	01/24/2023	CPUD Regular Meetings 12/13/2022 & 1/10/2023	5310 · Board Meetings-Director Fees	200.00
Total Steve McDermed				200.00
SWRCB ACCOUNTING OFFICE				
	01/09/2023	Water System Annual Fee	5460 · Permits	6,010.02
Total SWRCB ACCOUNTING OFFICE				6,010.02
Treat's General Store				
	01/09/2023	Treatment Materials & Supplies	5547 · Materials & Supplies-Treatment	113.89
	01/09/2023	Office Supplies	5475 · Office Supplies	25.71
	01/09/2023	T&D Materials & Supplies	5548 · Materials & Supplies-T&D	121.16
	01/09/2023	Auto Repairs & Maintenance #007	5532 · Repairs & Maintenance-Auto	48.87
Total Treat's General Store				309.63
USA Blue Book				
	01/24/2023	Rain Pants & Rain Jackets	5548 · Materials & Supplies-T&D	286.39
Total USA Blue Book				286.39
Verizon Wireless				
	01/09/2023	District Employee/s Cell Phones	5480 · Telephone	968.79
	01/24/2023	Special Circuits	5480 · Telephone	62.12
Total Verizon Wireless				1,030.91

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
Volcano Telephone				
	01/09/2023	13900 Hwy 26	5480 · Telephone	53.27
	01/09/2023	1601 W Forty	5480 · Telephone	53.27
	01/09/2023	10727 Ponderosa Way	5480 · Telephone	53.27
	01/09/2023	3089 Ridge Rd	5480 · Telephone	49.70
	01/09/2023	Treatment Plant	5480 · Telephone	53.27
	01/09/2023	Special Circuit	5480 · Telephone	94.39
	01/09/2023	Schaad's Hydro	5480 · Telephone	53.27
	01/09/2023	Treatment Plant Broadband	5480 · Telephone	56.95
	01/09/2023	Schaad's Hydro	5480 · Telephone	66.70
	01/09/2023	Treatment Plant Long Distance	5480 · Telephone	69.95
Total Volcano Telephone				604.04
Weber, Ghio & Associates				
	01/24/2023	Phase II Construction Management	5850 · Engineering-Capital	19,381.27
	01/24/2023	Rich Gulch Replacement Project	5850 · Engineering-Capital	1,042.50
Total Weber, Ghio & Associates				20,423.77
Wells Fargo Bank - C. Bear				
	01/18/2023	Calaveras Mini Storage	5710 · Occupancy	400.00
	01/18/2023	Office Supplies	5475 · Office Supplies	1,094.42
	01/18/2023	Zoom, Quickbooks, BackBlaze, etc	5470 · Software Programs & Updates	827.80
	01/18/2023	Postage	5462 · Postage	1,286.68
	01/18/2023	Employee Recognition	5290 · Employee Recognition	8.54
	01/18/2023	Fees (To be reimbursed next billing cycle)	5610 · Bank Charges	68.65
	01/24/2023	Employee Recognition	5290 · Employee Recognition	56.00
	01/24/2023	Office Supplies	5475 · Office Supplies	177.97
	01/24/2023	Bank Charges	5610 · Bank Charges	31.39
	01/24/2023	Software Programs, etc	5470 · Software Programs & Updates	102.30
	01/24/2023	Materials & Supplies T&D	5548 · Materials & Supplies-T&D	829.71
Total Wells Fargo Bank - C. Bear				4,883.46
Wells Fargo Bank - M Roberts				
	01/18/2023	Annual Employee Dinner	5290 · Employee Recognition	894.10
	01/18/2023	Fees (To be reimbursed next billing cycle)	5610 · Bank Charges	44.65
	01/24/2023	Bank Fees	5610 · Bank Charges	14.01
Total Wells Fargo Bank - M Roberts				952.76
Wells Fargo Bank - T Small				
	01/18/2023	Clearwell Tank Project	5870 · Materials for Capital Projects	228.35
	01/18/2023	Quickbooks	5470 · Software Programs & Updates	65.00

Calaveras Public Utility District
Expenses by Vendor Detail
January 2023

Name	Date	Memo	Account	Amount
	01/18/2023	Training	5335 · Training	40.00
	01/18/2023	Fees (To be reimbursed next billing cycle)	5610 · Bank Charges	180.34
	01/24/2023	Repairs & Maintenance - Treatment	5535 · Repairs & Maintenance-Treatment	223.52
	01/24/2023	Software Programs	5470 · Software Programs & Updates	65.00
	01/24/2023	Bank Fees	5610 · Bank Charges	10.14
Total Wells Fargo Bank - T Small				812.35
				215,058.82

Water Rate Study
for the
Calaveras Public Utility District

Draft Report
February 6, 2023

LECHOWICZ + TSENG
MUNICIPAL CONSULTANTS

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Alameda, CA 94501
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SECTION 1: INTRODUCTION AND EXECUTIVE SUMMARY

1.1 Background

The Calaveras Public Utility District (CPUD or District) was established on January 19, 1934 as a public owned utility. The District is located approximately 60 miles southeast of Sacramento and provides water services to the communities of Railroad Flat, Glencoe, Paloma, Mokelumne Hill, and San Andreas, California. The District serves a population of roughly 6,350 people within its over 35 square mile area. The District's customer base includes both rural areas and the more densely populated areas of San Andreas and Mokelumne Hill which include residential customers, offices, schools, and businesses. The vast majority of customers receive treated water, though CPUD provides limited raw water service to four accounts in the Railroad Flat area. The District also generates hydroelectric power which can be sold to Pacific Gas & Electric at three small generating stations along the main transmission pipeline and a fourth at Schaads Reservoir.

The goal of this rate study is to determine a rate plan to cover the District's cost of service for the next five years. The cost of service includes operations, maintenance, capital improvements, and debt service. The last rate study was conducted in 2019, and rates were last increased July 1, 2022. Since the prior rate study, the District has issued new debt to finance the Clearwell Water Tank Replacement project which was not anticipated. An update to the rates is needed to ensure that the District can meet its debt coverage ratio in subsequent years. Without a rate increase, the District will fail to meet its coverage ratio due to insufficient operating revenues.

Additionally, this rate study is intended to update the current rate structure and bring rates more into alignment with American Water Works Association (AWWA) methodologies and recommendations. The District's current rate structure includes a base amount of water in the fixed monthly fee and higher levels of consumption are charged less per unit of water. Due to State water conservation requirements, this type of rate structure is no longer commonly used. This study proposes to simplify and update the District's rates.

1.2 Requirements of Proposition 218

The implementation of utility rates in California are governed by the substantive and procedural requirements of Proposition 218 the "Right to Vote on Taxes Act" which is codified as Articles XIIIC and XIIID of the California Constitution. The District must follow the procedural requirements of Proposition 218 for all utility rate increases. These requirements include:

1. **Noticing Requirement** – The District must mail a notice of the proposed rate increases to all affected property owners or ratepayers. The notice must specify the amount of the fee, the basis upon which it was calculated, the reason for the fee, and the date/time/location of a public rate hearing at which the proposed rates will be considered/adopted.

2. **Public Hearing** – The District must hold a public hearing prior to adopting the proposed rate

increases. The public hearing must be held not less than 45 days after the required notices are mailed.

3. **Rate Increases Subject to Majority Protest** – At the public hearing, the proposed rate increases are subject to majority protest. If more than 50% of affected property owners or ratepayers submit written protests against the proposed rate increases, the increases cannot be adopted.

Proposition 218 also established substantive requirements that apply to water rates and charges, including:

1. **Cost of Service** – Revenues derived from the fee or charge cannot exceed the funds required to provide the service. In essence, fees cannot exceed the "cost of service".

2. **Intended Purpose** – Revenues derived from the fee or charge can only be used for the purpose for which the fee was imposed.

3. **Proportional Cost Recovery** – The amount of the fee or charge levied on any customer shall not exceed the proportional cost of service attributable to that customer.

4. **Availability of Service** – No fee or charge may be imposed for a service unless that service is used by, or immediately available to, the owner of the property.

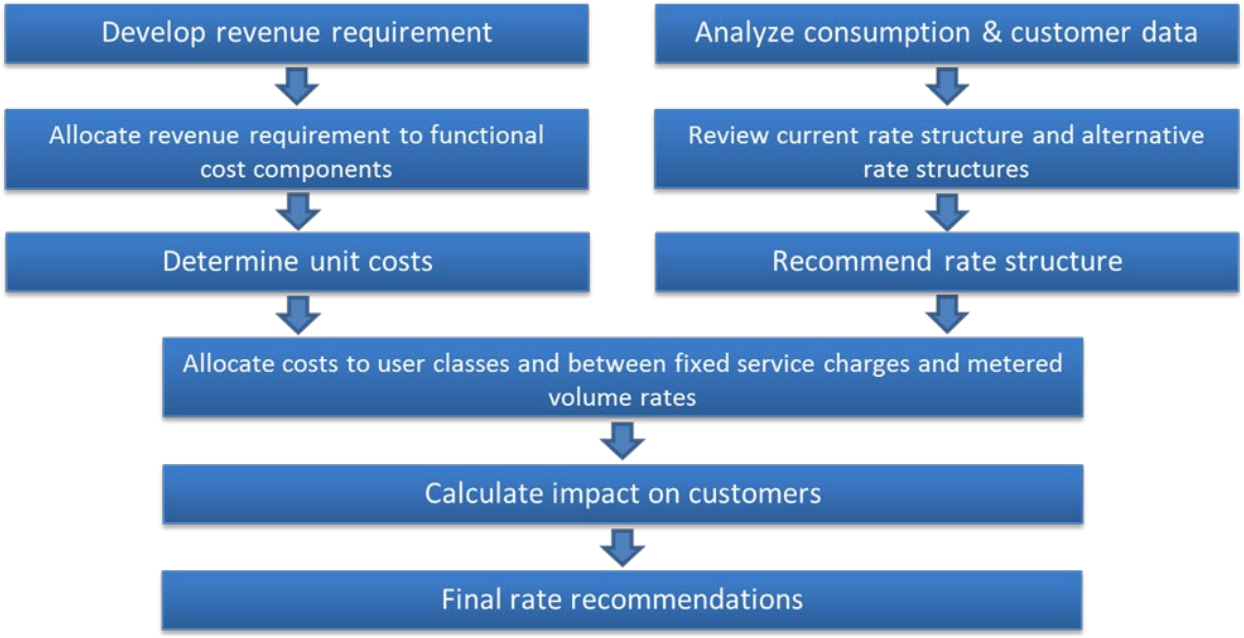
5. **General Government Services** – No fee or charge may be imposed for general governmental services where the service is available to the public at large.

Charges for water service are exempt from additional voting requirements of Proposition 218, provided the charges do not exceed the cost of providing service and are adopted pursuant to the procedural requirements of Proposition 218.

1.3 Rate Study Process

The American Water Works Association recommends that utilities set rates based on the actual cost of providing service and assign rates to customers based on how they use the system. A summary of the rate study process is provided in Figure 1.

Figure 1: Rate Study Process



The following is a brief description of the rate study process:

- **Revenue Requirement** – Revenue requirements are analyzed via a cash flow projection based on the best information currently available such as the District's historical operating results, budgets, and audits. The cash flow serves as a roadmap for funding future operating costs and capital expenditures while maintaining long-term fiscal stability.

- **Cost of Service Allocation** - The cost of service process builds on the revenue requirement analysis and assigns water costs to functional cost components: *metering and customer service*, *base demand,* and *extra demand*.

- **Rate Design** - Rate design involves developing a rate structure that fairly recovers costs from customers. Final rate recommendations are designed to fund the District's short- and long-term costs of providing service and fairly allocate costs to all customers and customer classes.

The rates developed in this report are based on the best available information gathered from District budgets, audits, and input from staff. The cost allocations proposed herein are based on American Water Works Association methodologies and industry standard practice. The proposed rates are based on the reasonable cost of providing service and are proportional to the benefits received by each customer.

1.4 Current and Proposed Water Rates

The District's current rate structure includes a fixed fee based on meter size and customer class that includes a base allotment of water plus volume rates for consumption over the base. The amount of water included in the base allotment varies with meter size such that larger meters are provided with more water in their base allotments. Water usage over the base is charged volume rates using a tiered structure. Multiple unit customers (including multi family and some commercial accounts) have a base allotment of 3,000 gallons per dwelling unit and can take advantage of the District's lower usage tier applicable to usage from 3,000 to 5,000 gallons per dwelling unit per month. The next tier covers usage from 5,001 to 20,000 gallons. This tier is applicable to multiple unit customers as well as 5/8" meter customers. 5/8" meter customers receive 5,000 gallons in their base allotment. The final tier encompasses usage above 20,000 gallons and is applicable to larger treated water customers and industrial customers. Agricultural customers are billed for usage above 60,000 gallons per month.

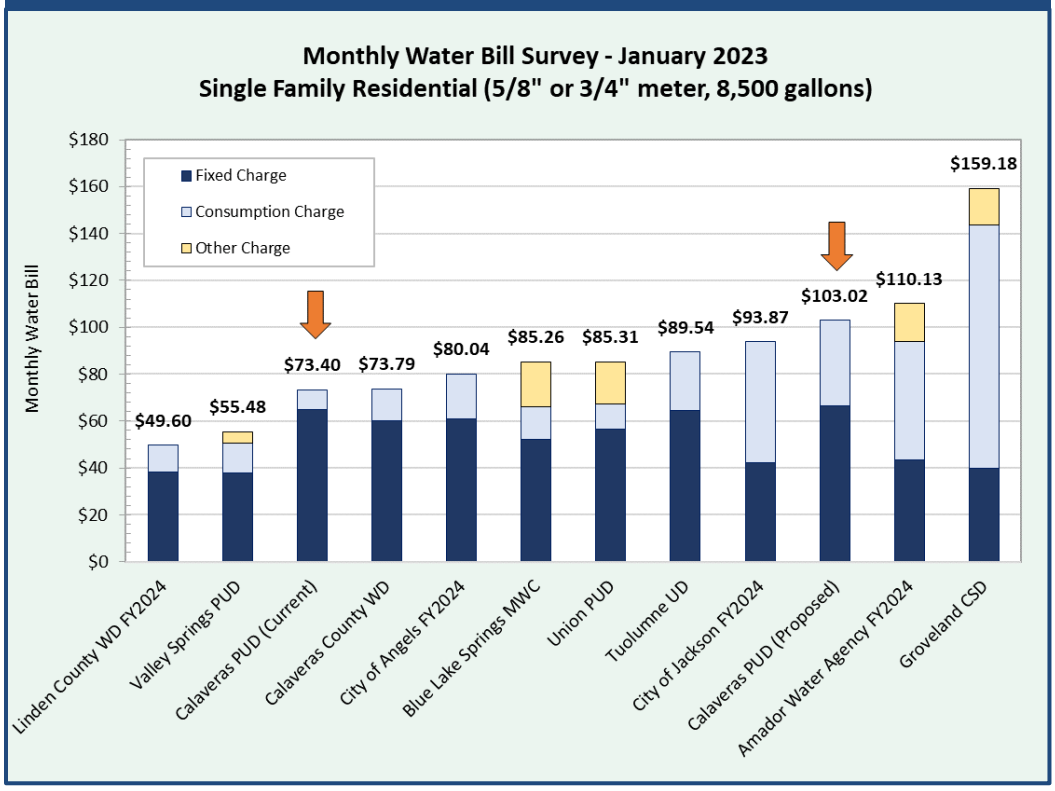
CPUD's water rates are proposed to be adjusted to cover the increased cost of service, simplify the rate categories, and better promote equity among customers. Current and proposed rates are provided in Table 1. It is proposed that new rates become effective July 1 of each year for the next five years. The base allotments are proposed to be eliminated such that the meter fees have no water usage included. The tiered rate structure is also eliminated. All treated usage is proposed to be charged a single rate and all untreated usage is also proposed to be charged a single rate for all levels of consumption. As shown, the proposed rate structure also includes drought rates that could be implemented during a water shortage emergency. The meter fees would remain the same, but the volume rates would increase.

Table 1: Executive Summary - Current and Proposed Water Rates
Calaveras Public Utility District
Water Rate Study

CURRENT			PROPOSED				
			July 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
		Usage Covered by Minimum (Gallons)					
BASE RATE			**BASE RATE**				
Meter Size			Meter Size - All customers; no water use is included in the base rate				
5/8" x 3/4"	$64.75	5,000	5/8" x 3/4"	$66.30	$75.58	$79.36	$83.33	$87.50
1"	$103.75	20,000	1"	$110.50	$125.97	$132.27	$138.88	$145.82
1-1/2"	$188.46	40,000	1-1/2"	$221.00	$251.94	$264.54	$277.77	$291.66
2"	$357.83	80,000	2"	$353.60	$403.10	$423.26	$444.42	$466.64
4"	$654.24	150,000	4"	$1,105.00	$1,259.70	$1,322.69	$1,388.82	$1,458.26
6"	$865.97	200,000	6"	$2,210.00	$2,519.40	$2,645.37	$2,777.64	$2,916.52
8"	$1,077.70	250,000	8"	$3,536.00	$4,031.04	$4,232.59	$4,444.22	$4,666.43
Residential and Commercial Multiple Units			**VOLUME RATES ($/thousand gallons applied to all use) - Normal Water Year**					
Usage 3,000 Gallons or less/month avg/unit	$38.68	3,000	Treated Water	$4.32	$4.92	$5.17	$5.43	$5.70
Agricultural	$273.14	60,000	Agricultural/Untreated	$3.48	$3.97	$4.17	$4.38	$4.60
Industrial	$865.97	200,000						
VOLUME RATES			**VOLUME RATES ($/thousand gallons applied to all use) - Drought Conditions**					
Treated Water	Use over Minimum		20% Cutback					
3,001 to 5,000 gallons	$1.24	$/hundred gal.	Treated water	$4.96	$5.65	$5.93	$6.23	$6.54
5,001 to 20,000 gallons	$2.47	$/thousand gal.	Agricultural water	$4.11	$4.69	$4.92	$5.17	$5.43
> 20,000 gallons	$2.21	$/thousand gal.	30% Cutback					
Agricultural			Treated water	$5.41	$6.17	$6.48	$6.80	$7.14
> 60,000 gallons	$1.70	$/thousand gal.	Agricultural water	$4.55	$5.19	$5.45	$5.72	$6.01
			40% Cutback					
			Treated water	$6.02	$6.86	$7.20	$7.56	$7.94
			Agricultural water	$5.15	$5.87	$6.16	$6.47	$6.79
DROUGHT MANAGEMENT PLAN SURCHARGE:			50% Cutback					
	Conservation		Treated water	$6.86	$7.82	$8.21	$8.62	$9.05
Water Supply Shortage	Level	Usage Surcharge	Agricultural water	$5.98	$6.82	$7.16	$7.52	$7.90
Stage 1	20%	11%						
Stage 2	40%	21%						
Stage 3	75%	41%						

A survey comparing CPUD's typical water bill with other local agency bills is provided in Figure 2. The typical single family customer in the District's service area uses 8,500 gallons of water per month and is served by a 5/8" meter. Under the current rates, the typical customer pays $73.40 per month which is at the low end of bills surveyed. Under the proposed rates, the typical customer's bill would increase to $103.02 per month which is at the higher end of bills surveyed.

Figure 2: Typical Bill Survey



SECTION 2: CUSTOMER BASE AND CURRENT RATE REVENUES

This section provides a description of the District's current rate structure, customer base, and rate revenues.

2.1 Current Rates

The District's current rate structure includes monthly base rates and usage (volume) rates. In addition, the District has a schedule of Drought Management Surcharges that can be implemented during water shortage emergencies.

2.1.1 Base Rate

All customers are charged a base rate that is dependent on their customer class (multiple unit, residential/commercial, agricultural, or industrial). Residential and commercial fixed charges are further subdivided based on meter size. The base rate for each customer includes a base allotment of water. The amount of water in the allotment varies based on customer class and meter size. All customers are charged the base fee regardless of water consumption; i.e. if a customer uses less than their allotted amount of water during the monthly billing period, they are still charged the full base rate. Untreated customers are only billed during months of the year when untreated water is available.

2.1.2 Usage Rate

In addition to the base rate, customers who exceed their water usage allotment pay a usage rate per thousand gallons of water consumption over the minimum. Multiple unit customers (including multi family and some commercial accounts) have a base allotment of 3,000 gallons per unit and have a lower usage tier applicable to usage from 3,000 to 5,000 gallons per dwelling unit per month. All other customers have base allotments of 5,000 gallons or greater and thus cannot utilize the lower tier. The next tier covers usage from 5,001 to 20,000 gallons. This tier is applicable to multiple unit customers as well as 5/8" meter customers. 5/8" meter customers receive 5,000 gallons in their base allotment. The final tier encompasses usage above 20,000 gallons and is applicable to larger treated water customers and industrial customers. Agricultural customers are billed for usage above 60,000 gallons per month.

2.1.3 Drought Management Surcharge

The Drought Management Surcharges can only be implemented after notification to the District's customers and after mandatory restriction declarations by the Board of Directors in accordance with District Resolution 2015-6. The Drought Management Surcharge is a percent increase levied upon water consumption that applies to the Usage Rates only. The surcharges are designed to recover revenue shortfalls in the event of a drought.

2.1.4 Rate Summary

A listing of the District's rates over the past four years is provided in Table 2. July 1, 2022, the District implemented increases to the base rates but did not increase the volume rates.

Table 2: Historic and Current Monthly Water Rates
Calaveras Public Utility District
Water Rate Study

Fiscal Year *Effective Date*	2019/20 *August 19, 2019*	2020/21 *July 1, 2020*	2021/22 *July 1, 2021*	2022/23 *July 1, 2022*	
BASE RATE					
Residential, Commercial, and Untreated					Usage Covered by Minimum (Gallons)
Meter Size					
5/8" x 3/4"	$55.68	$58.55	$61.57	$64.75	5,000
1"	$89.22	$93.81	$98.66	$103.75	20,000
1-1/2"	$162.05	$170.40	$179.19	$188.46	40,000
2"	$307.68	$323.54	$340.24	$357.83	80,000
4"	$562.56	$591.56	$622.09	$654.24	150,000
6"	$744.62	$783.00	$823.41	$865.97	200,000
8"	$926.68	$974.44	$1,024.74	$1,077.70	250,000
Residential and Commercial Multiple Units					
Usage 3,000 Gallons or less/month avg/unit	$33.26	$34.97	$36.77	$38.68	
Agricultural					
First 60,000 Gallons	$234.87	$246.97	$259.72	$273.14	
Industrial					
First 200,000 Gallons	$744.62	$783.00	$823.41	$865.97	
USAGE CHARGE - OVER MINIMUM					
Residential, Commercial, and Untreated					
5,001 to 20,000 gallons	$2.24	$2.35	$2.47	$2.47	$/1,000 gal
> 20,000 gallons	$2.00	$2.10	$2.21	$2.21	$/1,000 gal
Residential and Commercial Multiple Units					
Usage below 5,000 gallons that is not included in base rate	$1.12	$1.18	$1.24	$1.24	$/100 gal
5,001 to 20,000 gallons	$2.24	$2.35	$2.47	$2.47	$/1,000 gal
> 20,000 gallons	$2.00	$2.10	$2.21	$2.21	$/1,000 gal
Agricultural					
> 60,000 gallons	$1.54	$1.62	$1.70	$1.70	$/1,000 gal
Industrial					
> 200,000 gallons	$2.00	$2.10	$2.21	$2.21	$/1,000 gal
DROUGHT MANAGEMENT PLAN SURCHARGE:					
Water Supply Shortage	Conservation Level	Usage Surcharge			
Stage 1	20%	11%			
Stage 2	40%	21%			
Stage 3	75%	41%			

2.2 Typical Bills

Water service bill calculations for a typical customer based on current rates are provided in Table 3. Based on CPUD billing records, the typical single family residential customer uses 8,500 gallons per month and has a 5/8" meter. Given that the monthly base volume for customers with 5/8" meters is 5,000 gallons, the typical customer pays $73.40 each month. Typical winter water usage is 4,300 gallons which would not exceed the base allotment of 5,000 gallons. Thus, the average winter bill equals the base rate of $64.75. Typical summer usage is 14,500 gallons resulting in a monthly bill of $88.22.

Table 3: Typical Bills Under Current Rates
Calaveras Public Utility District
Water Rate Study

Average Bill – 8,500 gallons of usage				
	Fee		# of Units	Total Charges
Base Rate	$64.75	x	1	$64.75
Usage (thousand gallons)				
0 to 5 units	$0.00	x	5.0	$0.00
5 to 20 units	$2.47	x	3.5	$8.65
Total Monthly Bill				$73.40
Winter Bill – 4,300 gallons of usage				
	Fee		# of Units	Total Charges
Base Rate	$64.75	x	1	$64.75
Usage (thousand gallons)				
0 to 5 units	$0.00	x	4.3	$0.00
5 to 20 units	$2.47	x	0.0	$0.00
Total Monthly Bill				$64.75
Summer Bill – 14,500 gallons of usage				
	Fee		# of Units	Total Charges
Base Rate	$64.75	x	1	$64.75
Usage (thousand gallons)				
0 to 5 units	$0.00	x	5.0	$0.00
5 to 20 units	$2.47	x	9.5	$23.47
Total Monthly Bill				$88.22

2.3 Customer Base

The water utility has about 1,900 active accounts and 150 turned off accounts, as shown in Table 4. The 5/8" meter size makes up the majority of the District's customer base.

Table 4: Number of Accounts
Calaveras Public Utility District
Water Rate Study

Customer Class	No. of Accts	% of Total
Residential and Commercial		
Meter Size		
5/8" x 3/4"	1,677	81.1%
1"	180	8.7%
1-1/2"	12	0.6%
2"	31	1.5%
4"	6	0.3%
6"	0	0.0%
8"	1	0.0%
MU 40 Residential (1.5")	1	0.0%
Agricultural	1	0.0%
Untreated		
5/8" x 3/4"	3	0.1%
1"	1	0.0%
Fire Hydrant Meter	6	0.3%
Turned off Accounts	148	7.2%
TOTAL	**2,067**	100.0%

2.4 Service Charge Revenues

A summary of the District's service charge revenues over the past three fiscal years (FY) is provided in Table 5. Base rates have historically made up about 80% of service charge revenues with about 20% generated from usage charges.

Table 5: Water Service Revenue Summary
Calaveras Public Utility District
Water Rate Study

	FY2019/20	FY2020/21	FY2021/22	Three-Year Average
Base Rate	$1,637,453	$1,723,111	$1,811,935	
Usage Charges	$360,390	$438,908	$413,473	
Total Service Charges	$1,997,843	$2,162,019	$2,225,408	
Base Rate	82.0%	79.7%	81.4%	81.0%
Usage Charges	18.0%	20.3%	18.6%	19.0%
Total Water Sales	100.0%	100.0%	100.0%	100.0%

Estimated FY2022/23 service charge revenues are provided in Table 6. Base rates are projected to generate about $1.9 million in revenue (about 82%) and usage charges are projected to generate about $0.4 million (about 18%).

Table 6: Projected Service Charge Revenues FY2022/23
Calaveras Public Utility District
Water Rate Study

BASE RATE				
Residential and Commercial	**Base Rate**	**Count**	**Fixed Revenue**	**% of Total**
5/8" x 3/4"	$64.75	1,592	$1,236,984	53.3%
1"	$103.75	140	$174,300	7.5%
1-1/2"	$188.46	5	$11,308	0.5%
2"	$357.83	25	$107,349	4.6%
4"	$654.24	5	$39,254	1.7%
6"	$865.97	0	$0	0.0%
8"	$1,077.70	1	$12,932	0.6%
Residential and Commercial, Multiple Units	$38.68	686	$318,414	13.7%
Agricultural	$273.14	1	$3,278	0.1%
Untreated [1]				
5/8" x 3/4"	$64.75	3	$1,166	0.1%
1"	$103.75	1	$623	0.0%
Subtotal Fixed Revenue			$1,905,607	82.2%

USAGE CHARGE				
Residential and Commercial	**Usage Charge**	**Usage Above Base (gal)**	**Usage Charge Revenue**	**% of Total**
5,001 to 20,000 gallons	$2.47	60,548,947	$149,556	6.4%
> 20,000 gallons	$2.21	69,890,255	$154,457	6.7%
Residential and Commercial, Multiple Units				
Usage below 5,000 gallons that is not included in base rate *per 100 gallons	$1.24	6,068,121	$75,245	3.2%
5,001 to 20,000 gallons	$2.47	11,422,291	$28,213	1.2%
> 20,000 gallons	$2.21	1,350,706	$2,985	0.1%
Agricultural				
> 60,000 gallons	$1.70	791,200	$1,345	0.1%
Untreated				
5,001 to 20,000 gallons	$2.47	100,950	$249	0.0%
> 20,000 gallons	$2.21	643,640	$1,422	0.1%
Subtotal Consumption Revenue		150,816,110	$413,473	17.8%
Total Water Sales Revenue			**$2,319,080**	**100.0%**

1 - Untreated customers are only billed during portions of the year when untreated water is available. They are estimated to be charged 6 months out of the year.

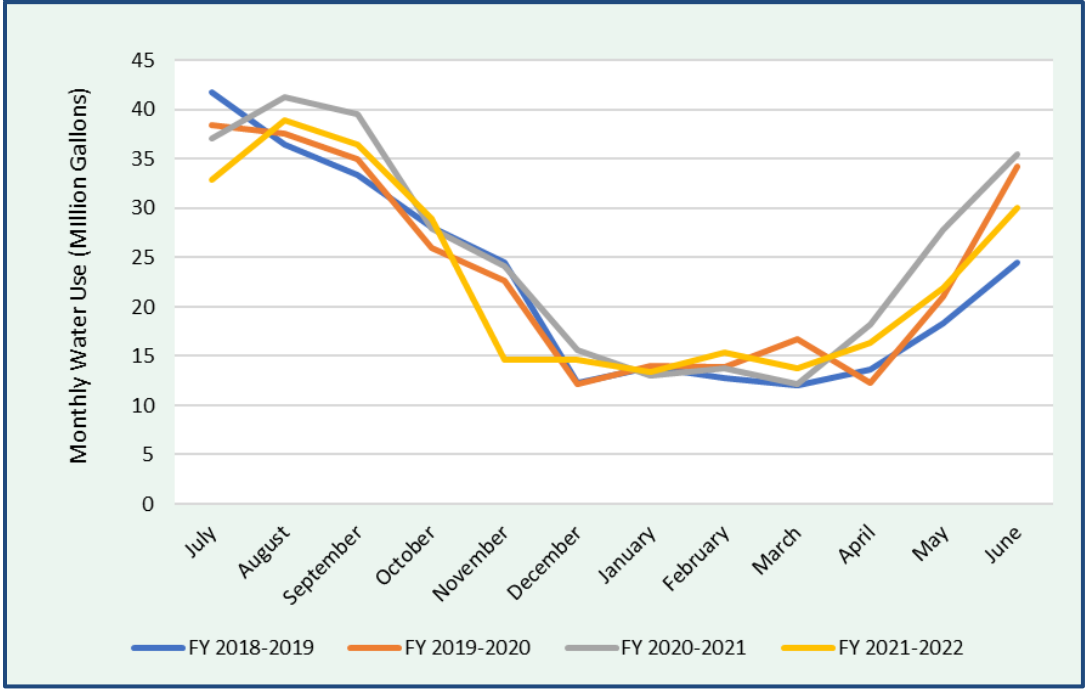
2.5 Water Usage Statistics

The District's water usage over the past three years is provided in Table 7 below. Residential and commercial customers are responsible for the largest share of water use, representing about 86.8% of total use over the past three years. About 46% of water use falls within the base water allotments and about 54% falls above the base water allotments and is billed the volume rates. Total water use over the past four years is illustrated in Figure 3. As shown, the District has high summer peak usage compared to winter usage.

Table 7: Water Consumption by Customer Class (Gallons)
Calaveras Public Utility District
Water Rate Study

Customer Class	2019/20	2020/21	2021/22	Three-Year Average	% of Total
Consumption Below Base					
Residential and Commercial	110,805,112	118,048,730	112,800,770	113,884,871	39.6%
Multiunit Residential	14,353,240	14,525,485	14,413,628	14,430,784	5.0%
Agricultural	609,300	540,100	509,600	553,000	0.2%
Untreated	182,220	160,690	58,980	133,963	0.0%
Fire Hydrant Meter	902,340	2,397,740	2,558,310	1,952,797	0.7%
Turned Off Accounts	1,376,150	340,849	1,652,362	1,123,120	0.4%
Subtotal Below Base	128,228,362	136,013,594	131,993,650	132,078,535	45.9%
Consumption Above Base					
Residential and Commercial	128,808,160	147,672,391	130,439,202	135,639,918	47.2%
Multiunit Residential	16,866,957	20,671,699	18,841,118	18,793,258	6.5%
Agricultural	469,900	739,600	791,200	666,900	0.2%
Untreated	53,440	140,470	744,590	312,833	0.1%
Fire Hydrant Meter	0	0	0	0	0.0%
Turned Off Accounts	0	0	2,642	881	0.0%
Subtotal Above Base	146,198,457	169,224,160	150,818,752	155,413,790	54.1%
TOTAL WATER CONSUMPTION	**274,426,819**	**305,237,754**	**282,812,402**	**287,492,325**	**100.0%**

Figure 3: Historical Districtwide Total Monthly Water Use



SECTION 3: COST OF SERVICE

Proposition 218 requires that utility rates be based on the reasonable cost of providing service to customers. This section provides an analysis of revenues and expenses to determine the total cost of service to be recovered via rates. The cost of service is expressed in a cash flow table that illustrates revenue increases needed to keep up with expenses and maintain the financial health of the enterprise.

3.1 Revenues

In FY2022/23, the District expects to collect about $2.6 million in total revenues, of which about 89% will be collected from water sales. Other revenue sources include fees, hydroelectric generation revenues, taxes, cell tower leases, and Mokelumne Hill Sanitation District (MHSD) revenue.

3.2 Expenses

3.2.1 Operating Costs

Major expenses include salaries, benefits, administration, operations, equipment, outside services, and utilities. Expenses are based on the District's forecast included in the FY2022/23 Budget, except for electricity expenses, which are increased by 35% in FY2022/23 per direction from the District. Salaries and benefit expenses are escalated according to the District's MOU dated September 2022.

3.2.2 Debt Service Costs

The District has one outstanding debt obligation – an installment purchase agreement issued in 2021 to finance the Clearwell Water Tank Replacement project. Annual debt service is about $133,000 per year and the obligation will be paid off in 2041. The amount financed was $2.035 million consisting of $2 million in debt proceeds and $35,000 in issuance costs. The loan agreement requires that the District maintain a debt service coverage ratio of 1.20. Debt coverage is calculated as:

(Revenue - Operating Expenses) / (Debt Service)

A debt service coverage ratio is a financial measure of an agency's ability to repay outstanding debt. Most forms of debt available to utilities, such as bonds, bank loans, and SRF loans, have legal requirements that obligate the borrower to maintain a debt coverage ratio typically ranging from 1.1 to 1.25. Essentially, this means that the borrower has a 10% to 25% financial buffer in excess of the debt payment amount. The 10% to 25% debt service buffer can be used to fund capital improvements or be added to reserves.

In FY2022/23, the District anticipates operating at a deficit meaning that it will need to use reserves to cover costs and it will not have sufficient operating revenues to meet its debt coverage requirement. Without a rate increase, the District will fail to meet its coverage ratio of 1.20 in subsequent years due to insufficient operating revenues. Thus, rates and fees must be set to meet this legal requirement. The

rates proposed in this report are projected to generate operating revenues needed to allow CPUD to meet and exceed its current debt coverage requirement.

3.2.3 Capital Costs

Table 8 provides the District's capital improvement plan for 2022/23. The majority of capital improvement spending will be toward the Clearwell Project. Additional capital costs include new equipment, meter reading software, office furniture, and transmission and distribution improvements. Capital improvement costs in FY2023/24 are projected at $100,000 and at $350,000 per year thereafter. These amounts are intended to cover repairs for wear and tear on the system and any unexpected or emergency expenses. To fund specific future projects, the District intends to secure grant funding so as to not burden the ratepayers.

Table 8: Capital Outlay Fiscal Year 2022/2023
Calaveras Public Utility District
Water Rate Study

Category	Budgeted
Water Treatment Improvements - Clearwell Project	
Environmental	16,536
Design (Eng., Geotech, Survey, SCADA/ELEC)	188,076
Phase 1 - Construction	16,300
Phase 2 - Construction	1,725,449
Phase 2 - SCADA Integration (TSI Inc)	125,100
Phase 2 - Construction Management	391,035
Phase 2 - 5% Unforeseen Contingency	47,834
Total Water Treatment Improvements	2,510,329
Equipment/Vehicles	
New Equipment: Backhoe Lease (5year option $2450/Month)	29,400
Auction Vehicles: F350 - Estimate $3500 Proceeds	(3,500)
Old Backhoe - Estimate $2500 Proceeds	(2,500)
Total Equipment/Vehicles	23,400
Software	
Meter Reading Software/Devices - Needs to be completed with CUSI	25,000
Total Software	25,000
Building Improvements	
Office Furniture	45,000
Business Server	
Board Room Improvements	10,000
Total Office Improvements	55,000
Water Distribution Improvements	
Rich Gulch Transmission Main Replacement - Design	38,293
Unforeseen Transmission and Distribution Projects	250,000
Total Water Distribution Improvements	300,000
Total Capital Overlay	**$2,913,729**

Source: Budget FY 2023

3.3 Reserves

The accumulation of reasonable reserves is another factor to consider when determining the cost of service. Utilities should maintain reserves to fund issues such as unexpected costs and emergency repairs, to provide cash flow in case of customer billing or revenue collection issues, and to provide financial stability in case of lower water sales due to drought. Fund reserves also allow the District to maintain its financial health and positive credit ratings, especially during emergencies.

The District maintains several reserve funds, including an Operating Reserve, Capital Reserve, Self-Insurance Reserve, Rate Stabilization Reserve, Vehicle Fleet Reserve, Equipment Reserve, Technology Reserve, and Designated Project/Special Use Reserve. As of July 2022, CPUD had $4.7 million in total available reserves. In FY2021/22, the District spent down some of its Capital, Equipment, and Designated Project/Special Use reserves to fund capital projects. In FY2022/23, the District anticipates spending down additional capital reserves and a portion of its Rate Stabilization Reserve.

A summary of the District's current reserve funds and fund targets are provided in Table 9. The District has an existing Reserve Policy adopted by the Board of Directors. In addition to establishing the fund targets provided in Table 9, this Policy outlines the specific purposes for which each reserve can be used. For instance, the Operating and Self-Insurance reserves can be used at any time to meet cash flow requirements. The Board typically authorizes use of the Capital Reserve for specific items in the Capital Improvement Plan during the budget process, though reserves can be used to fund unforeseen capital replacements if needed. The Rate Stabilization Reserve is used to supplement annual operating revenues if they are five percent or more below projected revenues. The Vehicle Fleet, Equipment, and Technology reserves are used exclusively for the purchase of vehicles, equipment, and computer hardware and software. Projects funded by the Designated Project/Special Use Reserve are evaluated on a case-by-case basis and approved by the Board.

Table 9 also includes proposed reserve fund targets and modifications. The Vehicle Fleet Reserve, Equipment Reserve, Technology Reserve, and Designated Project/Special Use Reserve are proposed to be eliminated and folded into the existing Capital Reserve. The Operating Reserve target is proposed to be increased by the cost of the District's annual debt payment.

The Rate Stabilization Reserve is proposed to be adjusted to better align with potential revenue shortfalls. The current Rate Stabilization Reserve target is set as one year's water consumption revenue. This is proposed to be reduced to 50% of water consumption revenue under the proposed rates. As customers conserve water, the District loses revenues. However, customers can only conserve so much and cannot lower their usage beyond a base level needed for health and sanitation. This base level is roughly equal to 50% of total annual consumption. It should be noted that although the Rate Stabilization policy target is adjusted from 100% of consumption revenues to 50%, the amount of the target in absolute dollars is increased. This occurs because the proposed rate schedule recovers a much larger portion of revenues through volume rates.

Table 9: Reserve Fund Recommendations
Calaveras Public Utility District
Water Rate Study

Reserve Category	Current	Proposed
Operating Reserve	6 months O&M	6 months O&M plus annual debt service cost
Capital Reserve	1 year's costs	1 year's costs; other options include accumulated depreciation and/or bridge funding to "float" the District's finances long enough to secure a loan for major projects
Self-Insurance Reserve	$200,000	$200,000 or annual OPEB obligation
Rate Stabilization Fund	1 year's water consumption revenue	50% of annual water consumption revenue (roughly equal to water use in excess of efficient, indoor use)
Vehicle Fleet Reserve	Accumulate $10,000 per year up to $50,000	Eliminate – include in capital reserve
Equipment Reserve	Accumulate $10,000 per year up to $100,000	Eliminate – include in capital reserve
Technology Reserve	Accumulate $4,000 per year up to $40,000	Eliminate – include in capital reserve
Designated Project/Special Use Reserve	Accumulate $20,000 per year up to $100,000	Eliminate – include in capital reserve

3.4 Water Cash Flow

Figure 4 and Table 10 provides the water fund cash flow projection for FY2022/23 to FY2027/28. The cash flow is based on the FY2022/23 Budget and includes revenue increases such that the District covers costs and rebuilds its reserves over the next five years.

In FY2022/23 the District is projected to end the year with an operating deficit meaning that operating expenses are greater than revenues and the District will need to use reserves to meet costs. Due to the deficit, the District is not expected to meet its debt coverage requirement. Moreover, due to large capital spending this fiscal year, the District's total reserve balance is projected to be drawn down to about $1.3 million. This is less than the target of 50% of operating costs (about $1.53 million in FY2022/23).

With the proposed rate increase in FY2023/24, the District's financial health is projected to improve significantly. The operating deficit is reversed, the District is projected to exceed its debt coverage requirement, and the District can fund $100,000 in capital improvements. With further proposed rates increases, capital funding is increased to $350,000 in future years, and the District rebuilds its reserves.

Figure 4: Cash Flows

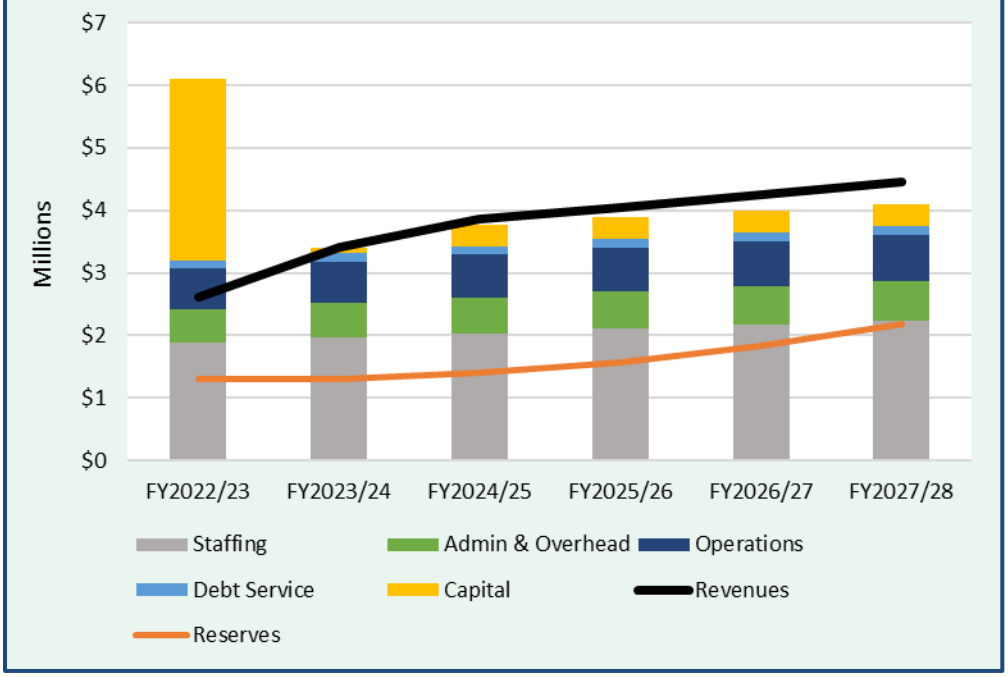


Table 10: Cash Flow Projection
Calaveras Public Utility District
Water Rate Study

	Budget	Years 1 -5: Proposition 218				
	2022/23	FY2023/24	FY2024/25	FY2025/26	FY2026/27	FY2027/28
Overall Revenue Adjustment		33.0%	14.0%	5.0%	5.0%	5.0%
Rate Increase Effective		Jul 1, 2023	Jul 1, 2024	Jul 1, 2025	Jul 1, 2026	Jul 1, 2027
BEGINNING FUND BALANCE [1]	$4,800,700	$1,300,800	$1,306,000	$1,399,200	$1,568,400	$1,828,600
REVENUES						
Water Service Charges	2,319,100	3,084,000	3,516,000	3,692,000	3,877,000	4,071,000
Fees	37,900	50,000	57,000	60,000	63,000	66,000
Hydro Revenue	76,400	102,000	116,000	122,000	128,000	134,000
Taxes	120,000	120,000	120,000	120,000	120,000	120,000
Interest (investments)	7,000	7,000	7,000	7,000	7,000	7,000
Cell Tower Leases	29,000	29,000	29,000	29,000	29,000	29,000
MHSD Revenue	18,200	18,200	18,200	18,200	18,200	18,200
Grant Revenue	0	0	0	0	0	0
Other Income	5,000	5,000	5,000	5,000	5,000	5,000
Total Revenue	2,612,600	3,415,200	3,868,200	4,053,200	4,247,200	4,450,200
EXPENSES						
Operational Expenses						
Salaries [2]	999,600	1,040,000	1,082,000	1,120,000	1,154,000	1,189,000
Benefits [2]	881,500	917,000	954,000	987,000	1,017,000	1,048,000
Conferences, Meetings, & Training	36,000	37,000	38,000	39,000	40,000	41,000
Administration Expenses	297,100	306,000	315,000	325,000	334,000	344,000
Operations Expense	313,300	323,000	332,000	342,000	353,000	364,000
Outside Services	206,100	212,000	219,000	225,000	232,000	239,000
Equipment Rent, Taxes, & Utilities	332,200	342,000	352,000	363,000	374,000	385,000
Subtotal O&M	3,065,800	3,177,000	3,292,000	3,401,000	3,504,000	3,610,000
Net Operating Revenue	(453,200)	238,200	576,200	652,200	743,200	840,200
Debt Service	133,000	133,000	133,000	133,000	133,000	133,000
Capital Projects	2,913,700	100,000	350,000	350,000	350,000	350,000
Total Expenses	6,112,500	3,410,000	3,775,000	3,884,000	3,987,000	4,093,000
Total Net Revenues	(3,499,900)	5,200	93,200	169,200	260,200	357,200
ENDING FUND BALANCE	1,300,800	1,306,000	1,399,200	1,568,400	1,828,600	2,185,800

	Budget	Years 1 -5: Proposition 218				
	2022/23	FY2023/24	FY2024/25	FY2025/26	FY2026/27	FY2027/28
Reserve Fund Targets [3]						
Operating Reserves	1,533,000	1,722,000	1,779,000	1,834,000	1,885,000	1,938,000
Capital Reserves	0	100,000	350,000	350,000	350,000	350,000
Self-Insurance Reserves	200,000	200,000	200,000	200,000	200,000	200,000
Rate Stabilization Reserve	547,000	610,000	695,000	730,000	766,000	805,000
Vehicle Fleet Reserve	10,000					
Equipment Reserve	10,000					
Technology Reserve	4,000					
Designated Project/Special Use Reserve	20,000					
Total Water Reserve Target	2,324,000	2,632,000	3,024,000	3,114,000	3,201,000	3,293,000
Total Reserve Target Met?	*no*	*no*	*no*	*no*	*no*	*no*
Debt Service Coverage Target - 1.20x [4]	-3.41	1.79	4.33	4.90	5.59	6.32
Target Met?	*no*	*yes*	*yes*	*yes*	*yes*	*yes*

1 - Source: Beginning Net Position from FY 2022-2023 Operational Budget

2 - Salaries and Benefits expenses are escalated according to the District's MOU dated September 2022 rather than the District's Operating Budget Forecast

3 - FY2022/23 shows the District's budgeted reserve targets; FY2023/24 and beyond show the proposed targets

4 - Net Operating Revenue divided by Total Debt Service

SECTION 4: RATE DESIGN

The prior section determined the total cost of providing service to customers. In this section, the cost of service is assigned to fixed and volume rates to fairly recover costs based on how customers use the system.

4.1 Rate Design Considerations

The proposed rate structure described in this report eliminates the water allotment included in the monthly fixed fees and eliminates tiered rates such that all water use is billed a uniform rate per unit. The goal of updating the water rate structure is to simplify the existing rate categories and promote equity among customers, particularly those that use lower volumes of water. Currently, the fixed fee per month includes a water allotment. For customers with a 5/8" meter, the base allotment is 5,000 gallons per month. However, the average customer only uses approximately 4,300 gallons per month during the winter months, meaning that the average customer is paying for water which they are not using throughout the winter. By eliminating the base allotment, customers would only pay for water they actually used and would have greater control over their bills. Additionally, per new State mandated water conservation regulations, non-billed water including water allotments may be subject to audits in the future.

Untreated water customers will continue to be billed the same fixed fees as treated water customers according to meter size. The untreated volume rate will continue to be calculated as the treated rate discounted for treatment expenses which do not apply to untreated (raw) water customers.

4.2 Cost Allocation Methodology

The American Water Works Association (AWWA) recommends methods to classify costs among various customers. The base-extra capacity method was selected for this study. Costs are allocated to the following categories: (a) base, (b) extra, and (c) metering and customer service. The base category is intended to encompass expenses related to providing water under average conditions ("base"). The extra category includes costs related to providing water above the system average (i.e. related to peak or "extra" usage). The metering and customer service category encompasses costs related to overhead, administration, meter repairs, debt services, and the annual capital improvement cost.

FY2023/24 was selected as the test year for cost allocation, see Table 11. The base and extra categories are combined into one category for cost allocation purposes and represent about 40% of total costs. The District intends to recover base and extra costs through uniform volume rates. This is in contrast to the District's current rate plan, which recovers slightly less than 20% of rate revenues from volume rates. As shown in Table 11, some of the base & extra category costs are noted as treatment expenses such as lab and sampling costs, treatment electric, chemicals, etc. These expenses will be excluded from the untreated water rate. The metering and customer service category makes up about 60% of total costs that will be recovered through base rates. The allocation percentages determined in Table 11 are

multiplied by the cost of service determined via the cash flow in Table 10 to calculate the total amount of revenue to be recovered from fixed and volume rates.

Table 11: Cost Allocation
Calaveras Public Utility District
Water Rate Study

Budgeted Expenses	Budget 2023/24	Base & Extra (usage rate)	Meters & Customer Service (meter fee)	Notes
Operating Expenses				
Salaries	1,040,000	33.33%	66.67%	33/67
Benefits	917,000	33.33%	66.67%	33/67
Conferences, Meetings, & Training	37,000	0.00%	100.00%	Meters and services
Administration Expenses	306,000	0.00%	100.00%	Meters and services
Operations Expense				
Treatment Expenses	189,666	100.00%	0.00%	Supply (Treatment)
Chemicals	14,600	100.00%	0.00%	Supply (Treatment)
Meter Repairs	32,445	0.00%	100.00%	Meters and services
All Other Operations Expense	86,288	100.00%	0.00%	Supply
Outside Services				
Lab & Sampling	9,666	100.00%	0.00%	Supply (Treatment)
Engineering & Dam Consultants	59,225	100.00%	0.00%	Supply
All Other Outside Services	143,109	0.00%	100.00%	Meters and services
Equipment Rent, Taxes, & Utilities				
Treatment Electric	22,801	100.00%	0.00%	Supply (Treatment)
Office Electric	5,587	0.00%	100.00%	Meters and services
All Other Expenses	313,612	100.00%	0.00%	Supply
Subtotal O&M	3,177,000	1,348,000	1,829,000	
Non-Operating Expenses				
Debt Service	133,000	0.00%	100.00%	Meters and services
Capital Projects	100,000	0.00%	100.00%	Meters and services
Subtotal Non-Operating	233,000	0	233,000	
Total Expenses (for Allocation)	3,410,000	1,348,000	2,062,000	
Proposed Cost Allocation %	**100.00%**	**39.54%**	**60.46%**	

4.3 Meter Equivalents

For the metering and customer service revenue requirement, AWWA guidelines recommend using meter equivalents to assign capacity-related costs to larger meter sizes. Utility infrastructure is typically designed to meet peak demands associated with the maximum flow rate of each meter. The flow of larger meters compared to the base meter size of 5/8" determines the meter equivalents, see Table 12.

Table 12: Number of Meter Equivalents
Calaveras Public Utility District
Water Rate Study

Meter Size	No. of Meters	Flow Rate (gpm)	Meter Ratio	No. of Meter Equivalents
5/8" x 3/4"	1,680	30	1.00	1,680
1"	181	50	1.67	302
1-1/2"	13	100	3.33	43
2"	31	160	5.33	165
4"	6	500	16.67	100
6"	0	1,000	33.33	0
8"	1	1,600	53.33	53
TOTAL [1]	**1,912**			**2,344**

gpm – gallons per minute
1 - Excludes turned off accounts and fire hydrant meters

4.4 Rate Calculation

CPUD's FY2023/24 rate calculation is provided in Table 13. The total cost to be recovered from the base & extra category from volume rates is $1.22 million based on the FY2023/24 revenue requirement of $3,084,000 multiplied by the allocation percentage of 39.54%. $237,000 is attributable to treatment expenses and about $983,000 is attributable to other supply costs. Treatment expenses are divided by estimated treated water consumption to calculate a rate of $0.84 per thousand gallons. All other supply costs are divided by total water consumption (treated and raw water usage) to calculate a rate of $3.48 per thousand gallons. The total treated water rate is $4.32 per thousand gallons which is made up of the treatment rate plus the supply rate.

The meters & customer service fee is calculated as the total FY2023/24 revenue requirement of $3,084,000 multiplied by the allocation percentage of 60.46% and divided by the number of meter equivalents. The cost per meter equivalent is $66.30. In Table 14, the cost per meter equivalent is multiplied by the number of equivalents for larger meters to determine the full schedule of monthly base rates. As described, no water use is proposed to be included in the base rate.

Table 13: FY2023/24 Rate Calculation
Calaveras Public Utility District
Water Rate Study

	Total	Base & Extra (usage rate)		Meters & Customer Service (Base Rate)
		Treatment Expenses	All Other Supply Expenses	
2023/24 Revenue Req.	$3,084,000	$236,733	$982,583	$1,864,684
Cost Allocation %	100.00%	7.68%	31.86%	60.46%
2023/24 Units of Service (estimated)		280,981	282,281	2,344
		Usage (thousand gallons)		# of Meter Equivalents
2023/24 Rate		$0.84	$3.48	$66.30
		$/thousand gal	$/ thousand gal	$/meter equivalent

Table 14: FY2023/24 Base Rates for Larger Meter Sizes
Calaveras Public Utility District
Water Rate Study

Meter Size	Ratio	Monthly Base Rate
5/8" x 3/4"	1.00	$66.30
1"	1.67	$110.50
1-1/2"	3.33	$221.00
2"	5.33	$353.60
4"	16.67	$1,105.00
6"	33.33	$2,210.00
8"	53.33	$3,536.00

4.5 Drought Rates

Table 15 provides the cost allocation for the base & extra category under various water cutback scenarios. The 0% column is the volume rate allocation under normal water year conditions (i.e. 0% cutback) and matches the allocation in Table 11. Columns noted as 20% to 50% represent potential water shortage scenarios. During drought conditions, water consumption will decrease and some of the District's expenses will also decrease proportionally. These expenses are highlighted grey in Table 15. Other expenses such as staffing, rental of equipment, and safety supplies for the operators will remain the same. The bottom row of Table 15 provides percentages which illustrate how supply related

expenses are expected to vary under the cutback scenarios. Under a 50% water cutback, non-treatment base & extra costs are expected to total about 85.9% of the normal water year costs.

Table 15: Base & Extra Cost Allocation Under Various Water Cutback Scenarios
Calaveras Public Utility District
Water Rate Study

Budgeted Expenses	Budget FY2023/24	Base & Extra Costs Under Water Cutback Scenarios				
		0%	20%	30%	40%	50%
Operating Expenses						
Salaries	1,040,000	346,667	346,667	346,667	346,667	346,667
Benefits	917,000	305,667	305,667	305,667	305,667	305,667
Conferences, Meetings, & Training	37,000	0	0	0	0	0
Administration Expenses	306,000	0	0	0	0	0
Operations Expense		0	0	0	0	0
Treatment Expenses	189,666	189,666	151,733	132,766	113,800	94,833
Chemicals	14,600	14,600	11,680	10,220	8,760	7,300
Meter Repairs	32,445	0	0	0	0	0
All Other Operations Expense	86,288	86,288	86,288	86,288	86,288	86,288
Outside Services	0	0	0	0	0	0
Lab & Sampling	9,666	9,666	9,666	9,666	9,666	9,666
Engineering & Dam Consultants	59,225	59,225	59,225	59,225	59,225	59,225
All Other Outside Services	143,109	0	0	0	0	0
Equipment Rent, Taxes, & Utilities		0	0	0	0	0
Treatment Electric	22,801	22,801	18,241	15,961	13,681	11,400
Office Electric	5,587	0	0	0	0	0
All Other Expenses	313,612	313,612	250,889	219,528	188,167	156,806
Subtotal O&M	3,177,000	1,348,192	1,240,056	1,185,988	1,131,920	1,077,852
Non-Operating Expenses						
Debt Service	133,000	0	0	0	0	0
Capital Projects	100,000	0	0	0	0	0
Subtotal Non-Operating	233,000	0	0	0	0	0
Total Expenses	3,410,000	1,348,192	1,240,056	1,185,988	1,131,920	1,077,852
Treatment Expenses		236,733	191,320	168,613	145,906	123,199
All Other Supply Expenses		1,111,458	1,048,736	1,017,375	986,014	954,653
Ratio of All Other Supply Expenses relative to Normal Water Year			94.36%	91.54%	88.71%	85.89%

Table 16 provides drought rate calculations. Treatment expenses under each cutback scenario are divided by treated water usage. For all other supply costs, the ratios shown at the bottom of Table 15 are multiplied by the supply revenue requirement shown in Table 13 ($983,000). This determines the revenue requirement which is then divided by estimated total usage.

Table 16: FY2023/24 Drought Rates
Calaveras Public Utility District
Water Rate Study

Category	Treatment Expenses	All Other Supply Expenses	Total
20% Water Cutback			
Revenue Requirement	$191,320	$927,121	$1,118,440
Units of Service (thousand gal)	224,784	225,825	
Unit Cost ($/thousand gal)	$0.85	$4.11	$4.96
30% Water Cutback			
Revenue Requirement	$168,613	$899,396	$1,068,009
Units of Service (thousand gal)	196,686	197,597	
Unit Cost ($/thousand gal)	$0.86	$4.55	$5.41
40% Water Cutback			
Revenue Requirement	$145,906	$871,672	$1,017,578
Units of Service (thousand gal)	168,588	169,369	
Unit Cost ($/thousand gal)	$0.87	$5.15	$6.02
50% Water Cutback			
Revenue Requirement	$123,199	$843,948	$967,147
Units of Service (thousand gal)	140,490	141,141	
Unit Cost ($/thousand gal)	$0.88	$5.98	$6.86

4.6 Proposed 5-Year Rate Plan

The District's 5-year rate plan is provided in Table 17. The rates are proposed to be effective July 1 of each year beginning in 2023 to correspond to the District's fiscal year. The FY2023/24 rates are calculated in the preceding tables. Rates for FY2024/25 and beyond are calculated as the FY2023/24 rates increased by the percents shown in the cash flow in Table 10. FY2024/25 rates are increased by 14% and the rates for FY2025/26 through FY2027/28 are increased by 5% annually.

Table 17: Current and Proposed Water Rates
Calaveras Public Utility District
Water Rate Study

CURRENT			PROPOSED				
			July 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
BASE RATE		Usage Covered by Minimum (Gallons)	**BASE RATE**				
Meter Size			Meter Size - All customers; no water use is included in the base rate				
5/8" x 3/4"	$64.75	5,000	5/8" x 3/4"	$66.30	$75.58	$79.36	$83.33	$87.50
1"	$103.75	20,000	1"	$110.50	$125.97	$132.27	$138.88	$145.82
1-1/2"	$188.46	40,000	1-1/2"	$221.00	$251.94	$264.54	$277.77	$291.66
2"	$357.83	80,000	2"	$353.60	$403.10	$423.26	$444.42	$466.64
4"	$654.24	150,000	4"	$1,105.00	$1,259.70	$1,322.69	$1,388.82	$1,458.26
6"	$865.97	200,000	6"	$2,210.00	$2,519.40	$2,645.37	$2,777.64	$2,916.52
8"	$1,077.70	250,000	8"	$3,536.00	$4,031.04	$4,232.59	$4,444.22	$4,666.43
Residential and Commercial Multiple Units			**VOLUME RATES ($/thousand gallons applied to all use) - Normal Water Year**					
Usage 3,000 Gallons or less/month avg/unit	$38.68	3,000	Treated Water	$4.32	$4.92	$5.17	$5.43	$5.70
Agricultural	$273.14	60,000	Agricultural/Untreated	$3.48	$3.97	$4.17	$4.38	$4.60
Industrial	$865.97	200,000						
VOLUME RATES			**VOLUME RATES ($/thousand gallons applied to all use) - Drought Conditions**					
Treated Water	Use over Minimum		20% Cutback					
3,001 to 5,000 gallons	$1.24	$/hundred gal.	Treated water	$4.96	$5.65	$5.93	$6.23	$6.54
5,001 to 20,000 gallons	$2.47	$/thousand gal.	Agricultural water	$4.11	$4.69	$4.92	$5.17	$5.43
> 20,000 gallons	$2.21	$/thousand gal.	30% Cutback					
Agricultural			Treated water	$5.41	$6.17	$6.48	$6.80	$7.14
> 60,000 gallons	$1.70	$/thousand gal.	Agricultural water	$4.55	$5.19	$5.45	$5.72	$6.01
			40% Cutback					
			Treated water	$6.02	$6.86	$7.20	$7.56	$7.94
			Agricultural water	$5.15	$5.87	$6.16	$6.47	$6.79
			50% Cutback					
			Treated water	$6.86	$7.82	$8.21	$8.62	$9.05
			Agricultural water	$5.98	$6.82	$7.16	$7.52	$7.90

DROUGHT MANAGEMENT PLAN SURCHARGE:

Water Supply Shortage	Conservation Level	Usage Surcharge
Stage 1	20%	11%
Stage 2	40%	21%
Stage 3	75%	41%

4.7 Bill Impacts

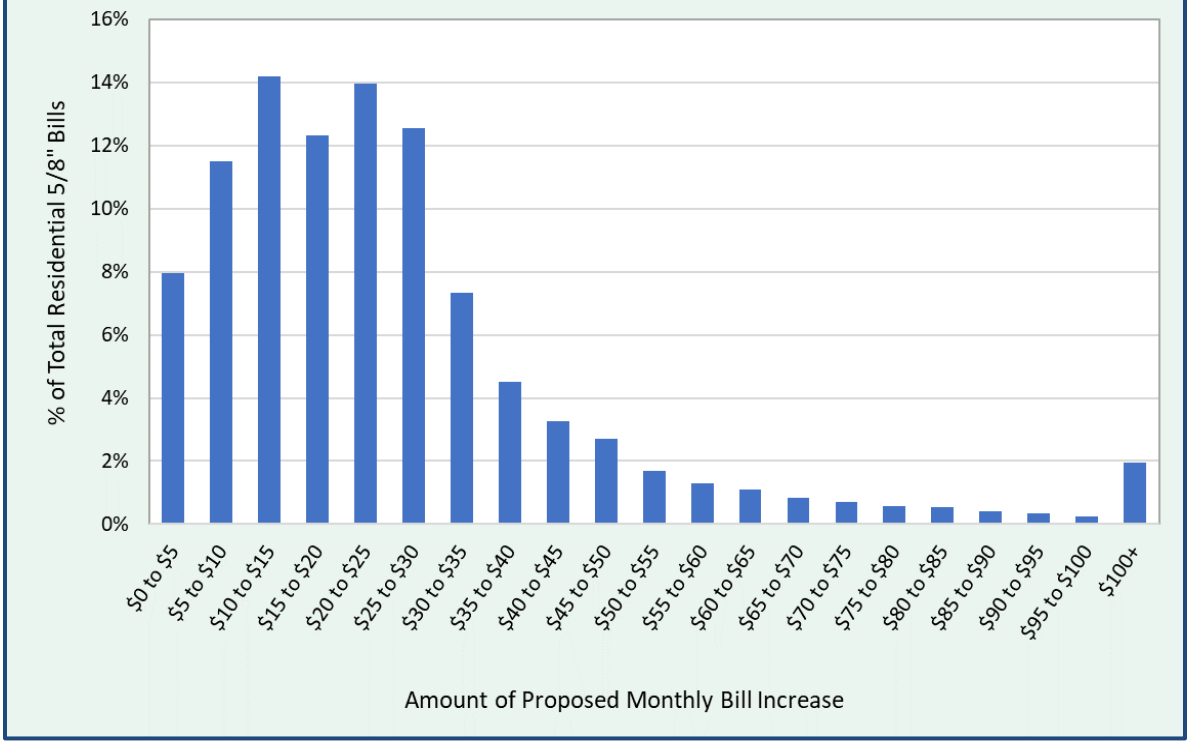
Table 18 provides impacts to a typical customer's bill based on average monthly usage, winter usage, and summer usage under the proposed rates. The typical summer bill is proposed to increase to a greater extent than the typical winter bill which reflects a higher percent of District revenue recovered through volume rates.

Table 18: Comparison of Current and Proposed Single Family Residential Bills
Calaveras Public Utility District
Water Rate Study

Average Bill	**Current**				**Proposed**				
	Fee		# of Units	Total Charges		Fee		# of Units	Total Charges	% Increase
Base Rate	$64.75	x	1	$64.75	Base Rate	$66.30	x	1	$66.30	
Usage (thousand gallons)					Usage	$4.32	x	8.5	$36.72	
0 to 5 units	$0.00	x	5	$0.00	(all use)					
5 to 20 units	$2.47	x	3.5	$8.65						
Total Monthly Bill				$73.40	Total Monthly Bill				$103.02	40%
Winter Bill	**Current**				**Proposed**				
	Fee		# of Units	Total Charges		Fee		# of Units	Total Charges	% Increase
Base Rate	$64.75	x	1	$64.75	Base Rate	$66.30	x	1	$66.30	
Usage (thousand gallons)					Usage	$4.32	x	4.3	$18.58	
0 to 5 units	$0.00	x	4.3	$0.00	(all use)					
5 to 20 units	$2.47	x	0	$0.00						
Total Monthly Bill				$64.75	Total Monthly Bill				$84.88	31%
Summer Bill	**Current**				**Proposed**				
	Fee		# of Units	Total Charges		Fee		# of Units	Total Charges	% Increase
Base Rate	$64.75	x	1	$64.75	Base Rate	$66.30	x	1	$66.30	
Usage (thousand gallons)					Usage	$4.32	x	14.5	$62.64	
0 to 5 units	$0.00	x	5	$0.00	(all use)					
5 to 20 units	$2.47	x	9.5	$23.47						
Total Monthly Bill				$88.22	Total Monthly Bill				$128.94	46%

Figure 5 provides the distribution of bill impacts under the proposed rates for single family customers served on 5/8” meters. About 1/3 of monthly bills will receive increases of $15 or less.

Figure 5: Bill Impact Analysis for Single Family Customers with 5/8” Meters



Calaveras Public Utility District

Distribution System Feasibility Study

Safe and Affordable Funding for Equity and Resilience Program

December 2022

Prepared by:

California Rural Water Association

California
Rural Water Association

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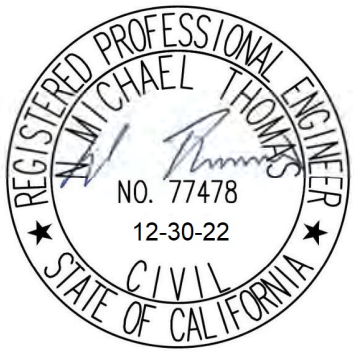
TABLES:

FIGURES:

APPENDICES:



1.0 INTRODUCTION

California Rural Water Association (CRWA) is providing technical assistance to the Calaveras Public Utility District (CPUD) under the State Water Resources Control Board (SWRCB) Safe and Affordable Funding for Equity and Resilience (SAFER) Program. This Distribution Feasibility Study (Study) is the second task of a work plan created by CRWA to serve CPUD. The first task was a system evaluation which is incorporated into this Study. The evaluation includes a description of the existing system demand, sources, treatment plant, storage tanks, and distribution system.

The main goal of this Study is to address the distribution system deficiencies faced by CPUD. The Study focuses on the distribution system to identify deficiencies using a hydraulic modeling software in conjunction with CPUD staff insights. Projects to improve the distribution system are identified and compared in the feasibility analysis. A conceptual level engineering design for each project is presented. Construction and operations and maintenance (O&M) costs for each alternative project are estimated. Project recommendations are prioritized for additional planning, engineering, and funding efforts. The last section of the report includes analysis, comparison, and recommendations for metering and data collection technologies to replace the existing water meters.

2.0 BACKGROUND

CPUD is registered with the SWRCB Division of Drinking Water (DDW) as a public community water system, number CA0510002. CPUD provides treated water to 6,254 people through 2,040 service connections in Mokelumne Hill, San Andreas, Paloma, and portions of the Glencoe and Railroad Flat communities in Calaveras County (Figure 1). CPUD's facilities include Jeff Davis Reservoir, one surface water treatment plant, one raw water pump station, two booster pump stations, one clearwell, five storage tanks, one hydropneumatic tank, three hydroelectric generating, pressure reducing stations, 18 miles of transmission main and over 20 miles of distribution main.

CPUD owns, operates, and maintains a treatment plant for surface water treatment. After treatment, the water is stored in the clearwell with a capacity of 0.5 million gallons (MG). From there, the water flows through transmission mains into the distribution system. The transmission mains consist of 16 to 27 inch diameter cement mortar lined and coated steel pipes. The distribution system consists of mains between 2 and 12 inches in diameter. Including the clearwell with the system's five storage tanks with a combined storage capacity of 5.45 MG.

Figure 1: Location Map

3.0 SYSTEM EVALUATION

3.1 Water Demands

CPUD provided daily water production records of the last 10 years (Table 1). Based on these records, the system average day demand (ADD) is 1.12 million gallons per day (MGD). Maximum Day Demand (MDD) and Peak Hourly Demand (PHD) were calculated according to Title 22 of California Code of Regulations (CCR). The day with the highest water usage, MDD, during the most recent 10 years of operation was identified as August 10, 2012, with 3.45 MGD, or 2,397 gallons per minute (gpm). To determine the PHD, the MDD was multiplied by a peaking factor of 1.5, which results in a system wide PHD of 3,500 gpm.

Table 1: 10 Year Average Day and Max Day Water Production

Year	Average Day (MGD)	Max Day (MGD)
2012	1.30	3.45
2013	1.39	2.49
2014	1.06	2.35
2015	0.94	2.19
2016	1.22	2.32
2017	1.15	2.37
2018	1.08	2.05
2019	1.07	2.30
2020	0.99	1.80
2021	0.97	1.86
10 Year Avg Day	1.12	
10 Year Max Day		3.45

3.2 Source of Water

CPUD obtains its water from the Mokelumne River where the system has a diversion dam located just below the confluence of the South and Licking Forks of the River (Figure 2). A safe yield established in Water Right Order 16338 limits the maximum water extraction from the river to 6,656 acre feet per year (AFY), or 2,169 million gallons (MG) each year. The safe yield is more than adequate to supply the 10 year maximum annual demand of 495 MG (year 2013). The dam allows the system to extract the water from the river through the raw water pump station with a capacity of 4.70 MGD (3,300 gpm). The water is then transported via a two mile long, 20 inch main to Jeff Davis Reservoir. The reservoir covers an area of 200 acres and has a capacity of 2,300 acre feet (AF), or 750 MG. Raw

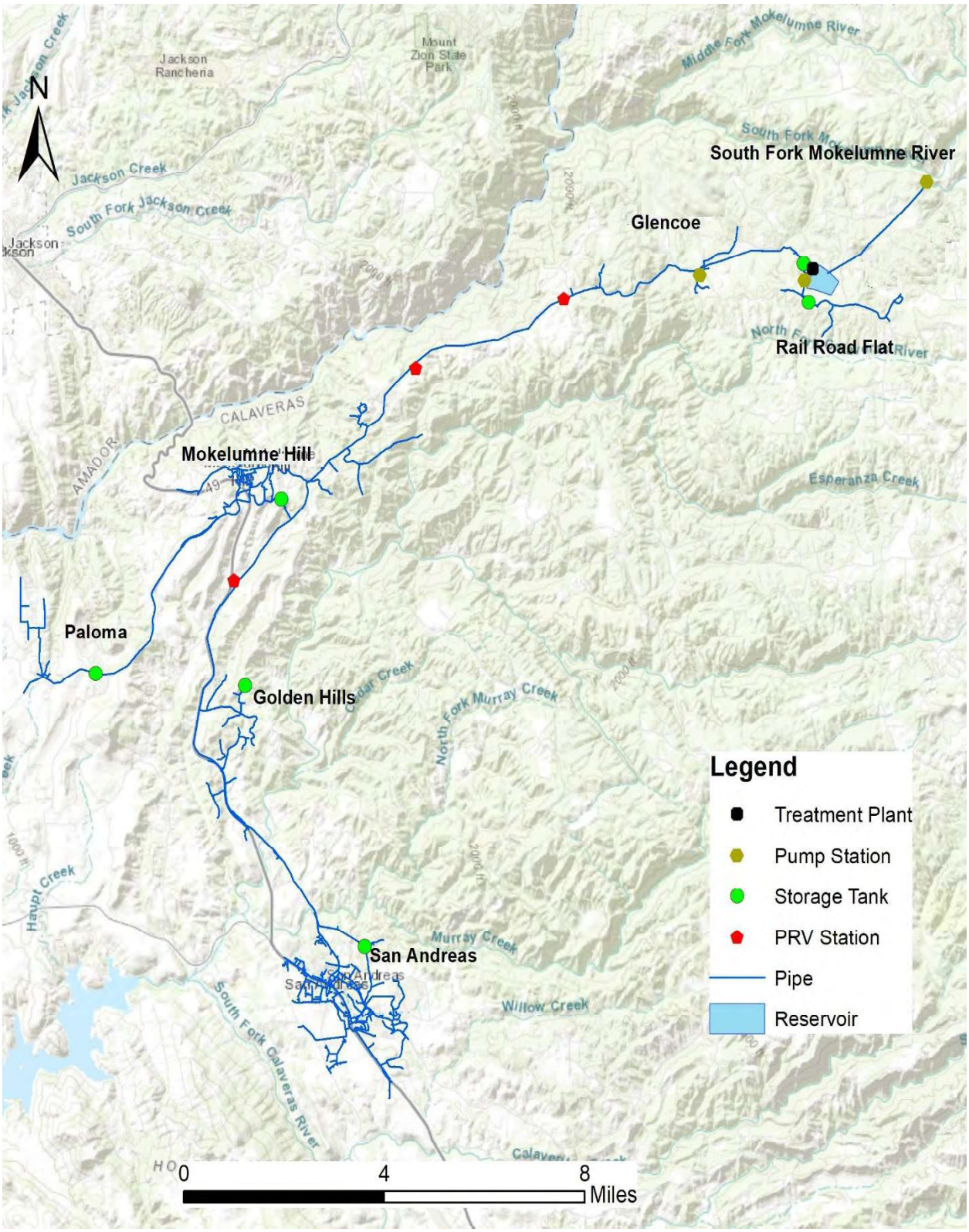


Figure 2: Water System Map

water flows by gravity from the reservoir to the water treatment plant located approximately 400 feet northwest of the reservoir.

CCR Title 22 requires systems with 1,000 or more service connections to meet four hours of PHD with source capacity, storage capacity, or emergency source connections. CPUD's source capacity is limited to the maximum treatment capacity of its treatment facility. The plant has a maximum capacity of 6.0 MGD, or 4,200 gpm, which is more than the PHD of 3,500 gpm. The source capacity meets the Title 22 requirement.

3.3 Water Treatment Plant

The treatment plant consists of six dual media pressure filters with a combined capacity of 6.0 MGD. The plant typically runs between 2.0 and 4.0 MGD and treats raw water using four treatment processes: pretreatment, filtration, disinfection, and corrosion protection. Chlorine (sodium hypochlorite) and polymer are added to the raw water prior to entry into the filters for disinfection and coagulation. Zinc orthophosphate is added to the treated water at the plant prior to the clearwell to control corrosion in the distribution system. Chlorine is also added to the treated water as it leaves the treatment plant. The system maintains a chlorine residual between 0.8 and 2.5 mg/L leaving the treatment plant.

3.4 Water Storage Tanks

CPUD owns and operates one clearwell at the treatment plant site and five additional water storage tanks located throughout the distribution system that store water to meet the daily demands and fire flow requirements. The system has a combined operating storage capacity of 5.45 MG. CPUD storage tanks can supply water for 26 hours at the PHD of 0.21 MGH. Storage tank details are shown in Table 2 below.

Table 2: Water Storage Tanks Details

Tank Name	Diameter (ft)	Height (ft)	Operating Range (ft)	Operating Capacity (MG)
Jeff Davis Clearwell	70	18	10 to 17	0.5
Railroad Flat	47	40	34 to 37	0.5
Mokelumne Hill	80	45	30 to 40	1.5
Golden Hills	20	16	10 to 14	0.035
Paloma	30	24	20 to 22	0.110
San Andreas	110	43	30 to 40	2.8
Total Capacity				5.45

The clearwell has a capacity of 0.5 MG. When clearwell level is 14 feet the treatment plant is turned on and once the level reaches 17 feet, the treatment plant is turned off. The

clearwell critical, or minimum level, is 10 feet. Below this level the volume is reserved for chlorine contact time. A new 0.5 MG tank clearwell is under construction, adjacent to the existing clearwell. The existing clearwell, which is around 50 years old, will be assessed for structural integrity to see if it is safe to continue being used once the new clearwell is completed.

Rail Road Flat Tank has a capacity of 0.5 MG and operates between 34 feet and 37 feet. It is filled by an 8 inch inflow/outflow pipe that comes from Rail Road Flat Pump Station. The Tank has a 12 inch outflow pipe that feeds the Rail Road Flat service area.

Mokelumne Hill Tank has a capacity of 1.5 MG and is filled by an 18 inch pipe supplied by the 18 inch transmission main in the Happy Valley area. The inflow/outflow pipe can supply the transmission main when needed to feed the system when the pressure in the main drops. The inflow/outflow pipe is located at a Tank level of 18 feet. Below this level, water cannot flow back to the transmission main. The Tank has an additional 14 inch outflow pipe at the bottom Tank, supplying water to the Mokelumne Hill service area and the Paloma Tank. Normally the Tank operates between 30 feet and 40 feet.

Paloma Tank has a capacity of 0.11 MG and is gravity fed by a 6 inch pipe that comes from Mokelumne Hill Tank. The Tank operates between 20 feet and 22 feet to ensure there is enough water Tank for emergency use.

Golden Hill Tank has a storage capacity of 0.035 MG and has a 6 inch inflow/outflow pipe. The Garamendi Pressure Reducing Valve (PRV) downstream pressure needs to be at least 90 pounds per square inch (psi) to open the 2 inch valve that feeds the Golden Hill Tank. During high demand, typically in the summer, the pressure may drop lower than 90 psi and the valve is opened manually to feed the Golden Hill Pressure Zone but the Tank cannot be filled because the pressure is not high enough. Normally the Tank operates between 10 feet and 14 feet.

San Andreas Tank is the largest Tank in the system with a capacity of 2.8 MG. The Tank has an operating range between 30 feet and 40 feet. The 18 inch inflow pipe has a 10 inch electrically actuated, Cla-Val, altitude valve which maintains the level in the Tank. The valve opens when Tank level is 35 feet and closes when it reaches 40 feet. The valve is only permitted to open partially because there is not enough supply for Mokelumne Hill Tank when it is fully open. In the summer, the valve opens at 7 AM, even if the level is above 35 feet, to keep more water in Tank for high demand during the day. A normally closed 18 inch bypass next to the control valve can be manually opened during power outages. The Tank has an 18 inch outflow pipe that feeds San Andreas and a 6 inch pipe the feeds a few houses next to the Tank.

3.5 Transmission/Distribution System

Treated water from the treatment plant is carried through approximately 18 miles of transmission main to Mokelumne Hill, Paloma, and San Andreas. Transmission mains are made of mortar lined and coated steel pipe, ranging in size from 16 to 27 inches in diameter. Distribution mains range from 2 to 12 inches in diameter and are made of steel, Polyvinyl Chloride (PVC), high density polyethylene (HDPE), and galvanized iron.

Due to the large differences between the highest and lowest elevations of the system, CPUD utilizes pressure reducing stations to keep the water pressure between35 and 115 psi. The distribution system is divided into 17 pressure zones (PZ) by 17 PRVs, five storage Tanks, and two pump stations (Figure 3). There are three main PRV stations which are used to regulate the pressure in the transmission main. These stations use hydroelectric turbines to generate electricity while reducing pressure.

The distribution system has two pump stations: Rail Road Flat and Glencoe Pump Stations. Rail Road Flat Pump Station pumps water from the clearwell to fill the Rail Road Flat Tank. Rail Road Flat Pump Station has two 25 horsepower (hp) pumps. Pump No. 1 has a capacity of 250 gpm and is turned on when the Rail Road Flat Tank level reaches 35 feet and is turned off when the level is 37 feet. Pump No. 2 has a capacity of 245 gpm and is turned on with Pump No. 1 when the Rail Road Flat Tank level reaches 34 feet and turned off when Tank level reaches 37 feet.

Glencoe Pump Station has two 25 hp pumps that boost water into a hydropneumatic tank at the pumphouse. The hydropneumatic tank has a capacity of 20,000 gallons. The pumps operate in lead and lag sequence. The hydropneumatic tank operates at 120 to 150 psi. Glencoe Pump Station is equipped with a backup generator.

4.0 STATEMENT OF PROBLEM

CPUD's distribution system needs improvements in several areas. There are 18 miles of transmission and over 20 miles of distribution main in the water system, ranging in age from over 50 years old to new installations. Much of this infrastructure has exceeded its design life and needs replacement. The system has several pressure zones with very high pressures that need to be addressed. These high pressure zones coupled with aging pipe result in leaks and significant water loss. Monthly data shows a discrepancy between the treated water meter and customer meter data. This may be a result of pipe leakage

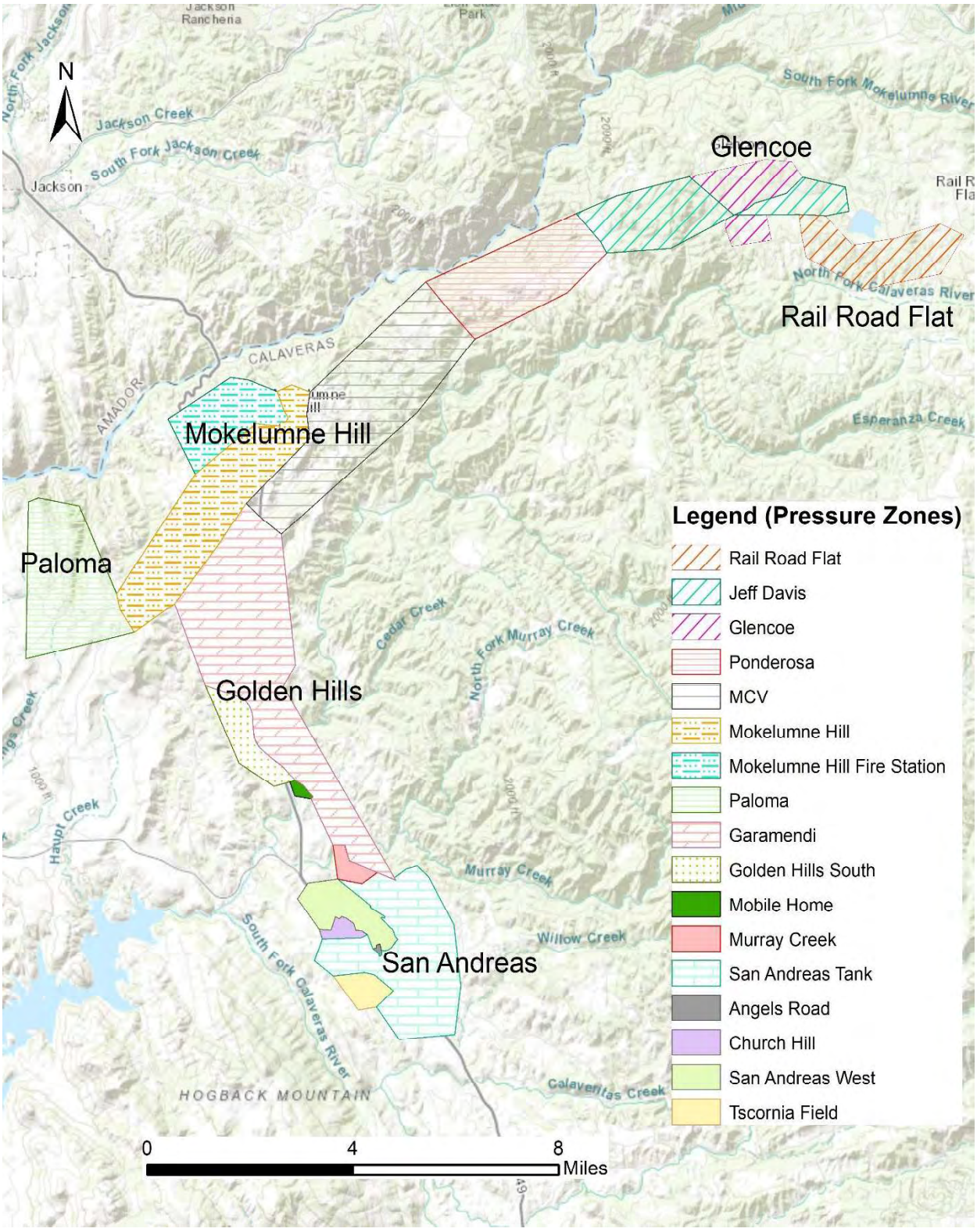


Figure 3: Pressure Zone Map

and old meters not recording accurately. Water meters are past their design life as well and need to be replaced with new meters.

In some areas, the system cannot provide the required flow for fire protection. The system has adequate source capacity but does not have storage, pumping capacity, or large enough pipes to supply fire flow in specific areas. Wildfires are a growing risk in the area, which adds to the importance of fire flow to protect the system.

5.0 DISTRIBUTION SYSTEM FEASIBILITY ANALYSIS

CRWA conducted this Study to evaluate the existing distribution system components and operating conditions, identify the priority needs, and to analyze different approaches to address them. CRWA developed a distribution system hydraulic model to analyze water pressure, pressure zone supply and demand, and fire flow for the distribution system. Based on the results of the hydraulic modeling distribution system improvements for supply reliability and fire protection are proposed. Conceptual level construction, and operations and maintenance cost estimates have been provided as well. Project recommendations are based on the results of the model, site visit observations, and problems reported by CPUD staff. Water meter replacement is analyzed independently of the distribution system feasibility study and is presented in a separate section.

5.1 Distribution System Modeling

5.1.1 Building the Network

CPUD provided system information and maps for CRWA to create a hydraulic model of the distribution system using InfoWater, a geographic information system (GIS) enabled hydraulic modeling software. The model was created by adding pipes and major system components such as reservoirs, storage tanks, pumps, and valves.

Pipe diameters and Hazen-Williams ‘C’ factor were entered manually but pipe lengths were calculated by the software based on the location of pipe start and end nodes on the base map. Elevation of the nodes were obtained from a Digital Elevation Model (DEM), downloaded from United States Geological Survey (USGS) website. Elevations were extracted from the DEM based on the location of each node on the map. The Jeff Davis Reservoir was added to the model as a constant head reservoir. The head was assumed to be the elevation difference between the treatment plant and reservoir’s water surface.

PRV locations and settings were obtained from a Diamond Maps digital map provided by CPUD. Storage tanks’ heights, diameters, and operating levels were obtained from Diamond Maps as well. Hydropneumatics tanks, booster pumps, and PRV Stations

operational data were obtained during the site visit. Due to the size and complexity of the system, the hydraulic model includes the transmission mains and a majority of distribution mains sufficient to model the system accurately.

5.1.2 Hydraulic Criteria of the Model

InfoWater uses the Hazen Williams equation for hydraulic analysis. The model software calculates flow and head loss in pipes, demand and pressure at nodes, flow and pressure at pump stations, and water levels in storage tanks. For all existing mains, Hazen Williams 'C' factor of 120 was assigned, in accordance with CPUD Improvement Standards, Section 1005. InfoWater models the reservoir as an external source with infinite supply. The supply from Jeff Davis Reservoir is limited by the capacity of the water treatment plant. Therefore, the flow from the reservoir to the clearwell is limited to the maximum treatment capacity (6.0 MGD) in the model.

Storage tanks operating levels were entered in the model, which control booster pumps and valves' operations. Booster pumps are modeled based on design operating points and are controlled by the tank water levels. The hydropneumatic tank is modeled as a cylindrical storage tank where the maximum and minimum water levels correspond to the high and low pressures, respectively.

Service connections (water meters) were counted from provided maps and assigned to the nearest model node. Each service connection is then assigned an average demand, in gpm, which is obtained by dividing the total demand to the number of service connections. The model is set to analyze the distribution system under extended period simulation of up to one week, to ensure the system could manage several back to back high demand days without experiencing problems. A standard InfoWater diurnal pattern was used to distribute the demand changes over the course of the day.

Fire flow requirements are set forth in Section 1005 F of the District Improvement Standards. The requirement is 500 gpm for single family and duplex residential areas, 1,000 gpm for townhouse and multiple residential areas, and 2,500 gpm for commercial areas. CPUD does not have a fire flow map to identify type of buildings, therefore, a fire flow of 500 gpm (with a minimum residual pressure of 20 psi for a duration of two hours was assumed for all demand nodes to show available fire flow throughout the system.

5.1.3 Model Calibration

CRWA used field tests data from February 2021 to calibrate the model to the actual system. The tests were performed by CPUD staff on fire hydrants throughout the system and included flow, static, and residual pressure data. Both static and residual pressures were compared. Daily water demands from February 2021 were used in the model to

closely match the days which the tests were performed. American Water Works Association (AWWA) *Manual 32-Computer Modeling for Distribution System* guidelines were followed throughout this process. The guideline recommendations are as follows:

1. For distribution system rehabilitation studies and fire flow analysis: model pressures should be within 4.3 psi (10 feet of head) of those recorded in the field.

2. For rural water systems without fire flow: model pressures should be within 8.6 psi (20 feet of head) of those recorded in the field.

The model results throughout the system were within the range of the first category without the need for any adjustments except for Mokelumne Hill Fire Station PZ, which had model pressures around 10 psi below field pressures. This PZ's PRV setting in the model was set at 30 psi but the actual setting during the field tests is unknown, which could be the cause behind this 10 psi difference. The PRV setting was adjusted in the model resulting in a closer match to the actual system.

5.1.4 Analysis and Results

The model simulated the water system from the clearwell through the distribution system and all storage tanks. Flow rates, velocities, pressures, pumping rates, storage levels, demands, and supply under a variety of operating conditions were calculated and analyzed. Both ADD and MDD scenarios were analyzed for extended periods of time, up to one week. Fire flow was also tested under both conditions. Water quality modeling is excluded from this analysis. The demand assigned to each PZ was adjusted with varying multiplication factors as smaller zones would typically have greater variation in demand. Pressures within each PZ are compared with CPUD standard required pressure of 35 to 115 psi. The analysis and results for each PZ is presented below. See Appendix A for model generated pressure maps.

5.1.4.a Rail Road Flat

This PZ is separated from Jeff Davis PZ by Rail Road Flat Pump Station. The pressure throughout the PZ is provided by gravity from Rail Road Flat Tank. There are 49 service connections and 10 fire hydrants in this PZ. The system can supply MDD and fire flow throughout this PZ. Most demand nodes have pressures within CPUD requirements except one area with three services on Simpson Road, which have pressures around 125 psi.

5.1.4.b Jeff Davis

This PZ begins from the clearwell and is separated from Glencoe PZ by Glencoe Pump Station and from Ponderosa PZ by Ponderosa PRV Station. This PZ is gravity fed by the

clearwell and has 32 service connections with a MDD of 38 gpm. There are four fire hydrants in this PZ. The system can supply the MDD and fire flow throughout the PZ. Most demand nodes have pressures within the requirements. Approximately five services on the transmission pipe before the Ponderosa PRV Station have high pressures, around 220 psi.

5.1.4.c Glencoe

This PZ is separated from Jeff Davis PZ by the Glencoe Pump Station. Pressure throughout this PZ is maintained by the hydropneumatics tank which operates between 120 and 150 psi. There are 30 service connections in this PZ with a MDD of 35 gpm. This PZ has four fire hydrants. The system can supply the MDD to all demand nodes in this PZ. However, Glencoe Pump Station and hydropneumatic tank do not have adequate capacity to supply the fire flow for two hours. Approximately seven service connections have pressures above CPUD standard pressure.

5.1.4.d Ponderosa

This PZ begins from Ponderosa PRV Station and ends at MCV PRV Station. This PZ is gravity fed by the overflow from Jeff Davis PZ. There are 16 service connections in this PZ with an estimated MDD of 28 gpm. This PZ has only two fire hydrants. The system can supply the MDD and fire flow in the PZ. The transmission main section before MCV PRV Station has pressures as high as 230 psi.

5.1.4.e MCV

This PZ begins from MCV PRV Station and is separated from Mokelumne Hill and Garamendi PZs by the Mokelumne Hill Tank and Garamendi PRV Station, respectively. This PZ is gravity fed by overflow from Ponderosa PZ. There are 80 service connections in this PZ with a MDD of 94 gpm. This PZ has 17 fire hydrants. The system can supply the MDD and fire flow in the PZ. Around 20 service connections have pressures above CPUD standard pressure. The transmission main section before Garamendi PRV Station has pressures as high as 260 psi.

5.1.4.f Mokelumne Hill

This PZ begins from Mokelumne Hill Tank and is separated from the Mokelumne Hill Fire Station PZ by two PRVs and two closed valves, and from Paloma PZ by the Paloma Tank. This PZ is gravity fed by the Mokelumne Hill Tank. There are 155 service connections in this PZ with an estimated MDD of 182 gpm. This PZ has 13 fire hydrants. The system can supply the MDD and fire flow in the PZ. Approximately 30 service connections in this PZ have pressures above CPUD standard pressure.

5.1.4.g Mokelumne Hill Fire Station

This PZ is separated from Mokelumne Hill PZ by two PRVs and two closed valves. This PZ is gravity fed by Mokelumne Hill Tank. There are 210 service connections in this PZ with a MDD of 247 gpm. There are 28 fire hydrants in this PZ. The system can supply the MDD but cannot supply fire flow to all fire hydrants. About five services in this PZ have pressures of up to 135 psi.

5.1.4.h Paloma

This PZ is separated from Mokelumne Hill PZ by the Paloma Tank and is gravity fed by the Tank. There are 95 service connections in this PZ with a MDD of 112 gpm. This PZ has 16 fire hydrants. The system can supply the MDD and fire flow in the PZ. Approximately 10 service connections have pressures above CPUD standard pressure.

5.1.4.i Garamendi

This PZ begins from Garamendi PRV Station and is separated from Golden Hills South, Mobile Home, Murray Creek, and San Andreas PZs by Golden Hills PRV, Golden Strike Road PRV, Leonard Road PRV, and the San Andreas Tank, respectively. Water from transmission main in higher altitudes flows into the Golden Hills Tank. There are 90 service connections in this PZ with a MDD of 106 gpm. This PZ is gravity fed and has 10 fire hydrants. The system can supply the MDD but cannot supply fire flow to the fire hydrants in the Golden Hills area. Most parts of the transmission pipe in this PZ have high pressures, up to 260 psi.

5.1.4.j Golden Hills South

This PZ is separated from Garamendi PZ by Golden Hills PRV. There are 70 service connections in this PZ with a proportional MDD of 82 gpm. This PZ is gravity fed and has nine fire hydrants. The system can supply the MDD and fire flow in the PZ. Approximately 20 services in this PZ have high pressures of up to 200 psi.

5.1.4.k Mobile Home

This small PZ is separated from Garamendi PZ by Golden Strike Road PRV. There are only two service connections in this PZ with an estimated, proportional MDD of 9 gpm. This PZ is gravity fed and has three fire hydrants. The system can supply the MDD and fire flow in the PZ. All demand nodes have pressures within CPUD's requirements.

5.1.4.l Murray Creek

This PZ is separated from Garamendi and San Andreas PZs by Leonard Road PRV and a closed valve, respectively. There are 26 service connections in this PZ with an estimated

MDD of 31 gpm. This PZ is gravity fed by the overflow from Garamendi PZ. There are seven fire hydrants in this PZ. The system can supply the MDD and fire flow throughout the PZ. All demand nodes have pressures within CPUD's requirements.

5.1.4.m San Andreas Tank

This PZ begins from the San Andreas Tank and is separated from Murray Creek PZ by a closed valve, from San Andreas West PZ by four PRVs, from Angels Road PZ by one PRV, from Church Hill PZ by one PRV, and from Tscornia Field PZ by one PRV. This PZ is gravity fed by the San Andreas Tank. There are 470 service connections in this PZ with a MDD of 552 gpm. There are 60 fire hydrants in this PZ. The system can supply the MDD and fire flow in the PZ. About 30 service connections have pressures above CPUD standard pressure.

5.1.4.n San Andreas West

This PZ is only connected to the San Andreas Tank PZ, through four PRVs; San Andreas Elementary, Forestry, Ken James, and Cemetery 2. There are 500 service connections in this PZ with a MDD of 588 gpm. This PZ is gravity fed by the San Andreas Tank and has 45 fire hydrants. The system can supply the MDD and fire flow in this PZ. Approximately 40 service connections have pressures above CPUD standard pressure.

5.1.4.o Angels Road

This PZ is only connected to San Andreas Tank PZ through Angels Road PRV. There are 18 service connections in this PZ with an estimated MDD of 32 gpm. This PZ is gravity fed by the San Andreas Tank via the PRV and has no fire hydrants. The system can supply the MDD in the PZ. Demand nodes have pressures within CPUD's requirements.

5.1.4.p Church Hill

This PZ is only connected to the San Andreas Tank PZ through the Cemetery 1 PRV. There are 125 service connections in this PZ with a MDD of 147 gpm. This PZ is gravity fed by the San Andreas Tank and has eight fire hydrants. The system can supply the MDD and fire flow in the PZ. All demand nodes have pressures within CPUD's requirements.

5.1.4.q Tscornia Field

This PZ is only connected to San Andreas Tank PZ through Tscornia Field PRV. There are 17 service connections in this PZ with a proportional MDD of 30 gpm. This PZ is gravity fed by the San Andreas Tank and has nine fire hydrants. The system can supply the MDD and fire flow in the PZ. Demand nodes have pressures within CPUD's requirements.

5.2 Distribution System Projects

5.2.1 Main Replacement Projects

A majority of the transmission main and distribution mains are 50 years old and nearing the end of their design life. Mains have been replaced on an as needed basis due to leaks or planned system improvements. CPUD currently has a project initiated to replace the transmission main along the Rich Gulch area in the Ponderosa PZ. Four additional main projects have been identified in this study and presented in the subsequent Sections.

5.2.1.a Transmission Line between Mokelumne Hill and Golden Hills

The transmission main from Mokelumne Hill to Golden Hills is 18 inches in diameter main and approximately 4 miles long. This portion of the system experiences pressures exceeding 200 psi. This transmission main is more than 50 years old. This project was identified as a need for CPUD because there is no redundant main to supply the Golden Hills PZ, and the San Andreas Tank PZ further downstream (Figure 4). Approximately 1,300 service connections depend on this transmission main. The existing transmission main may be repurposed as a redundant backup main or be abandoned during construction. The construction cost for the project is estimated to be $9.5 million. The estimate in Table 3 reflects the best information available to date.

Table 3: Mokelumne Hill to Golden Hills Main Replacement Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$573,000
18 inch main including excavation, backfill, and compaction	22,000	LF	$250	$5,500,000
Valves and fittings	1	LS	$228,400	$228,400
Design, documentation, and fees	1	LS	$523,000	$523,000
Project Administration	1	LS	$485,800	$485,800
Subtotal Estimated Cost				**$7,310,000**
Contingency @ 30%				**$2,193,000**
Conceptual Level Estimated Construction Cost				**$9,503,000**

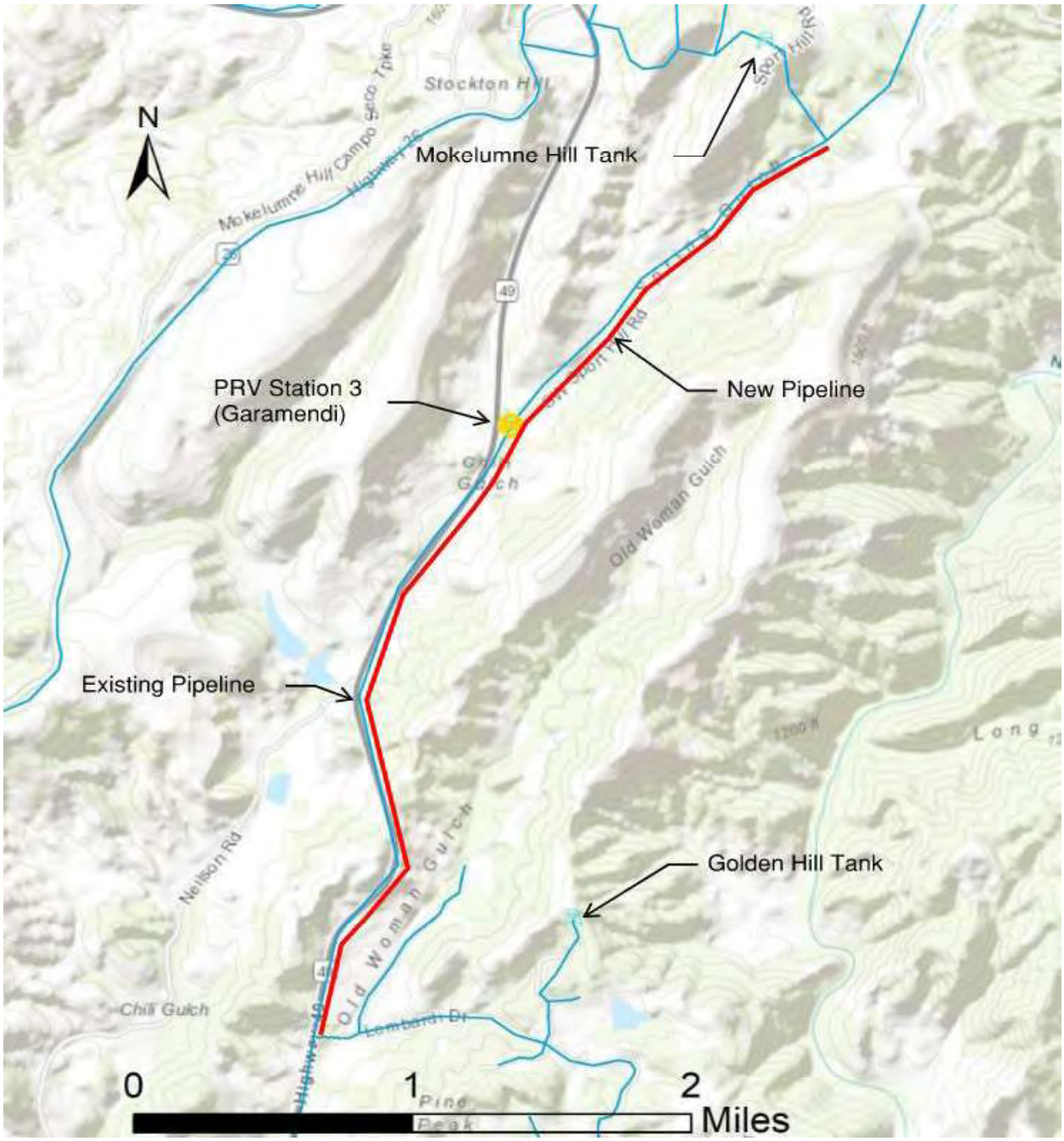


Figure 4: Transmission Main from Mokelumne Hill to Golden Hills

5.2.1.b Transmission Main between Golden Hills and San Andreas

The transmission main from Golden Hills to San Andreas is 18 inches in diameter and approximately 5 miles long. This portion of the system experiences pressures exceeding 200 psi. The transmission main is more than 50 years old. This project was identified as a need for the CPUD as there is no redundant main to supply the San Andreas zones, and in

turn the San Andreas Tank (Figure 5). Over 1,000 CPUD customers depend on the main for their water supply. The construction cost for the project is estimated to be $11.2 million. The estimate in Table 4 reflects the best information available.

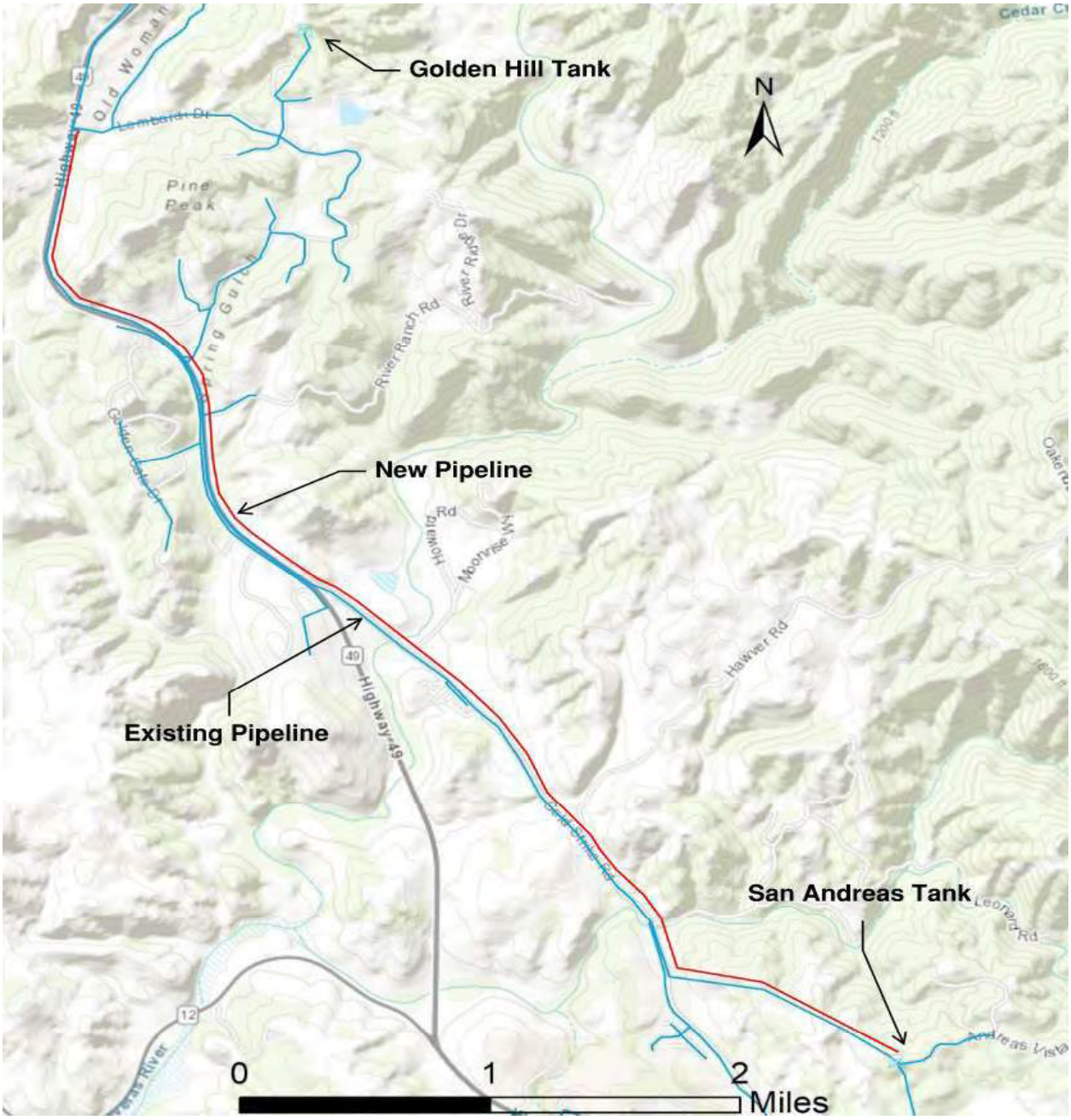


Figure 5: Transmission Main from Golden Hills to San Andreas

Table 4: Golden Hills to San Andreas Main Replacement Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$677,000
18 inch transmission main including excavation, backfill, and compaction	26,000	LF	$250	$6,500,000
Valves and fittings	1	LS	$269,900	$269,900
Design, documentation, and fees	1	LS	$618,100	$618,100
Project Administration	1	LS	$574,100	$574,100
Subtotal Estimated Cost				**$8,639,000**
Contingency @ 30%				**$2,592,000**
Conceptual Level Estimated Construction Cost				**$11,231,000**

5.2.1.c Replace Distribution Mains in San Andreas Tank PZ

The San Andreas Tank PZ contains nearly three miles of distribution main 4 inches in diameter and smaller. These mains restrict the available fire flow in certain areas of the PZ. The mains are nearly 50 years old and near the end of their design life. It is recommended that the pipes be replaced with 8 inch diameter mains. There is a 10 inch diameter transmission main in the PZ that runs along Main Street and Highway 49. The main has had many leaks recently and should also be replaced as part of this project. It is recommended that this pipeline be replaced with a 12 inch diameter pipeline. The construction cost for the project is estimated to be $6.7 million. The conceptual level project construction cost estimate is in Table 5 below.

Table 5: Distribution Mains in San Andreas Tank PZ Replacement Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$319,000
8 inch main including excavation, backfill, and compaction	16,000	LF	$185	$2,960,000
12 inch main including excavation, backfill and compaction	2,750	LF	$220	$605,000
Valves and fittings	1	LS	$276,500	$276,500
Design, documentation, and fees	1	LS	$496,100	$496,100
Project Administration	1	LS	$474,100	$474,100
Subtotal Estimated Cost				**$5,169,000**
Contingency @ 30%				**$1,551,000**
Conceptual Level Estimated Construction Cost				**$6,720,000**

5.2.1.d Replace Undersized Distribution Mains in Mokelumne Hill PZ

The Mokelumne Hill PZ contains approximately 1 mile of mains 4 inches in diameter and smaller. These mains restrict the available fire flow in certain areas of the PZ. The mains are nearly 50 years old and need replacement. It is recommended that the mains be replaced with 8 inch diameter C 900 PVC pipe. Table 6 shows the construction cost for the project estimated to be $1.9 million.

Table 6: Undersized Distribution Mains in Mokelumne Hill PZ Replacement Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$110,000
8 inch main including excavation, backfill, and compaction	5,500	LF	$185	$1,017,500
Valves and fittings	1	LS	$79,200	$79,200
Design, documentation, and fees	1	LS	$156,400	$156,400
Project Administration	1	LS	$138,400	$138,400
Subtotal Estimated Cost				**$1,502,000**
Contingency @ 30%				**$451,000**
Conceptual Level Estimated Construction Cost				**$1,953,000**

5.2.1.e Mokelumne Hill to Paloma Transmission Main Replacement

The transmission main between the Mokelumne Hill Tank and the Paloma Tank is at the end of its useful life. CPUD has identified this project as a concern because the transmission line requires frequent repairs and there is no redundant supply to the Paloma Tank. The current pipe is approximately 5 miles long and 6 inches in diameter and it is recommended to be replaced with 8 inch diameter pipe. The cost to construct the project is estimated to be $8.5 million.

Table 7: Mokelumne Hill to Paloma Transmission Main Replacement Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$110,000
8 inch main including excavation, backfill, and compaction	24,750	LF	$185	$4,579,000
Valves and fittings	1	LS	$79,200	$238,000
Design, documentation, and fees	1	LS	$156,400	$687,000
Project Administration	1	LS	$138,400	$609,000
Subtotal Estimated Cost				**$6,595,000**
Contingency @ 30%				**$1,979,000**
Conceptual Level Estimated Construction Cost				**$8,574,000**

5.2.2 Glencoe PZ Fire Flow Improvements

The booster pumps and hydropneumatic tank at the Glencoe Pump Station currently meet the domestic demand but do not have the capacity to provide fire flow of 500 gpm for two hours. Construction of a 500 gpm fire pump station next to Glencoe Pump Station (Figure 6) would resolve the issue. The pump station would pump water from the 27 inch transmission main in Ridge Road. With this solution a storage tank is not required. The clearwell and treatment plant have the capacity to provide the required fire flow. The fire pump station would only be used during a fire flow emergency, therefore, minimizing the cost of O&M. The cost to construct the project is estimated to be $410,000. A breakdown of the cost is presented in Table 8.

Table 8: Glencoe Fire Flow Pump Station Construction Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$24,000
Fire pump station (500 gpm) including weather enclosure	1	LS	$122,300	$122,300
Pipes, valves, and fittings	1	LS	$31,100	$31,100
Electrical and controls	1	LS	$50,900	$50,900
Design, Documentation, and Fees	1	LS	$34,400	$34,400
Project Administration	1	LS	$52,000	$52,000
Subtotal Estimated Cost				**$315,000**
Contingency @ 30%				**$95,000**
Conceptual Level Estimated Construction Cost				**$410,000**

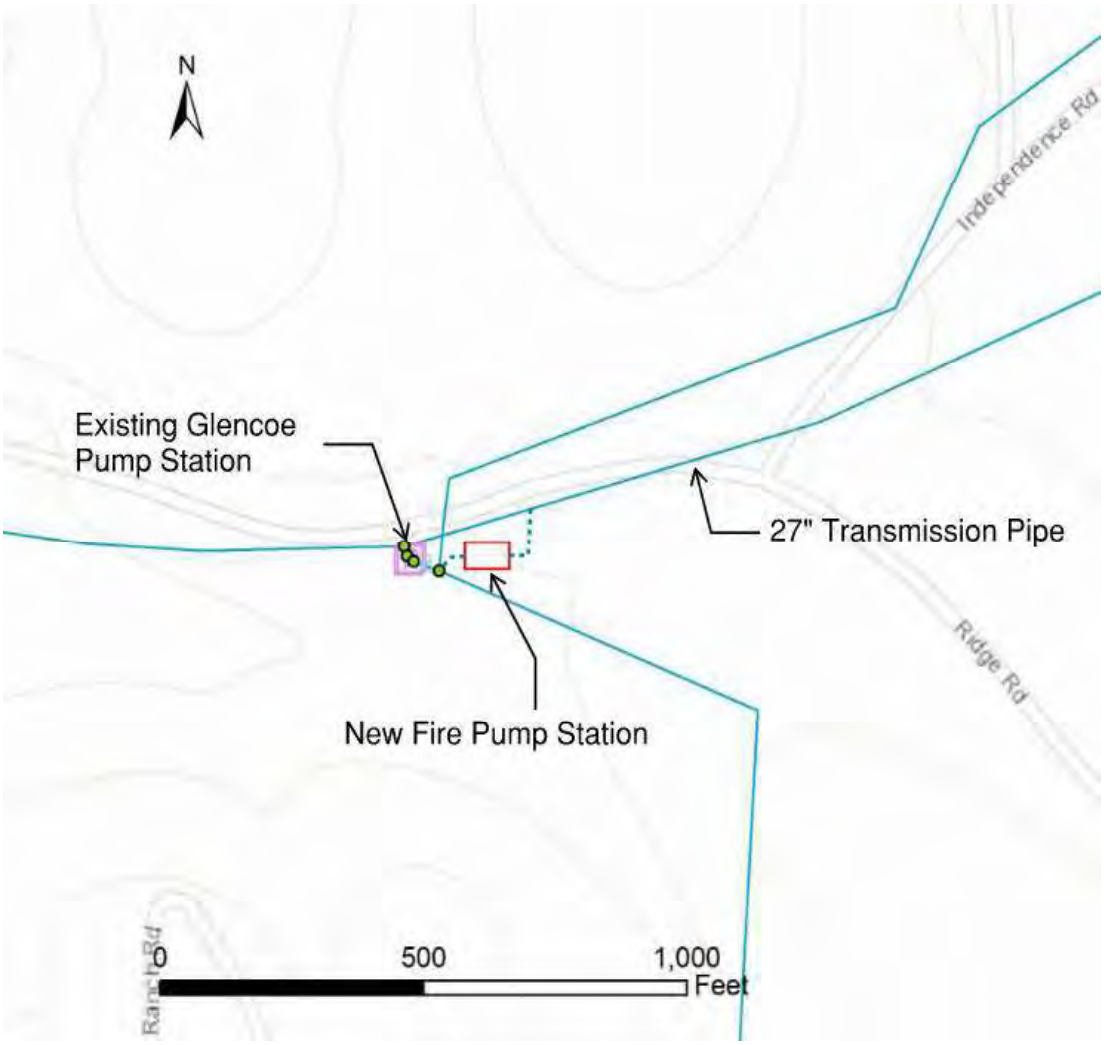


Figure 6: Glencoe Fire Pump Station

5.2.3 Golden Hills Fire Flow Improvements

Golden Hill Tank does not have the capacity to provide fire flow for two hours. This issue could be resolved by replacing the existing 2 inch pipe that connects the PZ to the transmission main with an 8 inch pipe (Figure 7). The existing 2 inch pipe has a length of approximately 250 feet. The system would not need to add additional storage because the pipe intake would be the 16 inch transmission main that is fed by Mokelumne Hill Tank and the clearwell. Adding additional storage is not desirable because of lack of use during low demand seasons, resulting in loss of chlorine residual in the Golden Hill Tank. In addition, the transmission main does not have enough pressure during high demands to fill the Tank. The pressure at this point is high enough to supply domestic and fire flow and would not need the addition of booster pump(s).

The cost to construct the project is estimated to be $116,000. A breakdown of the cost is presented in Table 9. The estimate reflects the best information available to date.

Table 9: Golden Hills Fire Flow Improvements Cost

Item	Quantity	Unit	Unit Cost	Cost
Mobilization / Demobilization	10%	LS	-	$6,000
8 inch main including excavation, backfill, and compaction	250	LF	$185	$46,250
Valves and fittings	1	LS	$12,000	$12,000
Design, documentation, and fees	1	LS	$16,600	$16,600
Project Administration	1	LS	$8,200	$8,200
Subtotal Estimated Cost				$89,000
Contingency @ 30%				$27,000
Conceptual Level Estimated Construction Cost				$116,000

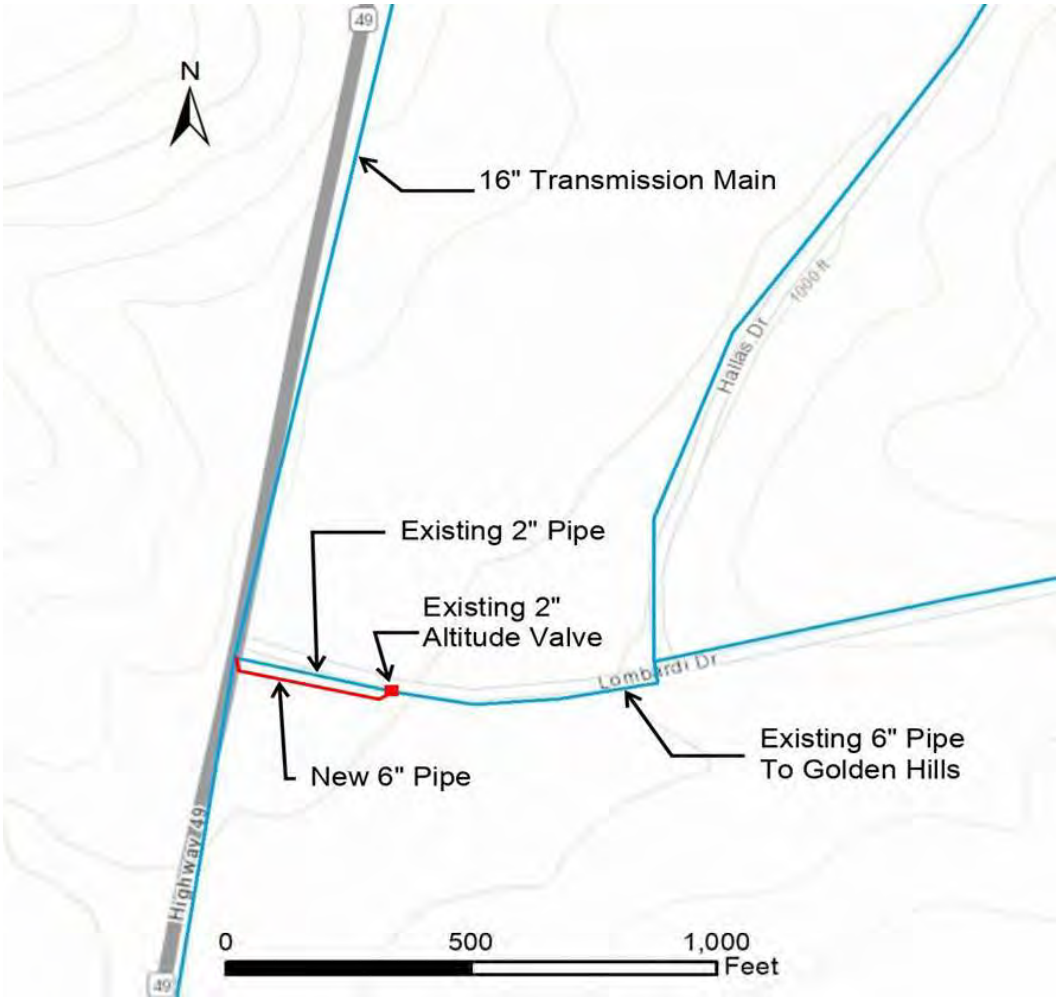


Figure 7: Golden Hills Fire Flow Improvements

5.2.4 Consolidation with a Nearby Water System

There are two water systems located within three miles of CPUD: Amador Water Agency – Buckhorn Plant and Amador Water Agency – Tanner, see Figure 8. However, CPUD is separated from these systems by the Mokelumne River and a canyon with depth of approximately 2,000 feet. For this reason, it is unfeasible to physically connect to these systems. If consolidation were feasible, the issues CPUD is facing would not be solved by consolidation and would still need to be addressed. CPUD needs distribution improvements but has enough source supply and storage capacity to provide water to its customers.

Figure 8: Water Systems Near CPUD

5.3 Conclusion and Recommendations

The projects presented above are of great importance to the overall reliability of the distribution system. In addition to the priority projects mentioned above, CRWA recommends that CPUD assess, prioritize, and plan to replace the remaining mains that are over 50 years old or prone to leaking. Transmission mains must be evaluated carefully, especially in areas that have history of leaks and high pressures. Leak detection technology is available and should be used to assess mains. Mains constructed of inadequate material to withstand high pressures should be replaced with higher pressure rated pipes.

CRWA has prioritized the projects to help CPUD pursue funding and construction based on the urgency of each project, as follows. The projects are all feasible to construct and no viable alternative projects were identified to compare them to.

5.3.1 Priority 1: Replacement of Transmission Lines

CPUD is split into various populated zones which are supplied by the trunk transmission mains. This leaves the lower zones vulnerable because there is no redundancy in the system to supply water in case of a break in the transmission main upstream. The transmission main in the Rich Gulch area leaks and a project is currently in progress to replace that section. The transmission mains discussed in section 5.2.1 are of the same age and may experience the same issues as the Rich Gulch area. These mains are critical and should be replaced with redundant parallel mains that have adequate pressure ratings to ensure reliable supply to the lower portions of the system.

5.3.2 Priority 2: Replace Undersized Distribution Pipes

The undersized mains in the Mokelumne Hill and San Andreas Tank zones limit the available flow in the pressure zones. The pipes are nearly 50 years old and have reached their expected design life. It is recommended the smaller mains be upgraded to 8 inch pipe and the 10 inch main along Highway 49 in the San Andreas Tank zone be replaced with 12 inch pipe to provide reliable distribution and fire flow throughout these two zones.

5.3.3 Priority 3: Replace Mokelumne Hill to Paloma Transmission Main

The existing transmission main between the Mokelumne Hill and Paloma zone is approximately 50 years old and has exceeded the expected design life. Replacement of the existing 6 inch pipe with an 8 inch pipe will provide the Paloma zone with increased flow and reliable supply.

5.3.4 Priority 4: Improve Fire Flow for Glencoe

CPUD, and in particular the Glencoe area, is vulnerable to wildfires. Fire protection system deficiencies should be addressed before projects of lesser importance. CRWA recommends construction of a 500 gpm fire pump station next to the existing Glencoe Pump Station. The new pump station would have minimal O&M costs because it is a backup station that would only be used for fire flow emergency. The existing pumps and hydropneumatic tank will remain in service to provide domestic flows.

5.3.5 Priority 5: Improve Fire Flow for Golden Hills

This project is of the same importance as Priority 2 because it addresses fire flow for an area of similar size. This project would only require a limited pipe replacement. No booster(s) would be needed because the pipe taps off the transmission main which has adequate pressure and flow to supply fire flow throughout the Golden Hills area.

6.0 WATER METER REPLACEMENT

CPUD's water meters are past their design life and need to be replaced with modern equipment. CPUD has a total of 2,438 water meters, ranging in size from 5/8 to 8 inches. These meters have no automatic reading capabilities. CPUD personnel go to each meter box and manually read the dials on the meter to determine billing. With the new technology, this will no longer be needed as this can be done walk by/drive by with a smartphone or laptop, or real time reading from the office (depending on the technology). While a majority of the meters are located adjacent to roadways, some are located in remote areas which require CPUD personnel walk to them. These remote meters can use cellular technology to automatically transfer reading data to the internet. New meters will help the system to:

- Manage water loss and conserve water throughout the system.
- Improve efficiency by reducing both time and costs for meter reading.
- Enhance water and energy conservation.
- Improve accuracy, as a result reducing billing errors and disputes.
- Improve accuracy by replacing older less accurate meters.
- Identify and isolate areas where water loss is occurring so appropriate repairs and upgrades can be made.
- Monitor tampering and enhance security.

There are three types of water meters: displacement (mechanical), nondisplacement, and compound meters. CPUD's current meters are displacement type. Most accurate meters

for potable water application are electromagnetic (mag) and ultrasonic nondisplacement meters. Both are available in sizes from 1/2 to 72 inch, covering CPUD's meter sizes.

Both mag meters and ultrasonic meters have no moving parts and require no maintenance. Both meter types provide highly accurate flow readings for water applications. Mag meters have inaccuracies of ±0.5 percent of flow rate or less. In comparison, ultrasonic meters have inaccuracies of ±1 to 2 percent.

There are two advanced technologies for meter reading and data collection. Automated Meter Reading (AMR) and Advanced Metering Infrastructure (AMI). Every AMR and AMI system is made of the following main components:

- Meters: compatible with AMR and AMI systems.
- Registers: devices that record the flow readings measured by the meters.
- Endpoints: devices that transmit the data from Registers to Data Collectors.
- Data Collectors: mobile data collectors for AMR system such as handheld devices or vehicle mounted, and fixed location data collectors for AMI system such as gateways.
- Software: stores and analyzes the data.

6.1 Meter Alternatives

CRWA explored meters and data collection technologies from three leading meter suppliers: Mueller, Kamstrup, and Neptune. Mueller offers the Solid State Meter (SSM) line, an ultrasonic meter for sizes 5/8 to 2 inches and HBMAG electromagnetic meter for sizes 4 and 8 inches. These meters are compatible with both AMR and AMI systems. Mueller's endpoints utilize large lithium batteries to warrant a 20 year life inside the meter endpoint. The endpoints are not integrated with the meters and come separately.

Kamstrup offers the FlowIQ 3200, an ultrasonic meter for sizes 5/8 to 4 inches and MAG 8000, an 8 inch electromagnetic meter. These meters are compatible with both AMR and AMI systems. Kamstrup's endpoints are integrated within the meters. Endpoints have Standard Kamstrup 20 year warranty (10 years full + 10 year prorated).

Neptune offers the T-10® displacement meter for sizes 5/8 to 2 inches and the MACH 10® ultrasonic meter for sizes 4 and 8 inches. These meters are compatible with both AMR and AMI systems. Neptune's endpoints are integrated within the meters. Endpoints have Standard Neptune 20 Year warranty (10 years full + 10 year prorated). A summary of the meters and data collection technologies from these suppliers are presented in Table 10.

Table 10: Technical Comparison of Meter Systems

Supplier	Selected Meters	Key Features of AMI/AMR Technology
Mueller	*Solid State Meter (SSM)* Ultrasonic meter for sizes 5/8" to 2" *HbMAG* Electromagnetic meter for sizes 4" and 8"	- Two AMI options: Long Range Wide Area Network (LoRaWAN) or traditional AMI (Mi.Net®) - Can use either CPUD's server or Mueller's server with Sentryx™ software - Standard warranty: 20 years - One Software for both AMR and AMI - Remote meter shut off/on capability - Leak detection - Cellular data transfer (without AMR/AMI)
Kamstrup	*FlowIQ 3200* Ultrasonic meter for sizes 5/8" to 4" *MAG 8000* Electromagnetic meter for size 8"	- One AMI option: Traditional (Kamstrup AMI) - Can only use Kamstrup server - One Software for both AMR and AMI - Standard warranty: 20 years (10 full/10 prorated) - Cellular data transfer (without AMR/AMI) - Leak detection
Neptune	*T 10* Displacement meter for sizes 5/8" to 2" *MACH 10* Ultrasonic meter for sizes 4" and 8"	- Two AMI options: LoRaWAN or traditional AMI (R900®) - Standard warranty: 20 years (10 full/10 prorated) - Can only use Neptune server - One software (Neptune 360) for both AMR and AMI - Cellular data transfer (without AMR/AMI) - Leak detection

The following sections include technical and cost analysis for three possible configurations for CPUD: Full AMR, Full AMI, and a hybrid system of AMI and AMR.

6.2 Full AMR System

With this system, CPUD personnel no longer need to read the meters manually. Instead, an endpoint is connected to the meter's register and captures water flow and alarm data which is then collected by CPUD personnel by walking or driving by with a data receiver

such as a handheld collector, laptop, or a smartphone, in proximity to the device. After collection, the meter data is uploaded to the CPUD database where CPUD personnel can monitor and analyze usage, troubleshoot issues, and bill customers. This can save time and labor for CPUD, therefore, reduce overall operational costs compared to the current system.

A lump sum cost for full AMR system from suppliers is presented in Table 11. Supplier quotations are presented in Appendix C. The cost estimate does not include installation, service line, and meter boxes costs.

Table 11: Full AMR System Cost

Supplier	Meters + AMR Devices	AMR Software (Annual)
Mueller	$448,500	$980
Kamstrup	$757,600	$2,250
Neptune	$562,200	$3,000

6.3 Full AMI System

AMI is the most advanced meter reading and data collection system currently available. It is an integrated system of water meters, communication networks, and data management systems that enables two way communication between meter endpoints and the system. Unlike AMR, AMI does not require CPUD personnel to collect the data. Instead, endpoints will transmit meter data automatically at a predetermined time once per day to AMI network fixed data collectors (gateways). On demand reads can also be requested anytime and are typically delivered within seconds. The data is then transmitted from the gateways to the host server and from there to CPUD's database for storage and analysis. With a full AMI system, CPUD's labor costs for onsite meter reading and data collection will approach to zero. In addition, it will save time and enhance billing process by being more efficient and on time.

The three suppliers offer the same meter and endpoint systems for AMI as for the AMR systems. Mueller and Neptune have two options for a full AMI system: traditional and LoRaWAN. LoRaWAN is a low power wide area communication network that wirelessly connects battery operated devices to the internet and manages communication between endpoints and system servers. LoRaWAN has many advantages over traditional AMI, including faster data transfer, longer range, low battery usage, and cheaper cost due to use of fewer gateways. Only Neptune provided a quotation and propagation study for both LoRaWAN and traditional AMI systems. The other two suppliers provided quotations

and propagation studies only for traditional AMI system because it is unknown if CPUD's service area has the necessary infrastructure for LoRaWAN. Therefore, CRWA used traditional AMI as the basis for technical and cost comparison between the suppliers. A lump sum cost for AMI system from all three suppliers is presented in Table 12. Supplier quotations are presented in Appendix C. The cost estimate does not include installation, service line, and meter boxes costs.

Table 12: Full AMI System Cost

Supplier	Meters + AMI Devices	AMI Software (Annual)
Mueller	$506,600	$15,800
Kamstrup	$1,275,100	$10,300
Neptune	$801,500	$18,700

6.4 Hybrid System of AMI and AMR

This system would use a combination of AMI and AMR technologies. Each supplier conducted a propagation study of CPUD's water system to determine the feasibility of AMR and AMI systems. The main goal of these studies was to identify parts of the system that are economically suitable for AMI. Areas like San Andreas and Mokelumne Hill that have more meters would have AMI technology; fully automated reading by using fixed antennas at optimal locations. This system would use one or more antennas to read all meters within a certain range. Meters in remote mountainous areas like Glencoe would be read with walk by or drive by (AMR).

The propagation studies from Mueller and Kamstrup show that around 95 percent of the system has good signal coverage for AMI system. While Neptune's study shows 66 percent covered by AMI and 34 percent covered by cellular technology. These are rough estimations and site studies are required to identify the areas and quantify the number of meters and antennas required for hybrid system. Supplier propagation studies are attached in Appendix B. A cost estimate for hybrid system is presented in Table 13. The cost estimate does not include installation, service line, and meter boxes costs.

Table 13: Hybrid AMI/AMR System Cost

Supplier	Hybrid AMR + AMI	Hybrid Software (Annual)
Mueller	$503,600	$15,800
Kamstrup	$1,249,300	$13,500
Neptune	$720,100	$14,100

6.5 Conclusion and Recommendations

For this analysis CRWA selected the apparent lowest cost supplier for each system. Mueller's AMR was selected as the best AMR system because it offers electromagnetic and ultrasonic meters and has the lowest cost. For the best AMI and hybrid systems, Mueller was selected because it offers the lowest cost AMI system without including cellular meters. Although Neptune has similar cost, it has included a high number of cellular meters in their proposal which will result in additional cellular data usage costs. As the meter project progresses through design, Neptune may be reconsidered as an option because they have a similar cost to Mueller and offered a more conservative estimate for this study. Despite offering similar features, Kamstrup was not selected because of very high costs compared to the other two suppliers.

A project net present value (NPV) for 20 years was calculated for the selected AMR, AMI, and hybrid systems. The NPVs are used to evaluate and compare both alternatives by estimating cost of each option over 20 years. NPVs take capital costs and operational costs into consideration and discount future expenses based on an assumed inflation rate. The NPVs for the project were calculated by using the capital costs for the two options and the annual O&M costs that would occur during a 20 year period. A conceptual level construction cost opinion and NPV estimate is included in Appendix D. A cost comparison between the meter reading and data collection systems, is presented in Table 14 below.

Table 14: Cost Comparison Between AMR, AMI, and Hybrid Systems

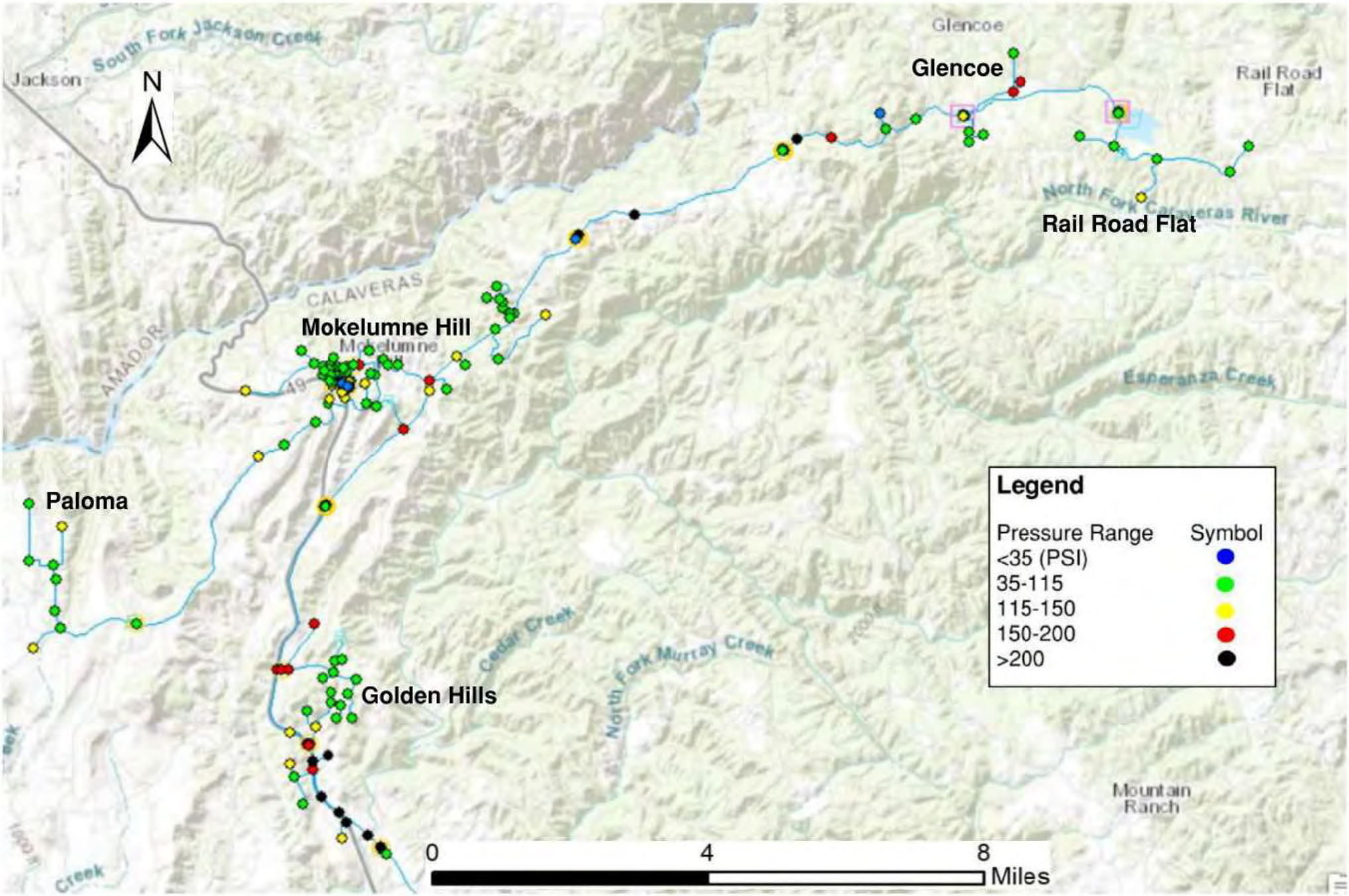
Lowest Cost Alternative	Initial Cost	20 Year O&M	20 Year NPV
AMR (Mueller)	$449,000	$744,000	$1,193,000
AMI (Mueller)	$507,000	$633,000	$1,140,000
Hybrid (Mueller)	$504,000	$789,000	$1,293,000

CRWA recommends a full AMI system for CPUD. Although AMR system has a much lower initial cost compared to full AMI it has a much higher O&M cost than an AMI system resulting in a similar 20 year NPV. In addition, AMI system does not require CPUD

personnel to collect the data, therefore, saves time and enhances the billing process. After 20 years when the meters and endpoints are being replaced, the AMI infrastructure such as antennas/gateways may not need to be replaced therefore could reduce meter replacement costs.

In addition to meters, old meter boxes need to be replaced with new standardized boxes. The new infrastructure would have an expected service life of approximately 40 years, but the transmitters and registers would need to be replaced in about 20 years when the batteries fail.

Appendix A


Glencoe
Glencoe
Rail Road Flat
Rail Road Flat
North Fork Calaveras River
Jackson
South Fork Jackson Creek
N
CALAVERAS
AMADOR
Mokelumne Hill
Mokelumne
Esperanza Creek
Paloma
Golden Hills
Cedar Creek
North Fork Murray Creek
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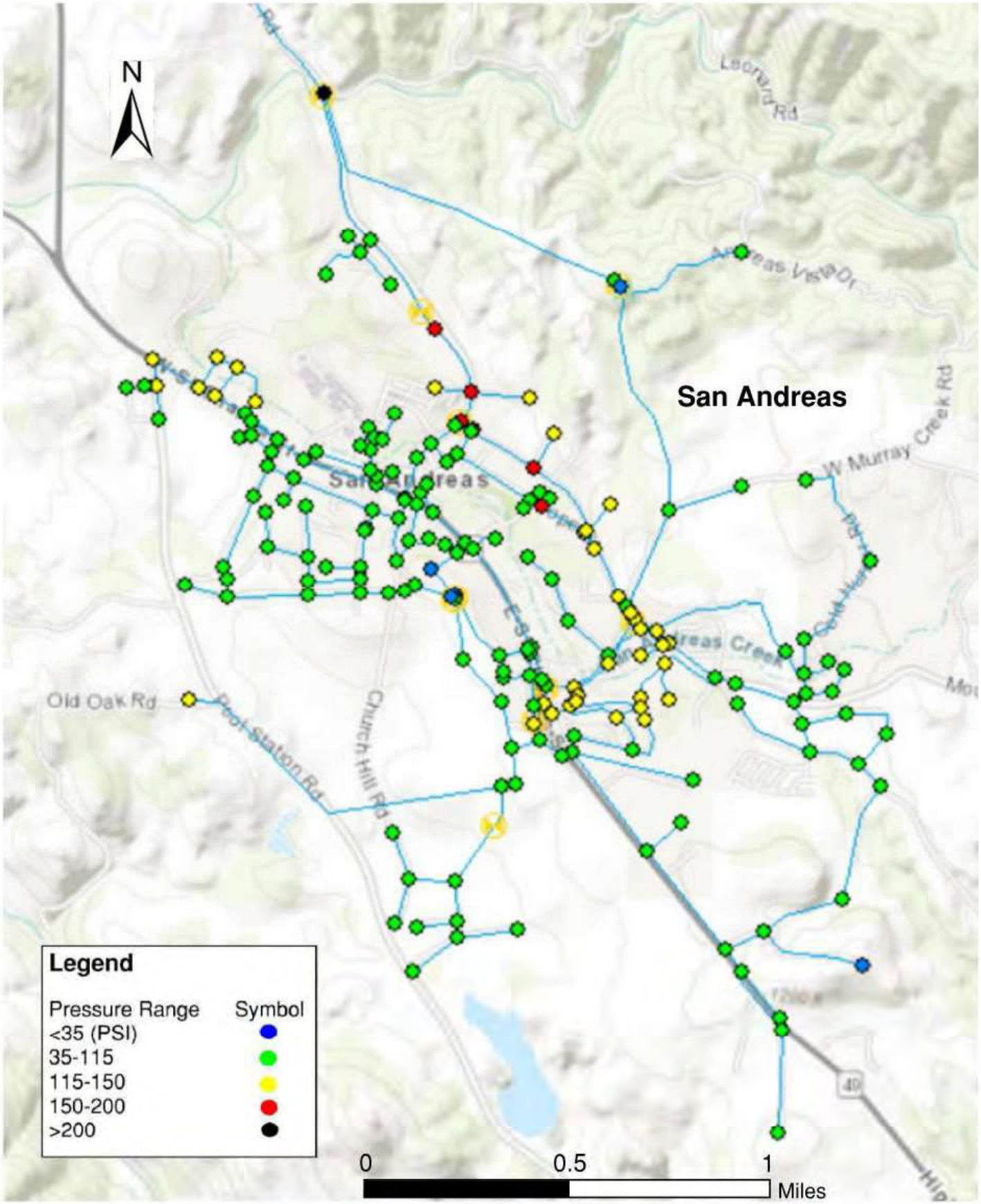
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San Andreas
Old Oak Rd
Pool Station Rd
Church Hill Rd
W Murray Creek Rd
Leonard Rd
Legend
Pressure Range
Symbol
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35-115
115-150
150-200
>200
0
0.5
1
Miles

Appendix B

Mueller Propagation Study

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Study Details

Available Information

- Water Tanks available in the service area
- Utility Properties available in the service area
- 1,936 Water Meters (100% Plastic Pit Lids)

Estimated Infrastructure Requirements

- Twelve (12) Multi-Network Collectors (on Water Tanks, Utility Properties and Proposed Locations)
- Two (2) ACXR Repeaters (on Utility Properties)
- Twenty-seven (27) DCXR Repeaters (on Sign Poles)

Assumptions

- 1,891 meter locations were able to be geocoded for this study. Additional meter locations provided after this study may require additional infrastructure.
- Study assumes water meters mounted under plastic pit lids. Nodes must be mounted through the lid with a Mueller TTLH adapter.
- Areas with low signal strength may require additional infrastructure.
- Assets proposed for infrastructure locations will require a site survey to determine any nearby assets/locations viable for infrastructure placement. After site survey, if there are no viable assets, study will need revision.
- Study assumes an average ambient RF noise floor at or below –115dBm within the Mi.Net operational frequency band. An RF spectrum analysis may be completed during the site survey. High in-band noise may require additional network infrastructure.
- **For asset assumptions see pages labeled 'Infrastructure Installation notes and assumptions'.**

Performance Goals

- RF Coverage of installed base of meter/modules to be at 100%
- Read rate of at least 98.5% over a 3-day window of the installed base of active meter/modules.

Note:

This RF propagation study was conducted using the available information and assumptions stated in this document. Quantities and infrastructure locations are subject to change after detailed site survey following award.

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Multi-Network Collector Locations

Type	Height Assumption	Asset Name	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Labor Part Number
MNC	30ft	Main Control Valve	38.323137	-120.655653	LABOR-COLLECTOR1
MNC	30ft	HWY 26 Tank	38.257704	-120.704873	LABOR-COLLECTOR5
MNC	30ft	Ponderosa Hydro Plant	38.337368	-120.612922	LABOR-COLLECTOR5
MNC	30ft	Railroad Flat Tank	38.336594	-120.542300	LABOR-COLLECTOR1
MNC	30ft	Mokelumne Hill Tank	38.296146	-120.694573	LABOR-COLLECTOR1
MNC	30ft	Poloma Tank	38.260219	-120.747989	LABOR-COLLECTOR1
MNC	30ft	San Andreas Tank	38.204038	-120.670326	LABOR-COLLECTOR1
MNC	30ft	Proposed Location 1	38.300244	-120.709519	LABOR-COLLECTOR7
MNC	30ft	Proposed Location 2	38.343340	-120.593008	LABOR-COLLECTOR7
MNC	30ft	Proposed Location 3	38.337435	-120.517081	LABOR-COLLECTOR7
MNC	30ft	Proposed Location 4	38.232141	-120.712531	LABOR-COLLECTOR7
MNC	30ft	Proposed Location 5	38.311621	-120.671622	LABOR-COLLECTOR7

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

XR Repeaters

Type	Height Assumption	Asset Name	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Labor Part Number
ACXR	30ft	Admin Office	38.200253	-120.690231	LABOR-REPEATER3
ACXR	30ft	PRV Cemetery	38.192472	-120.678674	LABOR-REPEATER3

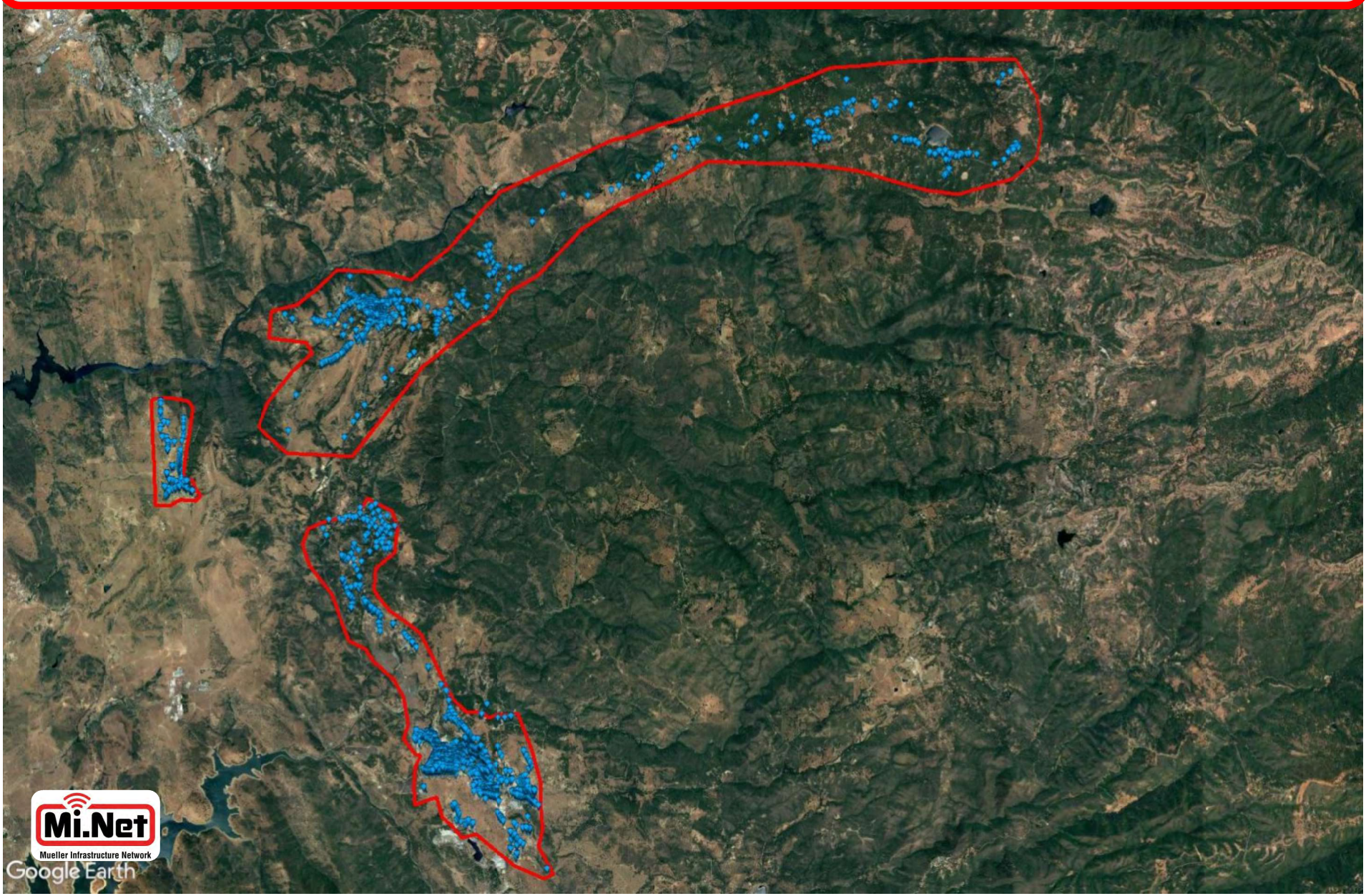
Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

XR Repeaters

Type	Height Assumption	Asset Name	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Labor Part Number
DCXR	10ft	Sign Pole 1	38.172598	-120.663232	LABOR-REPEATER1
DCXR	10ft	Sign Pole 2	38.336016	-120.531186	LABOR-REPEATER1
DCXR	10ft	Sign Pole 3	38.340262	-120.574529	LABOR-REPEATER1
DCXR	10ft	Sign Pole 4	38.345456	-120.570349	LABOR-REPEATER1
DCXR	10ft	Sign Pole 5	38.352500	-120.520771	LABOR-REPEATER1
DCXR	10ft	Sign Pole 6	38.338017	-120.595793	LABOR-REPEATER1
DCXR	10ft	Sign Pole 7	38.333003	-120.621334	LABOR-REPEATER1
DCXR	10ft	Sign Pole 8	38.327534	-120.636199	LABOR-REPEATER1
DCXR	10ft	Sign Pole 9	38.347975	-120.553171	LABOR-REPEATER1
DCXR	10ft	Sign Pole 10	38.309851	-120.663705	LABOR-REPEATER1
DCXR	10ft	Sign Pole 11	38.342607	-120.585306	LABOR-REPEATER1
DCXR	10ft	Sign Pole 12	38.327509	-120.648371	LABOR-REPEATER1
DCXR	10ft	Sign Pole 13	38.296941	-120.707201	LABOR-REPEATER1
DCXR	10ft	Sign Pole 14	38.179943	-120.664124	LABOR-REPEATER1
DCXR	10ft	Sign Pole 15	38.214535	-120.687852	LABOR-REPEATER1
DCXR	10ft	Sign Pole 16	38.192588	-120.687547	LABOR-REPEATER1
DCXR	10ft	Sign Pole 17	38.300097	-120.715813	LABOR-REPEATER1
DCXR	10ft	Sign Pole 18	38.207389	-120.683825	LABOR-REPEATER1
DCXR	10ft	Sign Pole 19	38.288791	-120.718030	LABOR-REPEATER1
DCXR	10ft	Sign Pole 20	38.275429	-120.711132	LABOR-REPEATER1

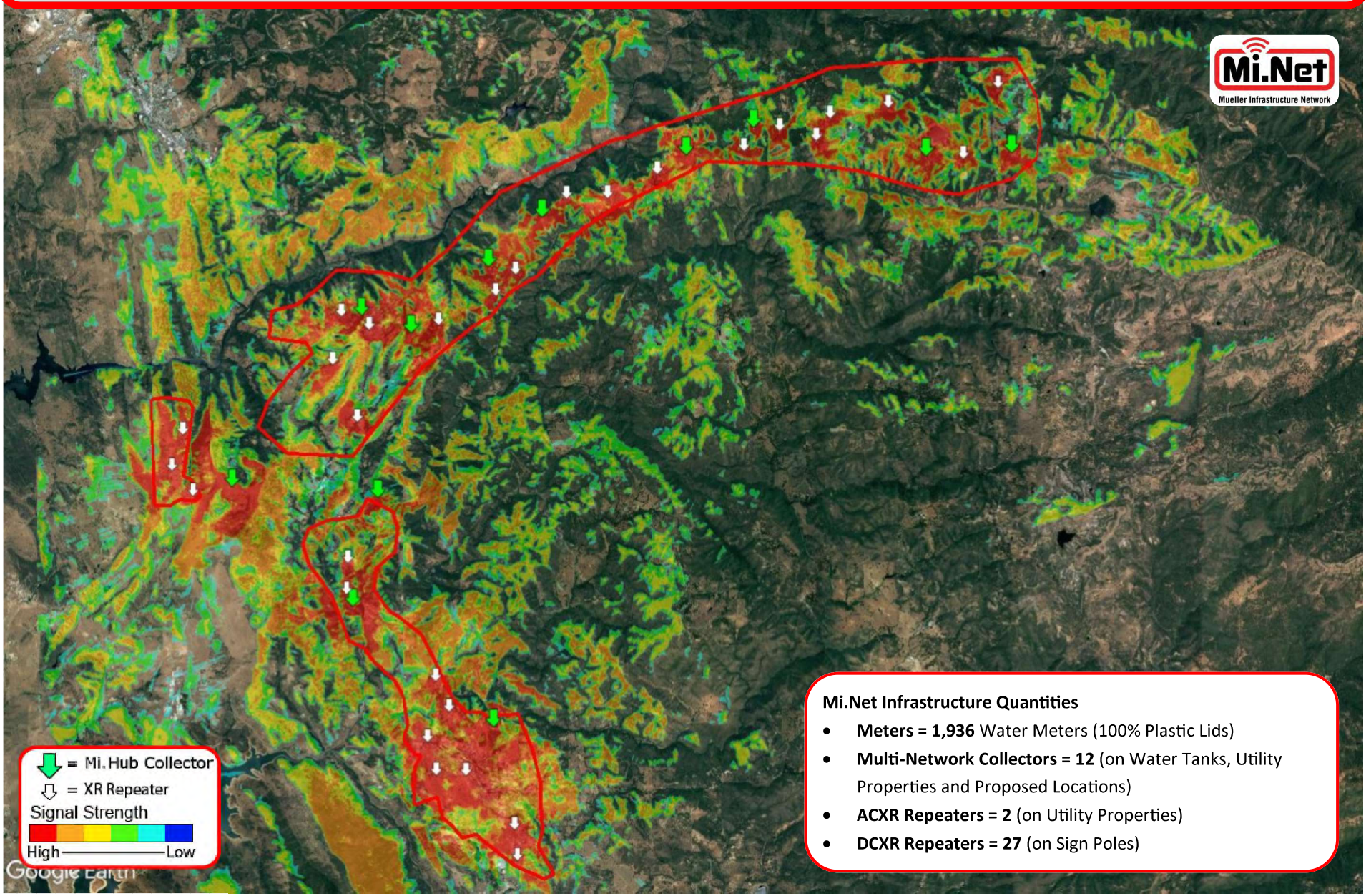
Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Estimated Service Area and Meter locations



Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Estimated RF Analysis Coverage



Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Infrastructure Installation Notes and Assumptions

Type/Part Numbers	Device	Notes/Assumptions
Tank <150': **LN: LABOR-COLLECTOR1** **PN:** MS-MNC-V4-AC-AT3 Tank >150': **LN: LABOR-COLLECTOR2** **PN:** MS-MNC-V4-AC-AT3	MNC/RMR/SMR on utility owned tank	Includes installation of antenna and amplifier/filter on top of tank to existing structure (i.e. corral or railing), running and securing coax from amplifier to collector on available raceway within arm's reach of ladder down the tank. Installation of the Collector at base of tank on utility supplied mounting panel or post, weather proofing all connections and RF sweep of connections. **a.** Assumes available AC source within close (3ft) range of the collectors installed site **b.** Assumes collector can be installed to an existing circuit or to an additional circuit breaker in an existing panel and that a good ground is provided or available for lightning arrestor **c.** Assumes suitable grounding point provided at top of structure, within 6ft of TTU installation location. *Does not include the following:* **d.** Other manual work not directly associated with installation of the Collector such as hand trenching from tank to Collector or electrical junction box and buildup of collector mounting frame **e.** Securing and encasing RF or AC cable in any form of conduit. **f.** Structural analysis or RF study of device with information provided by tower owner upon request, at cost plus 20%.

Mi.Net
Mueller Infrastructure Network

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Infrastructure Installation Notes and Assumptions

Type/Part Numbers	Device	Notes/Assumptions
Communication Tower <150': **LN: LABOR-COLLECTOR3** **PN:** MS-MNC-V4-AC-AT3 Communication Tower >150': **LN: LABOR-COLLECTOR4** **PN:** MS-MNC-V4-AC-AT3	MNC/RMR/SMR on communication tower	Includes installation of Antenna and Amplifier/filter on tower, running and securing coax from amplifier to collector down the tower. Installation of the Collector at base of tower on supplied mounting panel or post, weather proofing all connections, and RF sweep of connections. **a.** Assumes available AC source within close (3ft) range of the collectors installed site **b.** Assumes collector can be installed to an existing circuit or to an additional circuit breaker in an existing panel and that a good ground is provided or available for lightning protection at top of tower for TTU and bottom of tower for hub enclosure *Does not include other manual work not directly associated with installation of the Collector such as hand trenching from tank to Collector or electrical junction box and buildup of collector mounting frame.* **a.** Does not include monthly lease fees (approx. $200 to $500 per month). **b.** Structural analysis or RF study of device with information provided by tower owner upon request, at cost plus 20%. *Assumes MS will negotiate terms of rental agreement on behalf of utility. Utility will enter into agreement with tower owner.*

Mi.Net
Mueller Infrastructure Network

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Infrastructure Installation Notes and Assumptions

Type/Part Numbers	Device	Notes/Assumptions
Utility Asset **LN: LABOR-COLLECTOR5** **PN:** MS-MNC-V4-AC-AT3	MNC/RMR/SMR on Utility asset	Collector and MS provided hardware mounted to utility-provided asset at the height indicated in the prop study. Either bolted or clamped to building/pole provided with no additional mounting considerations using supplied mounting hardware. a. Assumes available AC source within close (3ft) range of the collectors installed site b. Assumes all parts of the installation can be accessed with a ladder and no man-lift required c. Assumes collector can be installed to an existing circuit or to an additional circuit breaker in an existing panel d. Structural analysis or RF study of device with information provided by asset owner upon request, at cost plus 20%.
Pole 25’ or Smaller: **LN: LABOR-COLLECTOR6** **PN:** MS-MNC-V4-AC-AT3 Pole 25.1’ to 55’: **LN: LABOR-COLLECTOR7** **PN:** MS-MNC-V4-AC-AT3	MNC/RMR/SMR with MS Supplied Pole	Includes selected non-telescopic and non-tilting pole provided by MS and labor to locate, set and install pole and collector by MS in utility approved right of way. **a.** Assumes available AC source within close (3ft) range of the collectors installed site **b.** Assumes collector can be installed to an existing circuit or to an additional circuit breaker in an existing panel -Hurricane rated poles or specialized installations priced separately in accordance with requirements. *Any right of way permitting provided by utility.*

Mi.Net
Mueller Infrastructure Network

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Infrastructure Installation Notes and Assumptions

Type/Part Numbers	Device	Notes/Assumptions
Utility Asset **LN: LABOR REPEATER 3** **PN: MSW-NODE4-AC**	ACXR on Utility Asset	Repeater and MS provided hardware mounted to utility-provided asset at the height indicated in the prop study. Either bolted or clamped to building/pole provided with no additional mounting considerations using supplied mounting hardware. **a.** Assumes available AC source within close (3ft) range of the repeater installed site **b.** Assumes all parts of the installation can be accessed with a ladder and no man-lift required **c.** Assumes repeater can be installed to an existing circuit or to an additional circuit breaker in an existing panel.
Pole set **LN: LABOR-REPEATER1** **PN: MSW-NODE4-DC**	DCXR with Pole set	Includes 10’ street sign typepost provided by MS and labor to locate and set post, and install repeater by MS in utility approved right of way. *Any right of way permitting provided by utility.*
Utility Asset **LN: LABOR-REPEATER2** **PN: MSW-NODE4-DC**	DCXR on Utility Asset	Repeater and MS provided hardware mounted to utility provided asset (i.e. street sign type post). Either bolted or clamped to asset provided with no additional mounting considerations using supplied mounting hardware.

Mi.Net
Mueller Infrastructure Network

Calaveras Public Utility District (CA) - Mi.Net V6 Propagation Study

Customer Signature Approval

Customer Approval

By: _____
Authorized Signature

_____
Name (Print or Type)

_____
Title

Mi.Net
Mueller Infrastructure Network

Kamstrup Propagation Study

kamstrup

Propagation Study

Calavera County PUD, CA

Consultant/Radio Planner	KRB
Date	06/21/2022
Version	01.00
Approver	JDM

Facts

No. of Meters: 2000 meters

Meter location: pit with concrete lids

Performance: 98.5% hourly readings

Extra info:

Conditions

The following situations are not included in the measured performance:

- Failure of third-party communications (e.g. GSM network or IP infrastructure)
- Defective meters or collectors
- Meters or collectors that have been affected by external factors (e.g. vandalism, physical harm or enclosure)
- Installations that are not performed or not possible to perform in accordance with the installation instructions and training of the vendor.
- The sites should be established within 50 meters of the specified locations. Alternative locations need approval by Kamstrup.
- Antenna must be placed at minimum the specified height (above ground) and free from surrounding roofs and structures.

Service Area

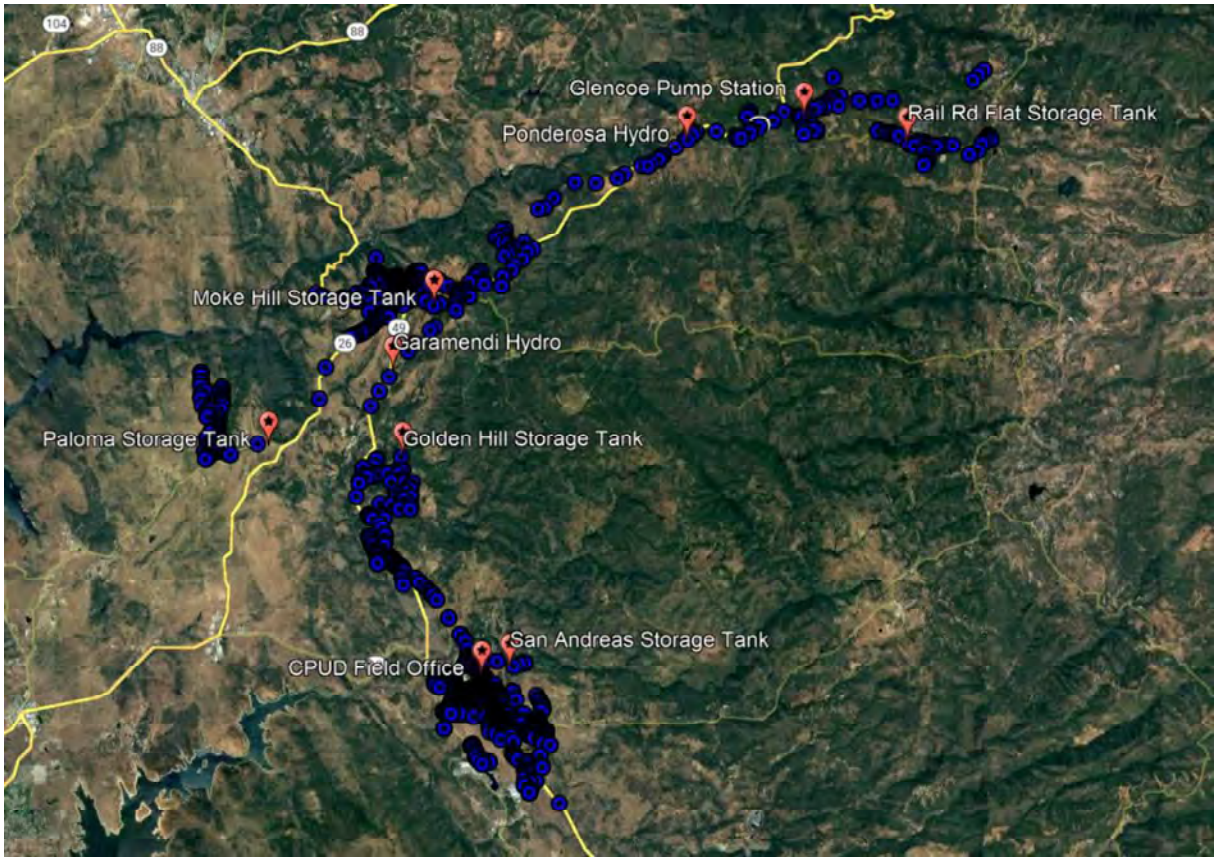


Figure 1 Service area and vertical assets

Site placement & Radio cover

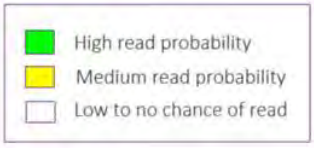
Assets

Asset Description	Address	Min. antenna height
Rail Rd Flat Storage Tank	38.336605°, -120.542315°	40ft
Glencoe Pump Station	38.343019°, -120.575299°	30ft
Ponderosa Hydro	38.337373°, -120.612925°	30ft
Moke Hill Storage Tank	38.296077°, -120.694441°	40ft
Paloma Storage Tank	38.260224°, -120.747996°	36ft
Garamendi Hydro	38.279425°, -120.708065°	30ft
Golden Hill Storage Tank	38.257701°, -120.704874°	40ft
San Andreas Storage Tank	38.203890°, -120.670278°	40ft
CPUD Field Office	38.202076°, -120.679341°	30ft

Table 1 Vertical Assets Data

Study results

When analyzing the scenarios presented in this section, refer to the legend below:

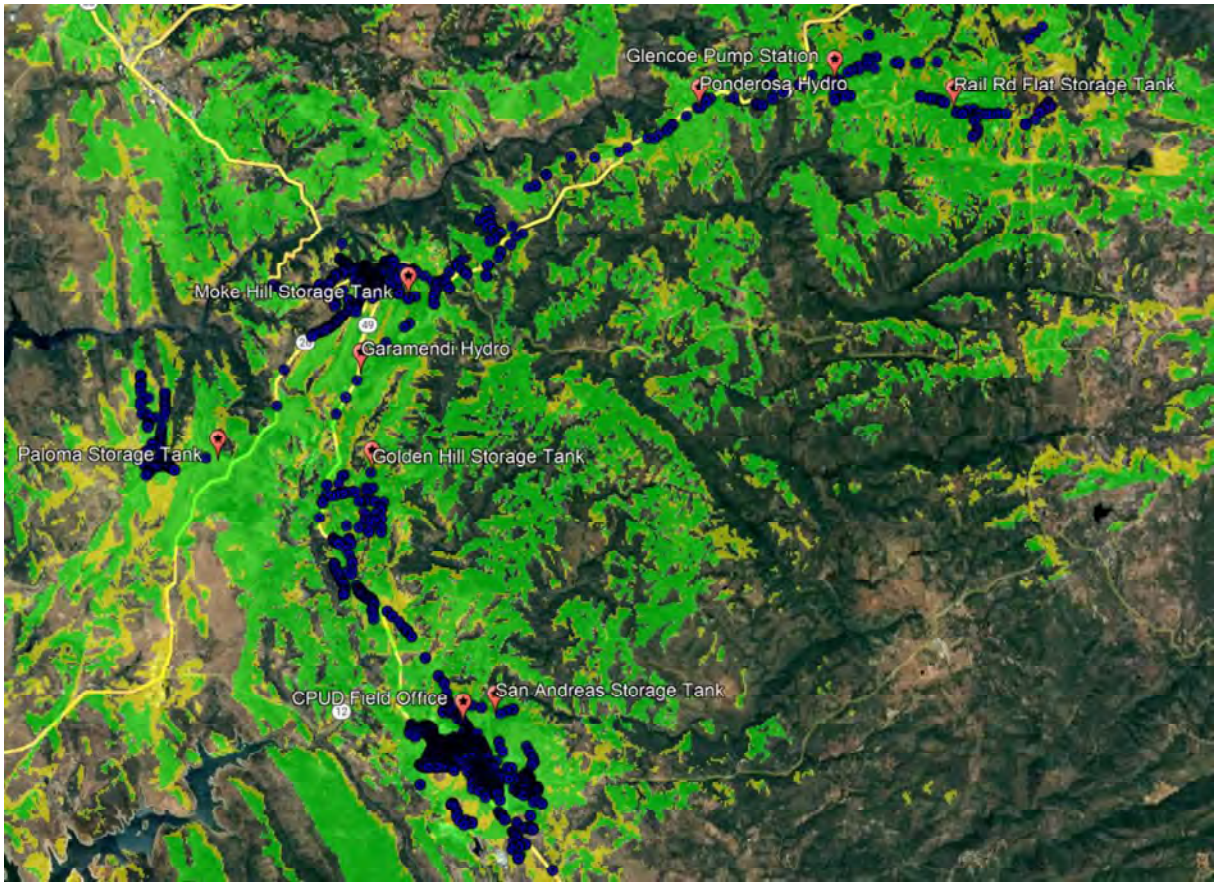


High Read Probability: Highlighted Green on the Map – very likely to receive daily reads from meter

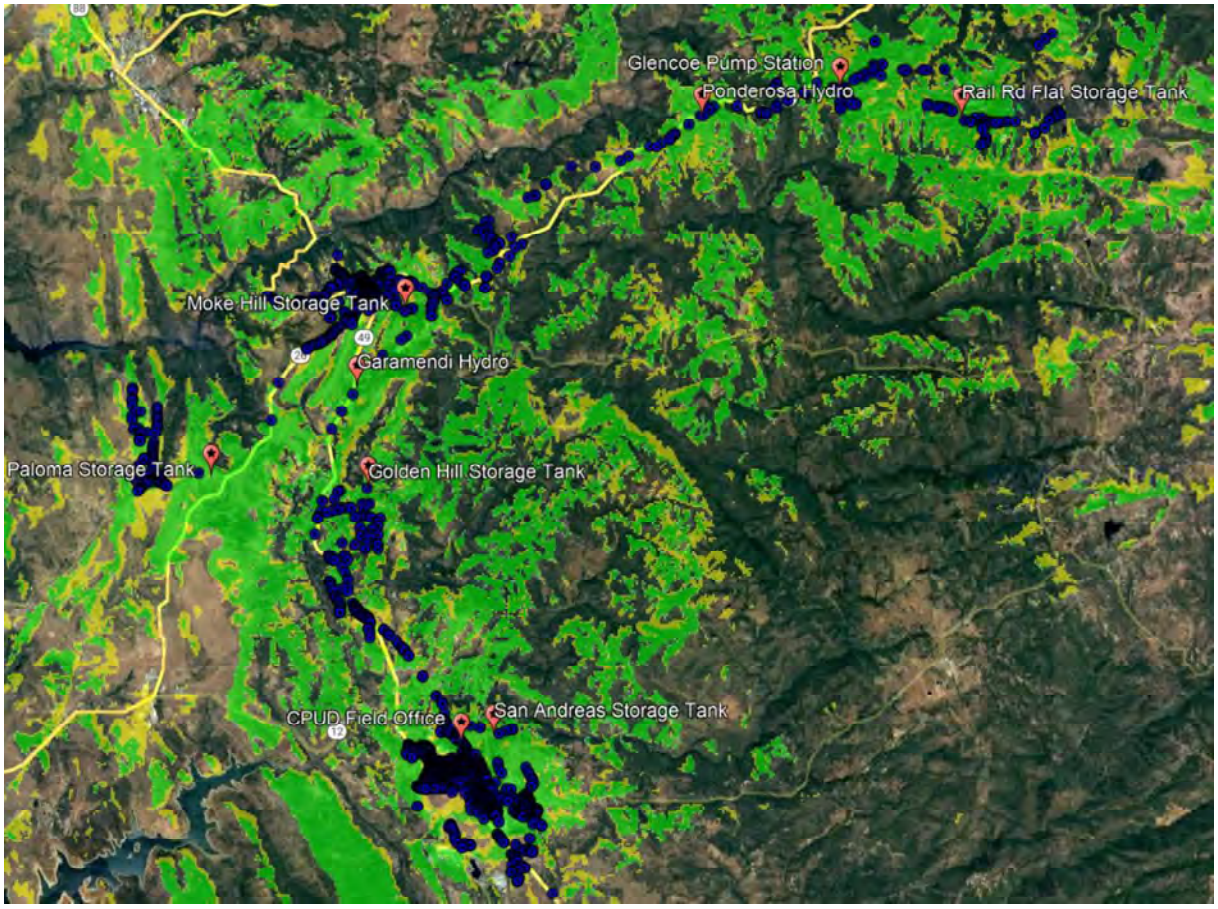
Medium Read Probability: Highlighted Yellow on the map – likely to receive reads every other day to every seven days

Low read Probability: No highlighting shown on map – likely to not have radio signal coverage from collector

Coverage - dry pit with polymer lids



Coverage - dry pit with concrete lids



Results of the propagation study

The service area is in an area with hills. With the provided 11 vertical assets, it is recommended to install collectors on 9. As the exact height of the vertical assets are unknown, the heights used are estimates.

There are approximately 5% of the meters outside coverage.

Budget with 9 collectors and 10% external meter antennas or swap pit lid polymer.

Neptune Propagation Study

R900 Propagation Analysis

Calaveras Public Utilities District- San Andres, CA

July 1st, 2022

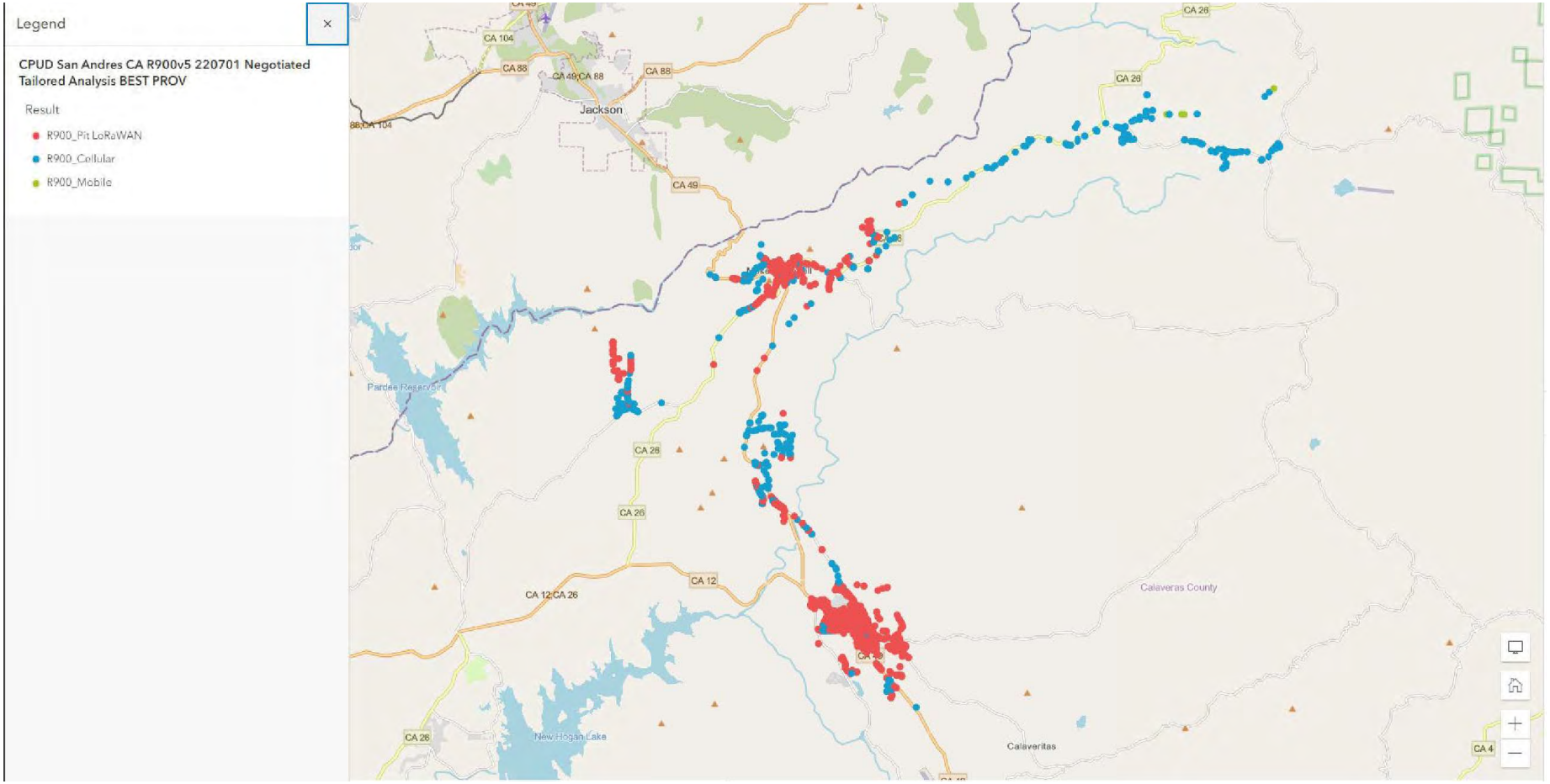
NEPTUNE TECHNOLOGY GROUP

Predicted Coverage Results:

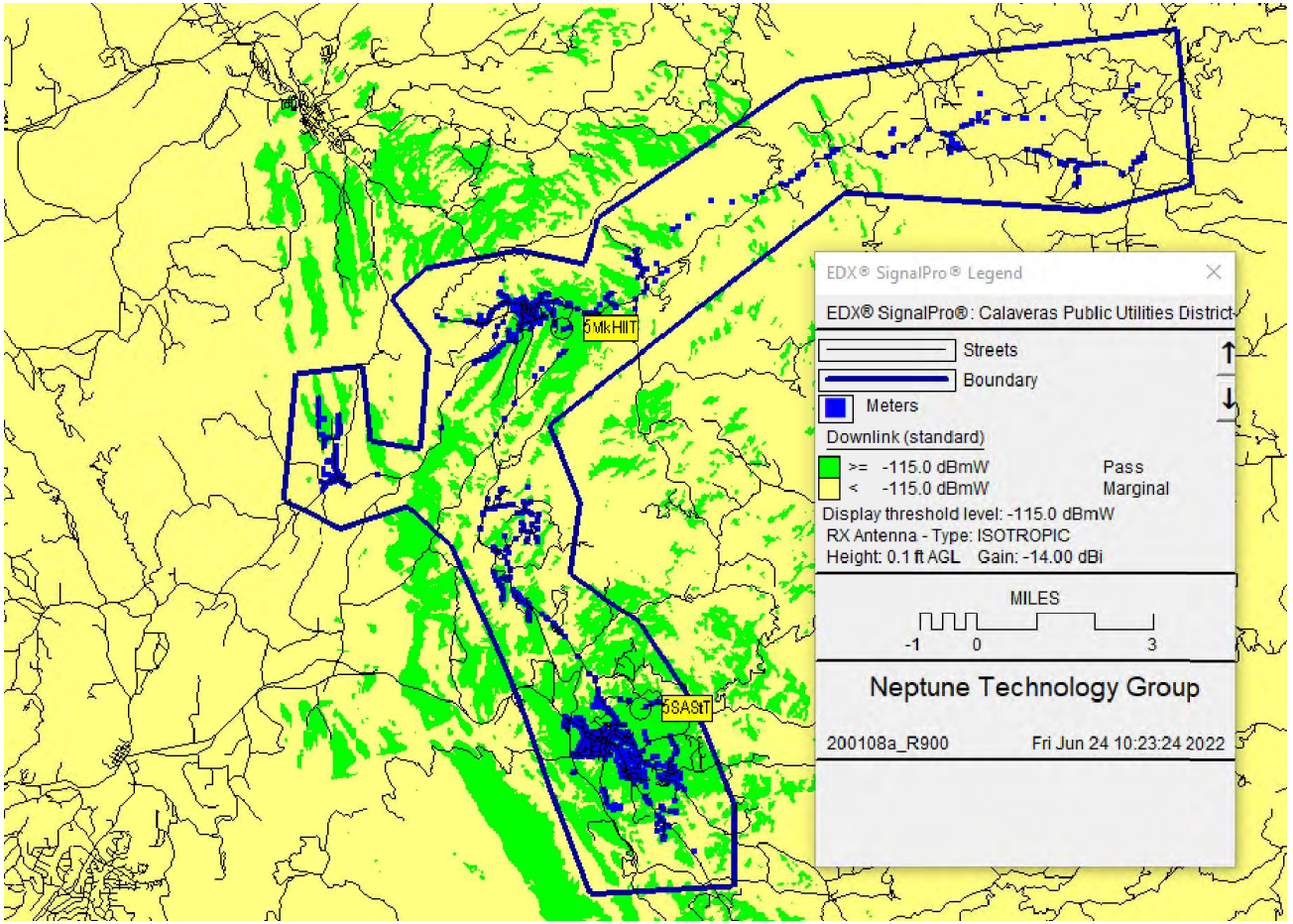
Coverage	# Services	% Services
R900_v5 Pit LoRaWAN	1449	75.51%
R900_Cellular	466	24.28%
R900_Mobile	4	0.21%
NonGeo	0	0.00%
Totals	1919	100.00%

Map	Description	Provided Services		1,919	Geocoded Services	1,919	Area (sq Miles)	57.48
		#Coll	MIU Type	Read Type	Projected	% Projected	Projected	% Projected
2	Best Provided	2	R900v5 Pit	Billing	1,449	75.50%	15.05	26.18%

Map 1: Tailored Coverage



Map 2: R900 Gateway Coverage



Gateway Locations:

Map	Location	Latitude	Longitude	Collector	Elev(m)	AntHgt(m)	Elev(ft)	AntHgt(ft)	Coax Type	Coax(ft)	Antenna
1	5SAStT	38.203889	-120.670278	Tmega	405	12	1328	40	LMR400	15	2xMFB9155
1	5MkHllT	38.296111	-120.694444	Tmega	556	12	1823	40	LMR400	15	2xMFB9155

Assumptions:

1. Propagation based on defined MIU (External Wall or Pit w/External Antenna) with specified gateway/collector. Older equipment should be replaced. Propagation is subject to change based on equipment specifications and performance. Performance cannot be confirmed until final system evaluation and analysis complete. Propagation model is based on performance for >90% daily read success and typical noise level <-120dBm. Use of this propagation analysis done with this understanding and there is no guarantee of product or performance. Additional gateways could be required. Antenna heights are set to 75 feet as default unless heights provided. This affects Find (search ring) and asset locations.

2. MIUs mounted inside structures not recommended for fixed network solutions. Various building materials used within structures affect RF signal differently. An average loss value applied to the propagation model for inside MIU studies. Relocate non-performing inside MIUs to structure exterior. Inside R900i MIUs not recommended for fixed network solutions and may require replacement with External Wall MIU.

3. Check FAA; ASR; and AM Tower Screening results to identify potential work by owner or contractor. FAA obstruction evaluation based on proximity to airports. https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm ; Check ASR (Antenna Structure Registration) requirements at http://wireless.fcc.gov/antenna/index.htm?job=home ; Check AM Tower screening results for structures within 3km of AM stations; LBA Group (https://www.lbagroup.com/client-portal/index.php) & Sitesafe (http://am.sitesafe.com/) offer free evaluations and proposals for engineered solutions for AM detuning.

4. Coverage is not based on MIU specifications. Contains AT&T Proprietary and Confidential information – use only pursuant to company direction. Coverage and signal levels are based on stationary on-air outdoor predictions and are not guaranteed. Actual coverage may differ and may be affected by terrain; weather; foliage; buildings; other construction; high-usage periods; customer equipment; and other factors. Indoor uses would be worse depending on the building construction. Signal levels do not equate to speed. LTE Tri-Level Ranges: Best = 0 to -100; Good = -100 to -110 Moderate = -110 to -116. Tri-level coverage is the most detailed signal level information we are allowed to share with customers. The tri-level breakout is signal strength estimates output by the RAN design tools for the various technologies and merge them into three bands. The band breakouts were selected by HQ RAN engineers to represent what level of service customers would likely have outside (remember all our estimates are for outside coverage not in-building) in an area or at an address.

R900 Propagation Analysis

Calaveras Public Utilities District- San Andres, CA

July 1st, 2022

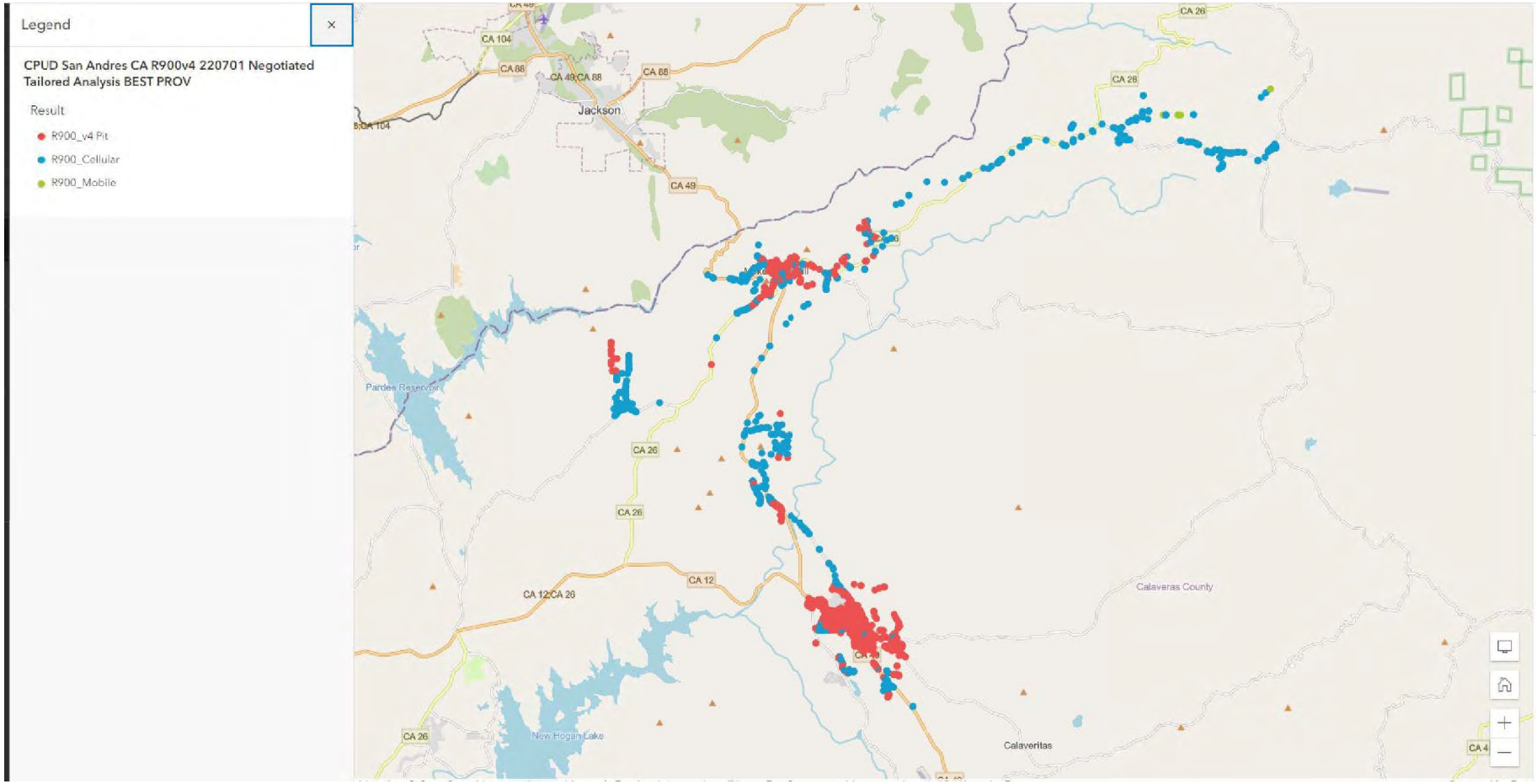
NEPTUNE TECHNOLOGY GROUP

Predicted Coverage Results:

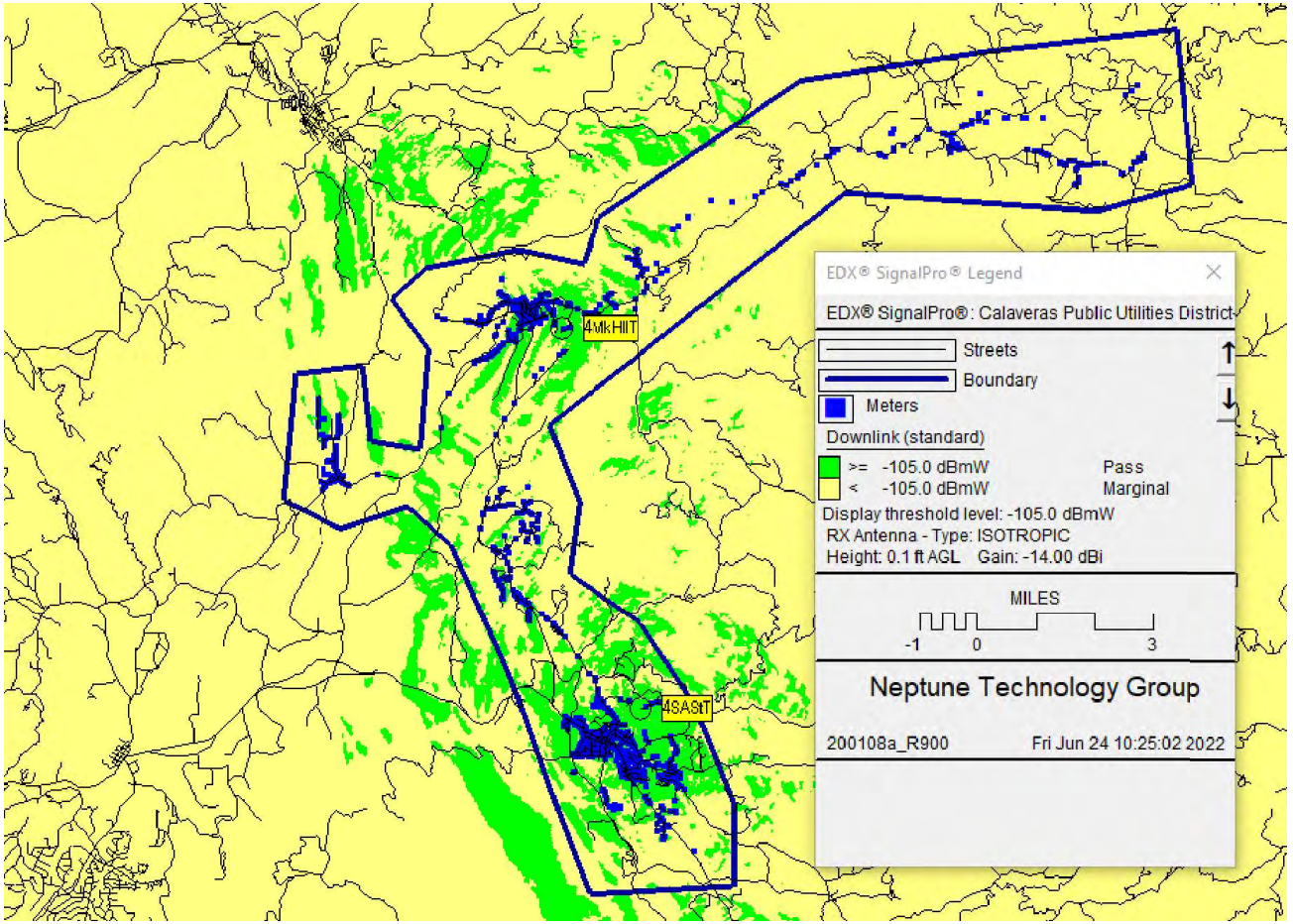
Coverage	# Services	% Services
R900_v4 Pit	1272	66.28%
R900_Cellular	643	33.51%
R900_Mobile	4	0.21%
NonGeo	0	0.00%
Totals	1919	100.00%

Map	Description	Provided Services		1,919	Geocoded Services	1,919	Area (sq Miles)	57.48
		#Coll	MIU Type	Read Type	Projected	% Projected	Projected	% Projected
2	Best Provided	2	R900v4 Pit	Billing	1,272	66.28%	10.46	18.20%

Map 1: Tailored Coverage



Map 2: R900 Gateway Coverage



Gateway Locations:

Map	Location	Latitude	Longitude	Collector	Elev(m)	AntHgt(m)	Elev(ft)	AntHgt(ft)	Coax Type	Coax(ft)	Antenna
1	4MkHllT	38.296111	-120.694444	GPV4	556	12	1823	40	LDF4	90	MFB9155
1	4SAStT	38.203889	-120.670278	GPV4	405	12	1328	40	LDF4	90	MFB9155

Assumptions:

1. Propagation based on defined MIU (External Wall or Pit w/External Antenna) with specified gateway/collector. Older equipment should be replaced. Propagation is subject to change based on equipment specifications and performance. Performance cannot be confirmed until final system evaluation and analysis complete. Propagation model is based on performance for >90% daily read success and typical noise level <-120dBm. Use of this propagation analysis done with this understanding and there is no guarantee of product or performance. Additional gateways could be required. Antenna heights are set to 75 feet as default unless heights provided. This affects Find (search ring) and asset locations.

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3. Check FAA; ASR; and AM Tower Screening results to identify potential work by owner or contractor. FAA obstruction evaluation based on proximity to airports. https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm ; Check ASR (Antenna Structure Registration) requirements at http://wireless.fcc.gov/antenna/index.htm?job=home ; Check AM Tower screening results for structures within 3km of AM stations; LBA Group (https://www.lbagroup.com/client-portal/index.php) & Sitesafe (http://am.sitesafe.com/) offer free evaluations and proposals for engineered solutions for AM detuning.

4. Coverage is not based on MIU specifications. Contains AT&T Proprietary and Confidential information – use only pursuant to company direction. Coverage and signal levels are based on stationary on-air outdoor predictions and are not guaranteed. Actual coverage may differ and may be affected by terrain; weather; foliage; buildings; other construction; high-usage periods; customer equipment; and other factors. Indoor uses would be worse depending on the building construction. Signal levels do not equate to speed. LTE Tri-Level Ranges: Best = 0 to -100; Good = -100 to -110 Moderate = -110 to -116. Tri-level coverage is the most detailed signal level information we are allowed to share with customers. The tri-level breakout is signal strength estimates output by the RAN design tools for the various technologies and merge them into three bands. The band breakouts were selected by HQ RAN engineers to represent what level of service customers would likely have outside (remember all our estimates are for outside coverage not in-building) in an area or at an address.

Appendix C

Mueller Quotation

MUELLER

SALES QUOTATION

Phone: (800) 423-1323
Website: www.MuellerSystems.com

Attention: Travis Small
Phone: (209) 754-9442
Email: travis.small@cpud.org

Company Address:
506 West Saint Charles Street
San Andreas,CA,95249

Prepared For:
CALAVERAS PUBLIC UTILITY DISTRICT (CA)
Account #:

End User:
CALAVERAS PUBLIC UTILITY DISTRICT (CA)

Created Date: 06/16/2022
Quote #: Q-107629
Quote Expires: 06/15/2022

Terms are located at:
www.MuellerSystems.com/Support

ARO: "A" & Stock items 30 Days.
Project items Stock to 120 days unless specified in contract

Currency Type: USD

Prepared by:
Daniel Whittemore

Comments & Consideration

$50 minimum order, $75 non-box quantity
Should you have any questions, please do not hesitate to contact Daniel-Whittemore

Quote Line Items

Mueller AMI Quotation

AMI Devices (One Time Costs)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MSW-NODE4-AC	AC REPEATER	2	1,260.00	2,520.00
MSW-NODE4-DC	DC REPEATER	27	1,030.00	27,810.00
MS-TTL-A	THRU THE LID ANTENNA ASSEMBLY	2,000	5.00	10,000.00
MSW-NODE6-1P-05	RADIO ENDPOINT	2,000	82.00	164,000.00
MS-MNC-V4-AC-AT1	COLLECTOR	12	9,600.00	115,200.00
MS-H4-RADIO	INSTALL RADIO	1	2,250.00	2,250.00
MS-G-MHUB	MAINTENANCE RADIO	1	2,800.00	2,800.00
			AMI Devices (One Time Costs) TOTAL:	USD 324,580.00

Mueller AMI Quotation

AMI Labor Install

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
LABOR-COLLECTOR5	COLLECTOR INSTALLTION ON UTILITY ASSET	7	3,055.20	21,386.40
LABOR-COLLECTOR7	MUELLER SUPPLIED POLE AND COLLECTOR INSTALL LABOR	5	7,316.40	36,582.00
LABOR-REPEATER1	DC (BATTERY POWERED) REPEATER WITH A SIGN POST	2	1,303.15	2,606.30
LABOR-REPEATER3	DC (BATTERY POWERED) REPEATER ATTACHED TO EXISTING ASSET	27	3,055.20	82,490.40
			AMI Labor Install TOTAL:	USD 143,065.10

AMI Software (Annual Cost)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MS-CELLULAR	4G CELLULAR BACKHAUL PER MNC COLLECTOR	12	401.22	4,814.64
MSW-S-PH-ALL-5K	SaaS SENTRYX AMI SOFTWARE (HES/ MDMS)	2,000	5.50	11,000.00
			AMI Software (Annual Cost) TOTAL:	USD 15,814.64

Project Costs (One Time Cost)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MS-T-TRAIN-DAY	SOFTWARE TRAINING - PER DAY	3	3,000.00	9,000.00
MS-T-CIS-FILE	CIS FILE INTERFACE DEVELOPMENT (METER SWAP/ AND BILLING FILE) BETWEEN SENTRYX AND CIS SYSTEM	1	12,000.00	12,000.00
PROJECT-MGMT	PROJECT MANAGEMENT FEES AND MOBILIZATION	265	200.00	53,000.00
			Project Costs (One Time Cost) TOTAL:	USD 74,000.00

AMI Hardware (Optional Annual Cost) EXTENDED WARRANTY

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MS-G-M-YR	MNC COLLECTOR EXTENDED WARRANTY	12	2,530.37	30,364.44
MS-G-M-YR-MHUB	MAINTENANCE RADIO EXTENDED WARRANTY	1	502.44	502.44

Mueller AMI Quotation

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MS-R-M-YR	REPEATER EXTENDED WARRANTY	29	463.73	13,448.17
			AMI Hardware (Optional Annual Cost) TOTAL:	USD 44,315.05

Meters PD Nutating Disk Positive Displacement All Bronze Meters

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
VEGB123N	5/8X3/4,420B,BB,ME8,CF,5'NIC	1,700	115.00	195,500.00
VEKB123N	1"452B,BB,ME8,CF,5'NICOR	250	170.00	42,500.00
WENB123N	1-1/2" 562B,2B,ME8,SG,5'NICOR	20	500.00	10,000.00
WEPB123N	2"572B,2B,ME8,SG,5'NICOR	35	560.00	19,600.00
			Meters PD TOTAL:	USD 267,600.00

Meters SSM Ultrasonic Meter Option

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
U0303N	5/8X3/4 AQUAIENT ULTRASONIC METER-METAL ALLOY NSF62 COMPLIANT	300	126.00	37,800.00
S0410EN	SSM3/4STD,CF.01V,8E,EXTPR 18"N	1,400	115.00	161,000.00
S0510EN	SSM 1",CF,.01V,8E,EXT PRO 18"N	250	186.00	46,500.00
			Meters SSM TOTAL:	USD 245,300.00

Meter Lids (Optional) Estimated until actual box types are provided

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
XXXXXX	B-24 Box Lid	2,011	130.99	263,420.89
			Meter Lids (Optional) Estimated until actual box types are provided TOTAL:	USD 263,420.89

SALES QUOTATION

Phone: (800) 423-1323
Website: www.MuellerSystems.com

Attention:
Phone:
Email:

Company Address:
506 West Saint Charles Street
San Andreas,CA,95249

Prepared For:
CALAVERAS PUBLIC UTILITY DISTRICT
(CA)
Account #:

End User:
CALAVERAS PUBLIC UTILITY DISTRICT
(CA)

Created Date: 05/09/2022
Quote #: Q-105388
Quote Expires: 07/20/2022

Terms are located at:
www.MuellerSystems.com/Support

ARO: "A" & Stock items 30 Days.
Project items Stock to 120 days
unless specified in contract

Currency Type: USD

Prepared by:
Daniel Whittemore

Comments & Consideration
$50 minimum order, $75 non-box quantity
Should you have any questions, please do not hesitate to contact Daniel-Whittemore
Quote Line Items

Mueller AMR Quotation

AMR Devices (One Time Cost)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MSW-NODE5-1P-05	MINET-M W/5'NICOR	2,011	75.00	150,825.00
MS-MNMMOBILE-HW-KIT	MINETM MOBILE TRANSCEIVER KIT	1	7,500.00	7,500.00
			AMR Devices (One Time Cost) TOTAL:	USD 158,325.00

AMR Software (One Time Cost)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
AHRMOBILE-SW-SUITE	EZREADER MOBILE SOFTWARE SUITE	1	700.00	700.00
			AMR Software (One Time Cost) TOTAL:	USD 700.00

Mueller AMR Quotation

Meters SSM Ultrasonic

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
U0303N	5/8X3/4 AQUAIENT 5' NICOR	1,700	125.00	212,500.00
S0510SN	SSM 1",CF,.01V,8E,STD PRO 18"N	250	0.00	0.00
S0610SN	SSM 1.5,CF,.01V,8E,STDPRO 18"N	20	0.00	0.00
S0710SN	SSM 2",CF,.01V,8E,STD PRO 18"N	35	0.00	0.00
			Meters SSM Ultrasonic TOTAL:	USD 212,500.00

Meters Positive Displacement

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
VEGB123N	5/8X3/4,420B,BB,ME8,CF,5'NIC	1,700	115.00	195,500.00
VEKB123N	1"452B,BB,ME8,CF,5'NICOR	250	170.00	42,500.00
WENB113N	1-1/2" 562B,2B,ME8,CF,5'NICOR	20	500.00	10,000.00
WEPB113N	2"572B,2B,ME8,CF,5'NICOR	35	560.00	19,600.00
			Meters Positive Displacement TOTAL:	USD 267,600.00

Large Meters

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
M0031F125	3"MAG,FM,CF,COMP,4D BAT,25'NIC	1	2,300.00	2,300.00
HBRING3	3" HBMAG GROUNDING RING	1	20.00	20.00
M0042F125	4"HBMAG,FM,SG,COM,4DBAT,25'NIC	5	2,650.00	13,250.00
HBRING4	4" HBMAG GROUNDING RING	10	25.00	250.00
M0081F125	8"MAG,FM,CF,COMP,4D BAT,25'NIC	1	6,000.00	6,000.00
HBRING8	8" HBMAG GROUNDING RING	2	33.00	66.00
			Large Meters TOTAL:	USD 21,886.00

AMR Software Maintenance (Optional Annual Cost)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
IAEZMAINT-SW-3K	EZ YR MAINT (1-2.5K)	1	980.00	980.00
			AMR Software Maintenance (Optional Annual Cost) TOTAL:	USD 980.00

Mueller AMR Quotation

AMR Hardware Maintenance (Optional Annual Cost)

PART #	DESCRIPTION	UNITS	SALE PRICE	EXTENDED NET
MS-MNMMAINT-TRANSCVER	MOBILE TRANSCEIVER YRLY MAINT	1	1,800.00	1,800.00
			AMR Hardware Maintenance (Optional Annual Cost) TOTAL:	USD 1,800.00

Kamstrup Quotation

Bid Proposal for Calaveras PUD, CA Metering Quote

CUSTOMER

All Bidders

Job
Calaveras PUD, CA Metering Quote
Bid Date: 07/29/2022
Bid #: 2418604

CONTACT

Sales Representative
Christopher Mensinga
(M) 585-831-2053
(T) 585-424-5800
(F) 585-424-7275
Chris.Mensinga@coreandmain.com

Core & Main
1268 Vanderbilt Circle
Manteca, CA 95337
(T) 209-823-7500

NOTES

Pricing is based on July 1st pricing. Two quotes have been provided, the first is the AMR (Drive-by) and the second is the AMI (Fixed base).

Bid Proposal for Calaveras PUD, CA Metering Quote

All Bidders
Bid Date: 07/29/2022
Core & Main 2418604

Kamstrup AMR Quotation

Core & Main
1268 Vanderbilt Circle
Manteca, CA 95337
Phone: 209-823-7500

Seq#	Qty	Description	Units	Price	Ext Price
		DUE TO CURRENT SUPPLY CHAIN DISRUPTIONS, MATERIALS			
		ARE SUBJECT TO PRICING AT TIME OF SHIPMENT. MATERIAL			
		AVAILABILITY AND TIMELINESS OF SHIPMENTS CANNOT BE			
		GUARANTEED. THIS TERM SUPERSEDES ALL OTHER			
		CONTRACTUAL PROVISIONS.			
10		**** DRIVE-BY AMR SOLUTION ****			
20	1700	5/8X3/4 FLOWIQ 2100 AMR MTR COMPOSITE	EA	273.60	465,120.00
		PART #: 02U-57-C04-8UX			
40	250	1" FLOWIQ 3101 AMR MTR SS	EA	589.50	147,375.00
		PART #: 03U-57-C0Q-8UX			
60	20	1-1/2" FLOWIQ 3101 AMR MTR SS	EA	1,061.11	21,222.20
		PART #:03U-23-C0J-8EX			
80	35	2" FLOWIQ 3101 AMR MTR SS	EA	1,629.00	57,015.00
		17"LL, PART #: 03U-23-C0K-8EX			
100	5	4" FLOWIQ 3101 AMR MTR SS	EA	3,650.40	18,252.00
		14"LL, PART #: 03U-23-C0N-8EX			
120	1	8" MAG8000 METER W/ GROUNDING	EA	7,334.00	7,334.00
		RINGS & READY GATEWAY			
140	350	AMR ANTENNA F/ FLOWIQ 2100 PLUG-IN	EA	39.00	13,650.00
150	350	KIT FOR WALL/PIT ANTENNA FLOWIQ 2200	EA	46.00	16,100.00
160		**** SOFTWARE / EQUIPMENT ****			
170	1	KAMSTRUP READY ADVANCED US CONVERTER 669640000.2	EA	3,490.72	3,490.72
180	1	ANDROID TABLET	EA	550.00	550.00
190	1	ANNUAL HOSTING FEES <2,400 PTS	EA	2,254.00	2,254.00
200		**** ONE TIME FEES ****			
210	1	SOFTWARE SET UP & INTEGRATION	EA	3,490.72	3,490.72
220	1	SOFTWARE TRAINING	EA	4,000.00	4,000.00
				DRIVE-BY AMR SOLUTION	**759,853.64**

Kamstrup AM Quotation

Bid Proposal for Calaveras PUD, CA Metering Quote

Bid #: 2418604

Seq#	Qty	Description	Units	Price	Ext Price
240		**** AMI FIXED BASE SOLUTION ****			
250	1700	5/8X3/4 FLOWIQ 2200 AMI MTR	EA	443.20	753,440.00
		PART #: 02-K-02-D-1-8A-8-UB			
270	250	1 FLOWIQ 2200 AMI MTR SS	EA	648.81	162,202.50
		PART #: 02-L-02-D-1-8D-8-UB			
290	35	2" FLOWIQ 3101 AMR MTR SS	EA	1,629.00	57,015.00
		17"LL, PART #: 03U-23-C0K-8EX			
310	5	4" FLOWIQ 3101 AMR MTR SS	EA	3,650.40	18,252.00
		14"LL, PART #: 03U-23-C0N-8EX			
330	1	8" MAG8000 METER W/ GROUNDING	EA	7,334.00	7,334.00
		RINGS & READY GATEWAY			
350	350	6' WALL ANTENNA F/ AMI MTR	EA	93.60	32,760.00
360	350	6' PIT ANTENNA F/ AMI MTR	EA	58.40	20,440.00
370		**** EQUIPMENT ****			
380	1	KAMSTRUP READY ADVANCED US CONVERTER 669640000.2	EA	3,490.72	3,490.72
390	1	READY BLUETOOTH OPTICAL HEAD	EA	744.80	744.80
400	1	ANDROID TABLET	EA	550.00	550.00
410	9	KAMSTRUP AMI RF COLLECTOR	EA	11,885.72	106,971.48
420	9	COLLECTOR INSTALLATION	EA	9,000.00	81,000.00
430		**** SOFTWARE ****			
440	1	READY MANAGER WATER AMI <2,401 (ONE TIME FEE)	EA	11,045.05	11,045.05
450	1	READY MANAGER HOSTING FEE (ANNUAL)	EA	4,247.20	4,247.20
460	1	AMI SYSTEM ROLLOUT PROJ. MGMT	EA	19,431.75	19,431.75
470		**** LEAK DETECTOR SOFTWARE ****			
480	1	LEAK DETECTOR ANNUAL SOFTWARE	EA	6,047.20	6,047.20
490	1	LEAK DETECTOR UP & RUNNING (ONE TIME FEE)	EA	453.00	453.00
500		**** OPTIONAL ADD-ONS ****			
510	1	EMAIL / TEXT OF INFO CODES (ANNUAL FEE)	EA	190.19	190.19
520	1	METER EXCHANGE SOFTWARE (ONE TIME FEE)	EA	1,628.91	1,628.91
530	1	METER EXCHANGE SFTWARE HOSTING (ANNUAL FEE)	EA	812.00	812.00
540	1	DISTRICT ANALYZER FOR AMI (ANNUAL FEE)	EA	2,148.00	2,148.00
550	1	DISTRICT ANALYZER UP & RUNNING (ONE TIME FEE)	EA	453.00	453.00
			AMI FIXED BASED SOLUTION		**1,290,656.80**

UNLESS OTHERWISE SPECIFIED HEREIN, PRICES QUOTED ARE VALID IF ACCEPTED BY CUSTOMER AND PRODUCTS ARE RELEASED BY CUSTOMER FOR MANUFACTURE WITHIN THIRTY (30) CALENDAR DAYS FROM THE DATE OF THIS QUOTATION. CORE & MAIN LP RESERVES THE RIGHT TO INCREASE PRICES TO ADDRESS FACTORS, INCLUDING BUT NOT LIMITED TO, GOVERNMENT REGULATIONS, TARIFFS, TRANSPORTATION, FUEL AND RAW MATERIAL COSTS. DELIVERY WILL COMMENCE BASED UPON MANUFACTURER LEAD TIMES. ANY MATERIAL DELIVERIES DELAYED BEYOND MANUFACTURER LEAD TIMES MAY BE SUBJECT TO PRICE INCREASES AND/OR APPLICABLE STORAGE FEES. THIS BID PROPOSAL IS CONTINGENT UPON BUYER'S ACCEPTANCE OF SELLER'S TERMS AND CONDITIONS OF SALE, AS MODIFIED FROM TIME TO TIME, WHICH CAN BE FOUND AT: https://coreandmain.com/TandC/

Neptune Quotation

FERGUSON WATERWORKS

FERGUSON WW #1423
7601 14TH AVENUE
SACRAMENTO, CA 95820-3601

Phone: 916-381-6100
Fax: 916-455-3402

Deliver To:
From: Adam Arevalo
Comments:

FERGUSON WATERWORKS #1423
Price Quotation
Phone: 916-381-6100
Fax: 916-455-3402

Bid No: B453126
Bid Date: 04/08/22
Quoted By: AA

Cust Phone: 916-381-6100
Terms: CASH ON DEMAND

Customer: CASH SALE ACCT - #1423
CVS - SACRAMENTO STORE
SACRAMENTO, CA 95826-6008

Ship To: CUSTOMER PICK-UP

Cust PO#: Neptune AMR Quotation

Job Name: CAL RURAL WATER

Item	Description	Quantity	Net Price	UM	Total
SP-NED2B22RPWG11	LF 5/8X3/4 T10 MTR P/C BRZ USG R900	1700	220.000	EA	374000.00
SP-NED2F22RPWG11	1 T10 MTR BRZ/BRZ P/C R900I USG	250	333.000	EA	83250.00
NED2H11RPWG11	LF 1-1/2 T10 MTR P/C R900I USG PIT	20	586.000	EA	11720.00
NED2J11RPWG11	LF 2 T10 MTR P/C R900I USG PIT	35	720.000	EA	25200.00
SP-NEU3C2G1	4 MACH10 R900I USG 14" LL	5	3313.000	EA	16565.00
SP-NEU4A2G1	8 MACH10 20 LL USG V4 R900I	1	8744.000	EA	8744.00
	METERS				519479.00

N13442200	R900 V4 PIT MIU W/ 6 FT WIRE	200	126.000	EA	25200.00
	RETROFIT MIUS				25200.00

N13980001	NEPTUNE 360 AMR SETUP FEE	1	1765.000	EA	1765.00
SP-N13980004	NEPTUNE 360 8 HR ONSITE TRAINING	1	1765.000	EA	1765.00
	SOFTWARE SETUP & TRAINING				3530.00

N13980103	NEPTUNE 360 AMR - 1001-2500	1	3000.000	EA	3000.00
	YEARLY SOFTWARE SUB FEE				3000.00

N13655100	MRX920 MOBILE DATA COL V4	1	8667.000	EA	8667.00
N13302100	R900 BELT CLIP TRANSCEIVER V3	1	5334.000	EA	5334.00
	READING EQUIPMENT				14001.00

Net Total:	$565210.00
Tax:	$49455.89
Freight:	$0.00
Total:	$614665.89

HOW ARE WE DOING? WE WANT YOUR FEEDBACK!
Scan the QR code or use the link below to
complete a survey about your bids:
https://survey.medallia.com/?bidsorder&fc=1423&on=411383

FERGUSON WATERWORKS

FERGUSON WATERWORKS #1423
Price Quotation

Fax: 916-455-3402

15:05:32 APR 08 2022

Reference No: B453126

Quoted prices are based upon receipt of the total quantity for immediate shipment (48 hours). SHIPMENTS BEYOND 48 HOURS SHALL BE AT THE PRICE IN EFFECT AT TIME OF SHIPMENT UNLESS NOTED OTHERWISE. QUOTES FOR PRODUCTS SHIPPED FOR RESALE ARE NOT FIRM UNLESS NOTED OTHERWISE.

CONTACT YOUR SALES REPRESENTATIVE IMMEDIATELY FOR ASSISTANCE WITH DBE/MBE/WBE/SMALL BUSINESS REQUIREMENTS.

Seller not responsible for delays, lack of product or increase of pricing due to causes beyond our control, and/or based upon Local, State and Federal laws governing type of products that can be sold or put into commerce. This Quote is offered contingent upon the Buyer's acceptance of Seller's terms and conditions, which are incorporated by reference and found either following this document, or on the web at https://www.ferguson.com/content/website-info/terms-of-sale
Govt Buyers: All items are open market unless noted otherwise.

LEAD LAW WARNING: It is illegal to install products that are not "lead free" in accordance with US Federal or other applicable law in potable water systems anticipated for human consumption. Products with *NP in the description are NOT lead free and can only be installed in non-potable applications. Buyer is solely responsible for product selection.
WATER FLOW RATE NOTICE: Lavatory Faucets with flow rates over 0.5 GPM are not allowed for 'public use' in California.
COVID-19 ORDER: ANY REFERENCE TO OR INCORPORATION OF EXECUTIVE ORDER 14042 AND/OR THE EO-IMPLEMENTING FEDERAL CLAUSES (FAR 52.223-99 AND/OR DFARS 252.223-7999) IS EXPRESSLY REJECTED BY SELLER AND SHALL NOT APPLY AS SELLER IS A MATERIALS SUPPLIER AND THEREFORE EXEMPT UNDER THE EXECUTIVE ORDER.

FERGUSON WATERWORKS

FERGUSON WW #1423
7601 14TH AVENUE
SACRAMENTO, CA 95820-3601

Phone: 916-381-6100
Fax: 916-455-3402

Deliver To:
From: Adam Arevalo
Comments:

FERGUSON WATERWORKS #1423
Price Quotation
Phone: 916-381-6100
Fax: 916-455-3402

Bid No: B460266
Bid Date: 07/06/22
Quoted By: AA

Cust Phone: 916-381-6100
Terms: CASH ON DEMAND

Customer: CASH SALE ACCT - #1423
CVS - SACRAMENTO STORE
SACRAMENTO, CA 95826-6008

Ship To: CUSTOMER PICK-UP

Cust PO#: Neptune AMI Quotation

Job Name: CALAVERAS PUD

Item	Description	Quantity	Net Price	UM	Total
SP-D2B22RYMG11SG89	5/8X3/4 T10 MTR BRZ R900I V5 W/ 6'	1434	296.000	EA	424464.00
NED2B22RPHG21	LF 5/8X3/4 T10 MTR P/C BRZ USG PIT	266	313.000	EA	83258.00
SP-N13966200	R900C PIT W/ 6' WIRE INT ANT	266	0.000	EA	0.00
	CELL MIU INCLUDED IN METER PRICE				
SP-D2F22RYMG11SG89	1 T10 ECDR R900I V5 USG W/ 6'	250	432.000	EA	108000.00
SP-D2H11RYMG11SG89	1-1/2 T10 ECDR R900I V5 GAL W/ 6'	20	736.000	EA	14720.00
SP-D2J11RYMG11SG89	2 T10 ECDR R900I V5 W/ 6' USG	35	896.000	EA	31360.00
SP-NEU3C5G1SG90	4 MACH10 14LL R900I V5 USG W/ 20'	5	3800.000	EA	19000.00
SP-NEU4A5G1SG90	8 MACH10 R900I V5 20 LL USG 20' ANT	1	10003.000	EA	10003.00
SP-N13966200	R900C PIT W/ 6' WIRE INT ANT	200	165.000	EA	33000.00
	METERS				723805.00

N13791100	R900 GATEWAY V5 ETHERNET VERIZON	2	10286.000	EA	20572.00
N13878000	UPS KIT R900I IOT GATEWAY	2	8043.000	EA	16086.00
N13146100	R900 GATEWAY RF ANTENNA	4	435.000	EA	1740.00
FNAMI	NEPTUNE - INFRASTRUCTURE INSTALL	2	15000.000	EA	30000.00
N13655100	MRX920 MOBILE DATA COL V4	1	9286.000	EA	9286.00
	HARDWARE & INFRASTRUCTURE				77684.00

N13980203	NEPTUNE 360 AMI - 1001-2500	1	6257.250	EA	6257.25
SP-N13980303	N360 & FIRSTNET 1001-2500	1	6500.200	EA	6500.20
SP-N13980002	NEPTUNE 360 AMI SET UP FEE	1	4062.500	EA	4062.50
SP-N13980004	NEPTUNE 360 8 HR ONSITE TRAINING	1	1875.000	EA	1875.00
	SOFTWARE YEAR 1				18694.95

Net Total:	$820183.95
Tax:	$71766.11
Freight:	$0.00
Total:	$891950.06

HOW ARE WE DOING? WE WANT YOUR FEEDBACK!
Scan the QR code or use the link below to
complete a survey about your bids:
https://survey.medallia.com/?bidsorder&fc=1423&on=411383

FERGUSON WATERWORKS

FERGUSON WATERWORKS #1423
Price Quotation

Fax: 916-455-3402

11:39:26 JUL 07 2022

Reference No: B460266

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Appendix D

California Rural Water Association **20-yr Net Present Value Calculation**

CPUD Meters, AMR

Initial cost:		Adj. 20 yr O&M:		Net Present Value:
$449,000	+	$744,000	=	$1,193,000

Operations and Maintenance	Quantity	Unit	Period	Cost/Unit	Annual Cost	Overhaul Cost	Notes
General Labor	80	hour	quarterly	$90.00	$28,800.00		AMR reading of entire system, 4 days 2 employees & Checking meters / issues
Software Fee	1	Each	annual	$980.00	$980.00		AMR software annual cost
Administration and Billing	32	hour	monthly	$65.00	$24,960.00		4 days, 1 employees, every month
			Years				
Full Overhaul Materials		LS	20			$0.00	
Overhaul Labor		hour	20			$0.00	
				Totals:	$54,740.00	$0.00	

Calculations of Annual Costs:

Assumed Discount Rate: 4.0%

Year	NPV Ann. Cost	NPV O/H Cost:
1	$52,634.62	
2	$50,610.21	
3	$48,663.66	
4	$46,791.98	
5	$44,992.29	
6	$43,261.82	
7	$41,597.90	
8	$39,997.98	
9	$38,459.60	
10	$36,980.38	
11	$35,558.06	
12	$34,190.44	
13	$32,875.43	
14	$31,610.99	
15	$30,395.18	
16	$29,226.13	
17	$28,102.05	
18	$27,021.20	
19	$25,981.93	
20	$24,982.62	$0.00
Total:	$743,934.46	$0.00

California Rural Water Association **20-yr Net Present Value Calculation**

CPUD Meters, AMI

Initial cost:		Adj. 20 yr O&M:		Net Present Value:
$507,000	+	$633,000	=	$1,140,000

Operations and Maintenance	Quantity	Unit	Period	Cost/Unit	Annual Cost	Overhaul Cost	Notes
General Labor	16	hour	quarterly	$90.00	$5,760.00		Checking meters / issues
Software Fee	1	Each	annual	$15,815.00	$15,815.00		AMR software annual cost
Administration and Billing	32	hour	monthly	$65.00	$24,960.00		4 days, 1 employees, every month
			Years				
Full Overhaul Materials		LS	20			$0.00	
Overhaul Labor		hour	20			$0.00	
				Totals:	$46,535.00	$0.00	

Calculations of Annual Costs:

Assumed Discount Rate: 4.0%

Year	NPV Ann. Cost	NPV O/H Cost:
1	$44,745.19	
2	$43,024.22	
3	$41,369.45	
4	$39,778.31	
5	$38,248.38	
6	$36,777.29	
7	$35,362.78	
8	$34,002.67	
9	$32,694.87	
10	$31,437.38	
11	$30,228.25	
12	$29,065.62	
13	$27,947.72	
14	$26,872.80	
15	$25,839.23	
16	$24,845.42	
17	$23,889.82	
18	$22,970.98	
19	$22,087.49	
20	$21,237.97	$0.00
Total:	$632,425.84	$0.00

California Rural Water Association **20-yr Net Present Value Calculation**

CPUD Meters, Hybrid

Initial cost:		Adj. 20 yr O&M:		Net Present Value:
$504,000	+	$789,000	=	$1,293,000

Operations and Maintenance	Quantity	Unit	Period	Cost/Unit	Annual Cost	Overhaul Cost	Notes
General Labor	48	hour	quarterly	$90.00	$17,280.00		AMR reading of entire system, 2 days 2 employees & Checking meters / issues
Software Fee	1	Each	annual	$15,815.00	$15,815.00		AMR software annual cost
Administration and Billing	32	hour	monthly	$65.00	$24,960.00		4 days, 1 employees, every month
			Years				
Full Overhaul Materials		LS	20			$0.00	
Overhaul Labor		hour	20			$0.00	
				Totals:	$58,055.00	$0.00	

Calculations of Annual Costs:

Assumed Discount Rate: 4.0%

Year	NPV Ann. Cost	NPV O/H Cost:
1	$55,822.12	
2	$53,675.11	
3	$51,610.68	
4	$49,625.66	
5	$47,716.98	
6	$45,881.71	
7	$44,117.03	
8	$42,420.22	
9	$40,788.67	
10	$39,219.88	
11	$37,711.42	
12	$36,260.98	
13	$34,866.33	
14	$33,525.32	
15	$32,235.88	
16	$30,996.04	
17	$29,803.88	
18	$28,657.58	
19	$27,555.37	
20	$26,495.54	$0.00
Total:	$788,986.40	$0.00

CALAVERAS PUBLIC UTILITY DISTRICT
RESOLUTION NO. 2023-03

A RESOLUTION AUTHORIZING THE GENERAL MANAGER TO EXECUTE A CONSULTING AGREEMENT WITH PETERSON BRUSTAD INC.

WHEREAS, the District has a need for engineering services to develop a Water Master Plan, 5-year Capital Improvement Program, and a 20-year Asset Management Program to address the District's facilities and long-term needs. replace existing equipment that has outlived its useful life and/or augment the District's vehicle equipment capabilities to address maintenance and repairs within the District service area; and

WHEREAS, the Board of Directors has approved a funding agreement with the Drinking Water State Revolving Fund to develop a Water Master Plan as a line item in the Jeff Davis Water Treatment Plant Planning Grant; and

WHEREAS, the District solicited proposals for the Water Master Plan competitive request for proposals, and Peterson Brustad Inc. offered the best proposal for the District to complete the Water Master Plan; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Calaveras Public Utility District that the General Manager be and hereby is authorize to execute an agreement on behalf of the District with Peterson Brustad Inc. for Water Master Plan, 5-year CIP, and 20-year AMP in the amount of $160,171. A copy of the proposal and cost table are attached to this resolution.

The foregoing resolution was duly approved and adopted by the Board of Directors of the Calaveras Public Utility District at a regular meeting on the 14th day of February 2023 by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

Signed: _____
Richard Blood, President of the Board of Directors

Attest: _____
Carissa Bear, Secretary/Clerk of the Board

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

February 6, 2023

Attn: Mr. Travis Small
Calaveras Public Utility District
Submitted via email: Info@cpud.org

Subject: Proposal for Water Master Plan

Dear Mr. Small,

We are pleased to submit to you our proposal to update the Water Master Plan. **We are excited about the opportunity to work with the Calaveras Public Utility District (CPUD) and see this project as a perfect fit for Peterson Brustad Inc. (PBI).**

Peterson Brustad Inc. (PBI) was the author of the original Water Master Plan in 2008. Therefore, PBI is has the unique ability to streamline the update of the prior Water Master Plan and focus our effort on the evaluation of specific projects as outlined in the grant.

Peterson Brustad Inc. (PBI) consistently provides principal involvement throughout the project. We base our approach to Projects and Clients on providing Principal level management on every project. The District can have the confidence that this project will receive the complete attention and the experience of PBI to ensure success. Our Principal-In-Charge for this project will be Karl Brustad, a founding Principal of PBI, who was the Principal and Project Manager for the original water master plan back in 2008. Our team includes staff members who previously worked together on similar projects for the City of Folsom, Calaveras County Water District, and the Fair Oaks Water District.

We are confident that we have the qualifications, expertise, experience, dedication, and responsiveness to complete this project for CPUD. We have proposed a team of qualified engineers, with recent and relevant experience in master planning and modeling for local agencies, to support this project. We have developed and updated water system models in association with multiple water master plans that we have completed for several of our clients. **PBI can and will perform the services and adhere to the requirements requested in this RFP.**

Locally based engineering firm in the Foothills. Our office is located on Blue Ravine Road, in Folsom, just 60 minutes from the District's office. This local presence not only provides the District with added local knowledge, it also provides a quicker response time. Additionally, we have several on-going projects with neighboring agencies in the foothills area. We plan to do what is necessary to develop and sustain a long-term relationship with the District.

We look forward to the opportunity to work with the District again on your upcoming project. If you have any questions or desire any additional information, please do not

hesitate to contact me at (916) 608-2212. This proposal, signed by Karl Brustad, shall remain a firm offer for services for a ninety-day period from the date signed.

Sincerely,

Karl Brustad, PE, MBA
Principal, President
Peterson Brustad, Inc.
kbrustad@pbieng.com
(916) 804-6671

Ashley Smith, PE
Project Manager
Peterson Brustad, Inc.
asmith@pbieng.com
(530) 200-6309

PETERSON . BRUSTAD . INC
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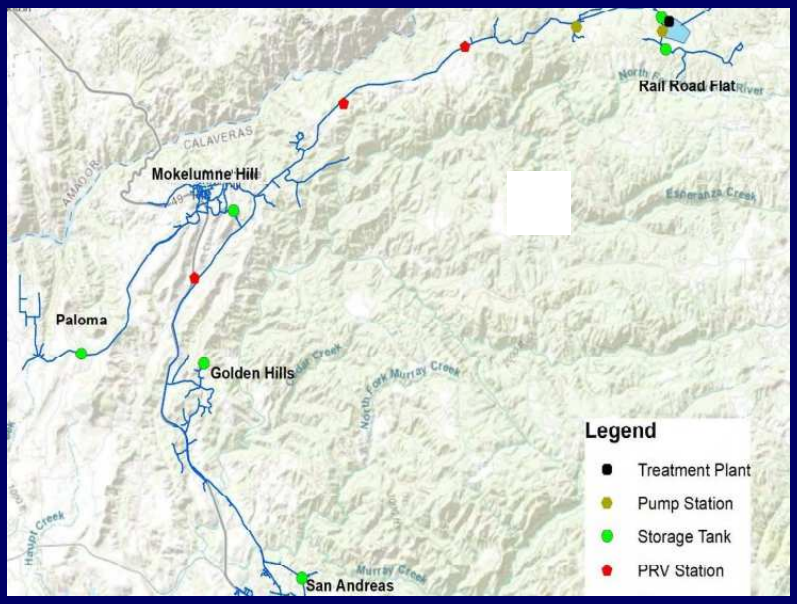
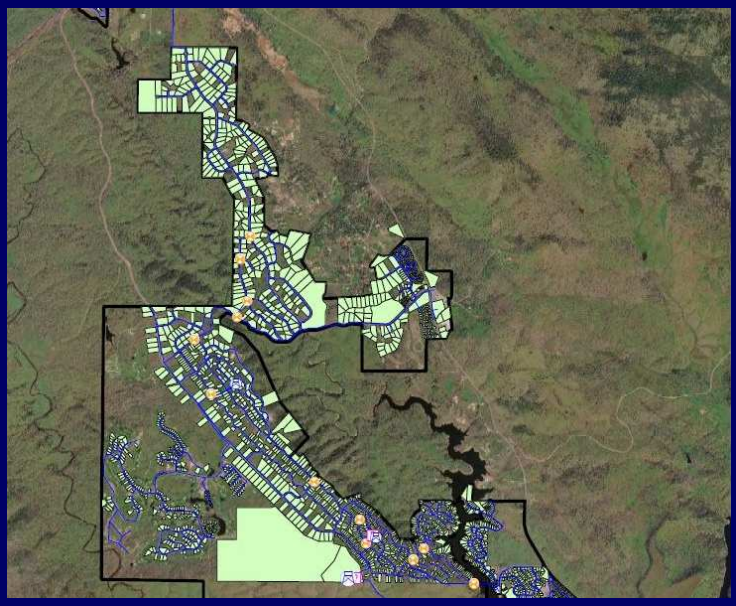
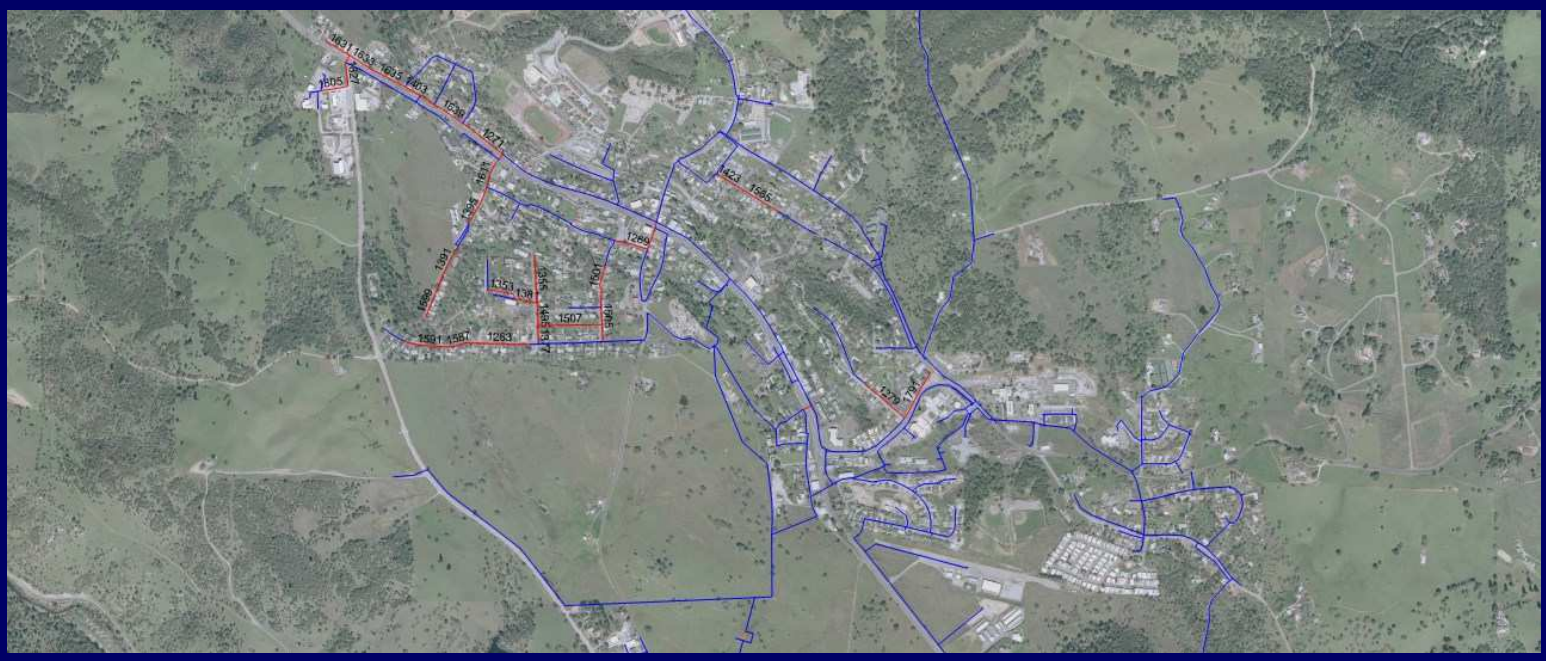
Request for Proposal for Calaveras Public Utility District **2023 Water Master Plan**

February 6, 2023







Peterson Brustad Inc.
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Karl Brustad, PE, MBA
Principal
(916) 608-2212

FIRM'S QUALIFICATIONS

Firm Background and History

Peterson Brustad Inc. (PBI) was founded in September 2005 to provide engineering consulting services for the **water industry**. With an office in Folsom, California, we develop innovative and cost-effective solutions for our clients' water resources, drinking water, wastewater and recycled water projects. Our last active founding principal, Karl Brustad, has more than 28 years of experience in the water industry, and is actively involved in project delivery. He ensures that his clients receive expert attention, high quality products, and outstanding client service.

PBI is a small but specialized engineering firm. We only design, manage and support water related projects. Our water focus ensures our water clients receive quality design services at the utmost efficiency. Our current staff of 14 full-time and part-time employees, including six professional engineers, always stays dedicated to our projects from beginning to end.

PBI's founding principals, Dave Peterson and Karl Brustad, have both come from large consulting firms where they found themselves spending more time with corporate issues and less time with clients and projects. They founded the firm with the objective of returning their focus to clients and projects. We are able to provide a broad range of services to our clients while maintaining the streamlined level that allows us to rapidly respond to our clients' needs without having to report to a corporate entity for direction and permission.

History of Repeat Business

The true measure of a firm's quality of service comes in the form of repeat business. More than 80% of our annual services over the last five years have been from repeat business. In our eighteen years in business PBI has amassed multiple projects with several of our clients shown in the table below. These clients have come to trust PBI with their water projects.

No. of Projects	Client	No. of Projects	Client
30+	San Joaquin Area Flood Control Agency (SJAFCA)	60+	California American Water (Cal Am)
30+	Sutter Butte Flood Control Agency (SBFCA)	20+	Placer County Water Agency (PCWA)
30+	Calaveras County Water District (CCWD)	20+	San Joaquin County (SJC)
10+	Sacramento Suburban Water District (SSWD)	20+	City of Folsom
8	Sutter County	6	City of Yuba City

Relevant Experience

PBI has developed numerous water master plans for our clients, which included condition assessments of existing facilities, development of hydraulic models for the evaluations of distribution systems, identification of deficiencies, alternatives analysis and identification of recommended improvements used to support the development of capital improvement programs. The PBI team has supported water master plans and hydraulic modeling for both large and small water Districts including; City of Stockton, City of Folsom, Calaveras County Water District, Fair Oaks Water District, El Dorado Irrigation District and Placer County Water Agency. Most notably, PBI developed Calaveras Public Utility District's (CPUD) 2008 Water Master Plan. PBI's relevant experience and intimate familiarity with CPUD's water system makes us the best choice to support CPUD's Water Master Plan Update.

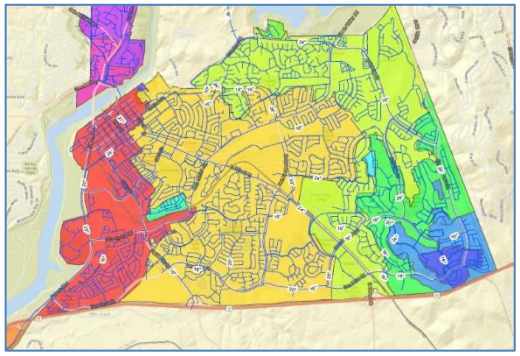
EXPERIENCE AND REFERENCES

Water Master Plan
Calaveras Public Utility District 2008

- PBI developed a water master plan that included a detailed capital improvement plan (CIP) used to support financial planning and ensure adequate funding for future improvements.
- A hydraulic model was developed using H2OMap Water 8.0 to analyze different water supply and demand scenarios throughout the distribution system representing approximately 3,000 rural customers in mountainous terrain.
- The Master Plan included an evaluation of the water system's water supply, water demands, water treatment facilities, transmission system, distribution system, and storage facilities.
- Included the development of a CIP for a 20+year planning period to year 2030.

Key personnel and roles: Karl Brustad
Client Reference: Gary Goffe (retired), General Manager, CPUD, 506 West Saint Charles Street, San Andreas, CA 95249 (209) 754-9442

2016 Water Master Plan Update and 2015 Urban Water Management Plan
City of Folsom 2015 to 2017



- Provided evaluation of the water system relative to current and future water demands consistent with 2015 Urban Water Management Plan
- Identified system improvements.
- Updated hydraulic models for existing, intermediate, and build out scenarios
- Development of 10-year Capital Improvement Program
- Performed evaluation of existing distribution system to identify pipeline improvements.

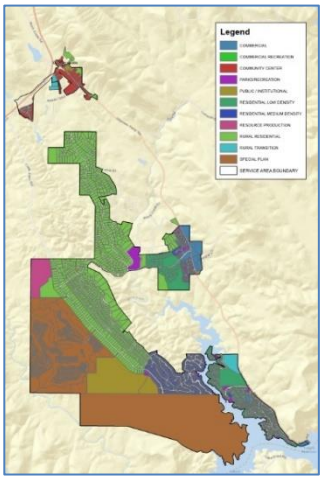
Key personnel: Karl Brustad, Ashley Smith
Client Reference: Marcus Yasutake, Director of Utilities, City of Folsom, 50 Natoma Street, Folsom, CA 95630 (916) 351-3528

Ebbetts Pass Reach Water Master Plan and Capacity Charges
Calaveras County Water District (CCWD) 2013

- Evaluated historical water demands and growth rates for three different regions of the Ebbetts Pass water system.
- Updated water master plan and provided capacity charge updates
- Developed capital improvement projects including: storage tanks, treatment facilities, booster pump stations, and distribution system piping
- Evaluated existing capacity charges and made recommendations for new updated charges.
- Estimated costs for build-out conditions

Key personnel: Karl Brustad, Ashley Smith
Client Reference: Charles Palmer, District Engineer, CCWD, 120 Toma Court, San Andreas, CA 95249 (209) 642-3209.

Jenny Lind Water System and Copper Cove Water System Master Plan and Capacity Charge
Calaveras County Water District (CCWD) 2014



- Updated water master plan and provided capacity charge updates
- Evaluated historical water demands and growth rates for the Jenny Lind Water System
- Developed existing and build-out conditions water system models utilizing Innovyze InfoWater to assess the systems in comparison to District design standards.
- Evaluated existing capacity charges and made recommendations for new updated charges.
- Developed capital improvement projects including: storage tanks, treatment facilities, booster pump stations, and distribution system piping.
- Estimated costs for build-out conditions

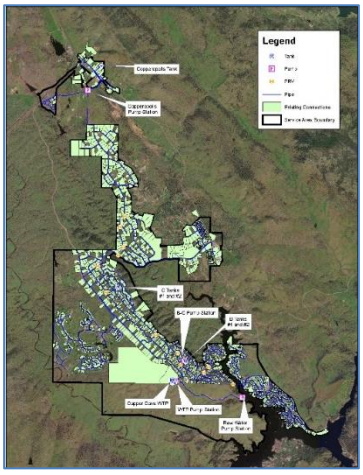
Key personnel: Karl Brustad, Ashley Smith
Client Reference: Charles Palmer, District Engineer, CCWD, 120 Toma Court, San Andreas, CA 95249 (209) 642-3209

2020 and 2015 Urban Water Management Plan
Fair Oaks Water District (FOWD)

- Recently completed the 2020 UWMP and WSCP
- PBI prepared in its entirety the 2015 UWMP per California Water Code
- Evaluated all aspect of the UWMP sections including water supply and demand for existing and future build-out scenarios, water shortage contingency planning, system supplies, and other factors

Key personnel: Karl Brustad, Ashley Smith, Morgan Lane
Client Reference: Ali Shafaq, Associate Engineer, Fair Oaks Water District, 10326 Fair Oaks Blvd., Fair Oaks, CA 95628 (916) 844-3520

Copper Cover Water System Improvements
Calaveras County Water District (CCWD) 2022



- Design New Water Treatment Plant Clearwell
- Perform Existing Water Treatment Plant Clearwell Condition Assessment and Rehabilitation
- Design B Tank (Redwood) Replacement
- Perform B Tank (Steel) Condition Assessment and Rehabilitation
- Design B Zone Booster Pump Station Replacement
- Evaluate Lake Tulloch Emergency Intertie Project Assessment
- Design C1 and Copper Valley Transmission Main
- Evaluate C-Tanks Overflow Discharge Improvements

Key personnel: Karl Brustad, Ashley Smith
Client Reference: Charles Palmer, District Engineer, CCWD, 120 Toma Court, San Andreas, CA 95249 (209) 642-3209

Folsom Plan Area (FPA) Hydraulic Model Update
City of Folsom 2018 to Present

- Integrating planned FPA and existing developments into the City's hydraulic model
- Redistributed demand data to new development by land type
- Model runs tested to confirm acceptable importation of new infrastructure

Key personnel: Karl Brustad, Ashley Smith, Morgan Lane
Client Reference: Marcus Yasutake, Environmental & Water Resources Director, City of Folsom, 50 Natoma Street, Folsom, CA 95630 (916) 351-3528

QUALIFICATIONS OF TEAM

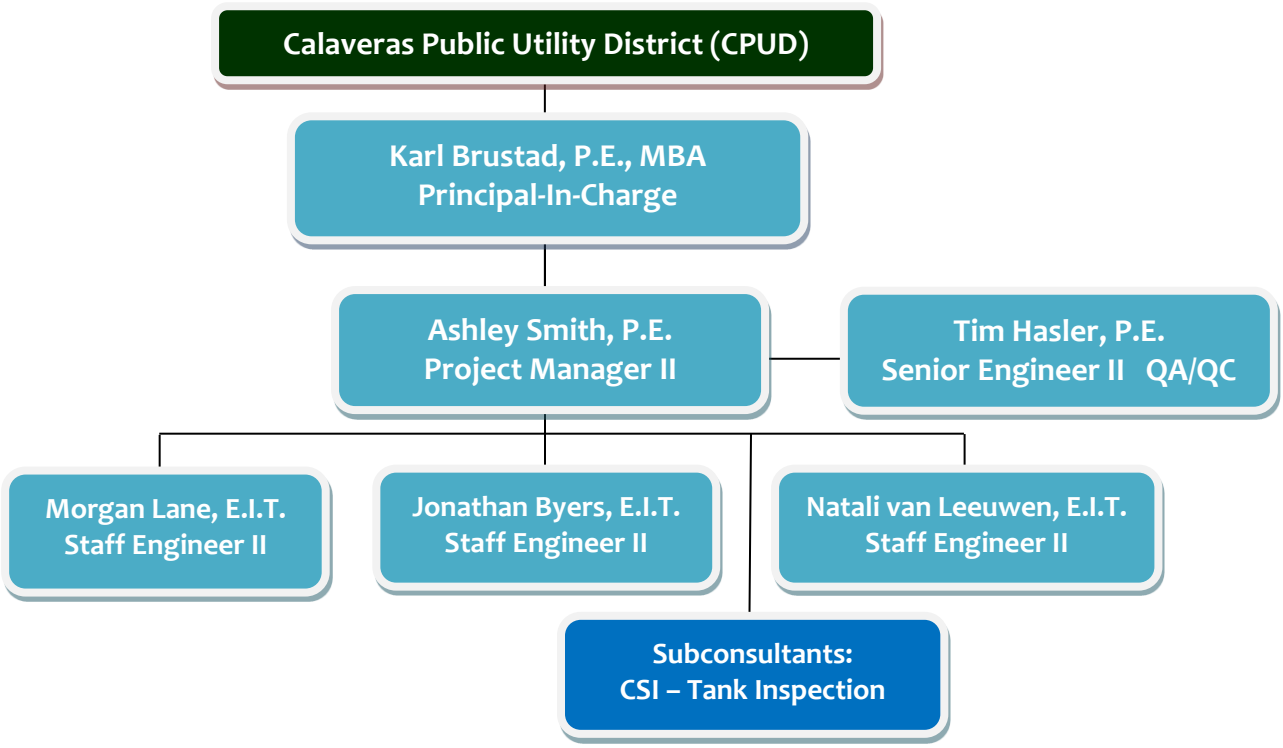
Project Organization

Our team is being led by Karl Brustad, an experienced, highly qualified Principal-in-Charge that is committed to your project. Karl has a background that is specialized in the design and management of water facilities. He is a Principal and founding partner of Peterson Brustad Inc. and has the complete authority to negotiate contracts and act on behalf of the firm. Karl will provide principal level involvement and oversight for your project.

Ashley Smith, P.E., will serve as Project Manager and will be the District's primary point of contact and will oversee all aspects of the project. CSI will be a subconsultant providing tank inspection services for the existing clearwell. All team members are located in our Folsom office which is less than 60 miles from the District's office in San Andreas, providing a quick response to the District should the need arise.

Unmatched Staff Commitment. The District can rest assured that the key-staff identified in our proposal will be the same individuals that will be supporting the project at its completion. We do not and will not perform the infamous "bait and switch" on any of our projects, which is so commonly experienced by many of our clients.

Figure 1 – Key Project Team Organizational Chart



Highly Qualified Project Team

Karl Brustad, P.E. Principal-in-Charge

M.B.A. CSU, Sacramento
B.S. Civil Engineering, CSU Chico
Professional Civil Engineer, CA
CA Grade IV Water Treatment Operator
Over 25 Water Master Plans

Technical Specialties

- Water/Wastewater Master Planning
- Water/Wastewater Infrastructure Planning, Design and Operation
- Water Treatment Planning and Design
- Construction Management

Our team is being led by Karl Brustad, a principal and founding partner of Peterson Brustad Inc., and an experienced, highly qualified project manager that is committed to your project. His background is specialized in the design and management of water facilities, with more than 28 years of experience in the planning and design of water/ wastewater infrastructure, water treatment design, and construction management services. Karl's entire professional career has been centered around water; including over five years working for a water utility. It's this experience that allowed Karl to learn first-hand the dos and don'ts of consulting. Karl is not only a professional engineer - he has supplemented his engineering background with a master's in business and administration and is a licensed Grade IV water treatment plant operator.

Project Highlights

- ***Calaveras Public Utility District Water Master Plan*** *– CPUD San Andreas, CA – developed water system model and performed hydraulic analysis of system in support of water master plan.*
- ***2016 Water Master*** *Plan – City of Folsom, CA. Updated existing hydraulic model and allocated demand consistent with 2015 UWMP. Included evaluation of distribution system to support development of CIP.*
- ***Cal Am Well Rehab Master Plan*** *– Cal Am, Sacramento, CA – Performed condition assessment of above and below grade improvements for over 100 wells. Utilized matrix analysis to prioritize improvements and develop a 10-year CIP.*
- ***City of Stockton Water Master Plan*** *– City of Stockton, CA – Acted as extension of staff to manage the development of the City's Water and Wastewater master plans. Included evaluation of distribution system to support development of CIP.*
- ***Citizens Utilities Water Master Plans*** *– Developed water system master plans for six individual water systems: Montara, Felton, Arden, Lincoln Oaks, Antelope, and Parkway. Included evaluation of distribution systems to support development of CIPs.*
- ***2005 Ebbetts Pass Water Master Plan and Capacity Charges*** *– Calaveras County Water District (CCWD) San Andreas, CA – developed a water facility and financial master plan for Ebbetts Pass Water System. Updated water master plan and system model, evaluated existing capacity charges, and prepared a phased capital improvements plan. Included evaluation of distribution system to support development of CIP.*
- ***Jenny Lind and Copper Cove Water Systems Master Plan and Capacity Charges*** *– CCWD - Converted existing H2Omap hydraulic model into current Innovyze InfoWater modeling software in support of developing water master plan. Evaluated existing capacity charges and made recommendations for new updated charges.*
- ***Hydraulic Model Update and Model Support –*** *Fair Oaks Water District - Converted existing H2Omap model into InfoWater and allocating system demand with UWMP. Performed model verification with data provided by FOWD and assisted FOWD staff with model operation and data management.*

Ashley Smith, P.E., Project Manager II

B.S. Civil Engineering, UC - Davis
Professional Civil Engineer, CA
Grade II Water Treatment Plant Operator
Innovyze InfoWater – Water Distribution Modeling Training

Technical Specialty

- Water Master Planning
- Water Infrastructure Planning & Design
- InfoWater Hydraulic Modeling
- Auto CAD/Civil 3D Design

Ashley will serve as the Project Manager under Principal-in-Charge Karl Brustad. Ashley has been managing water resources projects since 2013. She has experience managing the PBI team as well as specialty subconsultants and has earned the trust and respect of clients and their staff. Additionally, Ashley has been the responsible lead engineer for numerous water infrastructure projects since she joined PBI in 2014. Her design experience includes: water treatment plants, water storage tanks, pump stations, and pipelines. She also has planning experience in water system master plans, capital improvement plans, flood management, and cost estimating. Sample relevant recent past and current projects include:

Project Highlights

- ***Recycled Water Master Plan Update and Hydraulic Model*** *- City of Folsom, CA. Project manager for the updating of the 2015 Folsom Plan Area (FPA) Non-Potable Water Analysis 2. in conjunction with developing a hydraulic model for the non-potable water distribution system.*
- ***On-Call Modeling Support Services*** *- City of Folsom. Water System Importing for Folsom Plan Area Developments into model and modeling of fire flow tests.*
- ***2016 Water Master Plan*** *– City of Folsom, CA. Updated existing hydraulic model and allocated demand consistent with 2015 UWMP. Provided evaluation of the distribution system in support of 10-year CIP.*
- ***2015 and 2020 Urban Water Management Plan –*** *Fair Oaks Water District (FOWD), Fair Oaks, CA. – PM for recently completed 2020 UWMP update to the 2015 UWMP (which PBI also developed) for the assessment of all water utilities in Fair Oaks. Provided analysis for the current system and its efficiency and designed a master plan that would be capable of satisfying the existing and future build out scenarios for the system.*
- ***Jenny Lind and Copper Cove Water System Master Plans*** *– Calaveras County Water District (CCWD), San Andreas, CA. Developed water master plans for two water systems. Developed existing and build-out conditions water system models utilizing Innovyze InfoWater to assess the systems.*
- ***Folsom Plan Area (FPA) Hydraulic Model Update*** *- City of Folsom. PM for Integrating planned FPA and existing developments into the City's hydraulic model and redistributing demand data to new development by land type.*
- ***2017 Water System Model Update*** *– FOWD, Fair Oaks, CA. Project Engineer for the update to the existing hydraulic model. Updated model characteristics with new facilities and verified model results with field fire flow tests.*
- ***Ebbetts Pass Water System Master Plan and Capacity Charges*** *- Calaveras County Water District, San Andreas, CA. Evaluated and updated water master plan and made recommendations for new updated charges. Project included evaluation of historical water demands and growth rates. Developed capital improvement projects and estimated costs for build-out conditions.*
- ***On-Call Extension of Staff Services*** *– Fair Oaks Water District, Fair Oaks, CA. Provided ongoing support for on-call extension of staff to support hydraulic model inquiries. This includes staff training on use of the District's recently updated water system model.*

PROJECT UNDERSTANDING

Project Background, Purpose, and Goals

The Calaveras Public Utility District is dedicated to providing an environmentally sustainable, reliable & cost-effective drinking water supply. To that end, PBI understands that CPUD is soliciting proposals for the Water Master Plan Update Project. The Water Master Plan was last updated in 2008 by PBI. We further understand that the primary goals identified for this project are:

- Review the existing Water Master Plan and identify and complete the necessary updates to the plan.
- Review water demands and supply and provide recommendations for meeting existing and ultimate water demands, including during drought and emergency scenarios.
- Evaluate the capacity of the existing water system such as raw water storage, raw water conveyance, water treatment plant, distribution piping, pumping, and storage facilities with respect to meeting existing and ultimate water demands, including current and future fire flow capabilities.
- Update/Calibrate the District's current hydraulic model.
- Provide detailed recommendations for Water Treatment Plant Improvements that consider capacity, regulations, and maintenance costs.
- Evaluate the materials, ages, and conditions of the existing infrastructure and provide recommendations on anticipated remaining service lives, and recommendations on options or opportunities to increase service life. (Raw Water, Treatment, Storage, Transmission, and Distribution)
- Determine the most cost-effective improvements for the water treatment plant, raw water storage, raw water conveyance, distribution system including the pipelines, storage facilities and pump stations.
- Review the vulnerability of the infrastructure and provide recommendations to assist the district with the any updates to the risk and resilience assessment and emergency response planning.
- Prepare an asset list of recommended capital facilities improvements including estimated costs and implementation schedule for a 5-year CIP and a 20-year Asset Management Program.
- When developing the 5-year CIP and 20-year Asset Management Program, conduct Board, Staff and Public Workshop for Staff and Public input.

CPUD was established in 1934 as a publicly owned utility to provide water to San Andreas, Mokelumne Hill and outlying areas. The system was designed with excess capacity to allow for population growth, which is why CPUD has adequate water to make it through drought years such as we have recently experienced. Today, CPUD pumps over 450 million gallons of water per year for the nearly 2000 customers in the 35 square mile District serving a population of almost 5000 people.

The Current Water System includes the following infrastructure:

- Distribution and transmission mains (approximately 40 miles)
- Tank Storage (7 total tanks with approximately 6 MG of storage)
- >10 distinct Pressure Zones with >10 pressure regulating stations
- No intertie facilities with other local agencies
- The District has 1 Water Treatment Plant
- Various other ancillary infrastructure.

We have done our research and reviewed the available documents: 2008 Water Master Plan, 2012 Master Plan Analysis, 2015 Water Treatment Plant Evaluation, and the 2022 Distribution Feasibility Study by California Rural Water Association. The 2008 Water Master Plan, authored by PBI, recommended

annualized aging pipeline replacements as well as various raw water reservoir and conveyance improvements, water treatment process improvements, and pumping improvements. The 2012 Master Plan Analysis summarized the prior recommendation of the 2008 Water Master Plan. The 2015 Water Treatment Plant Evaluation recommended improvements for each step of the existing treatment process as well as various pump station/ PRV station improvements. The 2022 Distribution Feasibility Study recommended various transmission and distribution main improvements as well as water meter replacement with full AMI meters throughout the system. PBI will verify all prior recommendations as part of the system evaluation for this project.

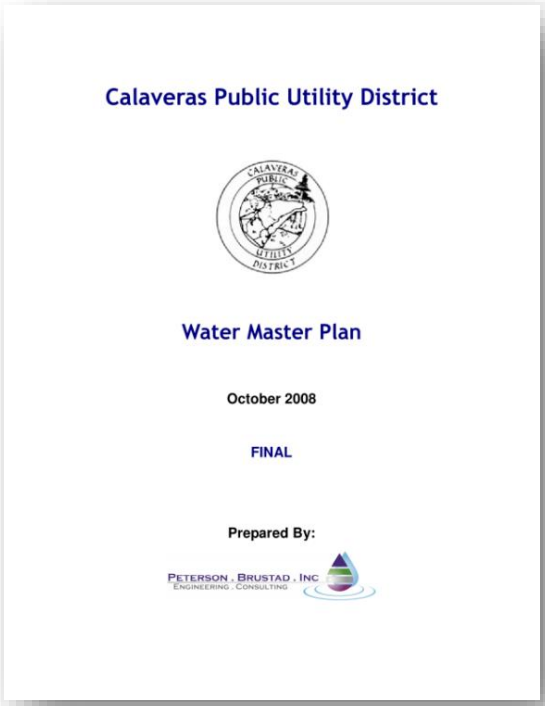
Approach to Scope of Work

PBI has reviewed CPUD's grant and understands that $175,000 in grant funding is dedicated to support the master plan including advanced alternatives analysis and preliminary development of recommended improvements. PBI also understands that approximately $12,000 has been spent to date, leaving approximately $160,000 to support this effort. Our approach is to maximize the use of the available grant funding to provide CPUD the best value while completing all tasks required in the grant. It is important to note that CPUD will benefit greatly by maximizing the grant funding and advancing the preliminary design efforts of the recommended projects as this will better position the District for future grant funding opportunities. Not maximizing the funding would negatively impact future grant funding applications. **Our approach is to not only fulfill the commitments of CPUD's current grant but optimize this available funding to better position the District for future grant funding.**

We understand the grant has the following objectives for this project:

- Develop a System master Plan & Water Model
- Conduct a Clearwell Tank Evaluation (detailed evaluation require drained tank).
- Gather existing data of water system
- Develop & Evaluate Alternatives, including but not limited to:
    - Rehabilitate the existing failing 0.5 MG welded steel tank clearwell
    - Upgrade the chemical feed systems
    - Install Supervisory Control and Data Acquisition (SCADA) Integration
    - Upgrade the Jeff Davis Reservoir aeration mixing unit
    - Upgrade the treatment filters systems
    - Upgrade the recycle backwash systems
    - Evaluate original pipelines at Jeff Davis Water Treatment Plant and the South Fork Pump Station Facility
- Host Public Workshops
- Prepare Conceptual Design and Parameters
- Prepare Alternatives Evaluation Report

In addition to the items listed above, we understand that the District is interested in evaluating alternatives for the replacement of the existing direct filtration water treatment facilities with a conventional treatment process. We will also evaluate alternatives to provide raw water to the water treatment plant via gravity in lieu of the existing pumped system to enhance system reliability and minimize long term operational costs.


Calaveras Public Utility District

Water Master Plan

October 2008

FINAL

Prepared By:

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

PBI authored the 2008 Water Master Plan and is familiar with CPUD's existing system. Therefore, PBI can streamline the update of the prior Water Master Plan and focus our effort on the evaluation of specific projects as outlined in the grant as well as the development of the 5-year CIP and 20-year Asset Management Program.

PBI will also evaluate additional projects to help improve the CPUD system, such as upgrading the Jeff Davis WTP to a conventional water treatment plant and evaluate alternative raw water reservoir connections.

Jeff Davis Water Treatment Plant

The Jeff Davis Water Treatment Plant is an unconventional treatment process that has been grandfathered in but does not meet current water treatment standards. PBI will evaluate alternative conventional treatment options to bring CPUD to current treatment standards. PBI has experience with installing Trimite/Trident packaged treatment units in two neighboring water systems.

Raw Water Reservoir

We understand the current raw water supply is all pumped and there is an opportunity to re-construct all or a portion of the middle fork Mokelumne River diversion canal to bring water by gravity to the existing pump station or to the Jeff Davis WTP.

The Schaads reservoir is approximately 6.25 miles northeast of the Jeff Davis reservoir in a straight line. The Schaads Reservoir is at approximately 2,910 feet, where the Jeff Davis reservoir is at approximately 2,760 feet. Moving water through the Schaads reservoir to the Jeff Davis Reservoir may be feasible using a ditch and tunnel. The terminus could be the existing raw water pump station, offering additional suction side head for the existing pump station, reducing pumping costs. PBI will include an evaluation of this alternative project to help minimize CPUD's long term operational costs.

Additional Considerations

Obtain and Review Detailed Data

A review of the modeled system should be done before any changes or efforts are made to rationally develop model data. Therefore, PBI will obtain and review any available data for use in calibrating the hydraulic model. PBI will work with CPUD Staff to gain an understanding in regards to the existing system pressures, component settings (i.e. tanks, pump stations, PRV's, etc.), and the types of detailed data that is available (i.e. flow meter data, diurnal demand curves, system pressure readings, etc.) As

part the review process, PBI will check the modeled elevations and backbone system components (main sizes, pump curves, and hydrant locations) to verify consistency with available data and system maps.

PBI will also estimate the uncertainty associated with each of the data sources as part of this task. Numerous factors can contribute to disagreement between model and field observations. Any and all input data that have uncertainty associated with them are candidates for adjustment during calibration to obtain reasonable agreement between model-predicted behavior and actual field behavior.

Baseline Assumptions

Our approach to developing water master plans is to reach a common understanding with our clients on all assumptions and approaches in advance of updating the hydraulic model and developing a draft master plan. This is a collaborative effort allowing us to provide recommendations, receive feedback from CPUD and ultimately summarize all critical assumptions and approaches that can be published in a Baseline Assumptions TM and agreed upon in advance of proceeding with model updates. This has proven to be a very effective way in streamlining the process while avoiding unnecessary rework.

Model Calibration and Validation

We understand that CPUD had their hydraulic model recently updated and calibrated by California Rural Water Association. Our approach is to compare the previously developed hydraulic model with the updated model to confirm accuracy of the hydraulic model. We have extensive modeling experience and have had several opportunities to use hydraulic models developed by others. These opportunities have taught us that we can't assume that everyone knows how to appropriately develop hydraulic models and we always perform a thorough review of the hydraulic model to ensure its development was appropriate and outcomes are correct prior to proceeding with system assessments.

For calibration of the hydraulic model, initial simulation runs will be made using estimated model parameters to ensure that the existing model results are reasonable and that there are no gross errors. Various calibration runs will then be made in steady-state mode and the model results will be evaluated for consistency with available data and field observations. If results are not reasonable, PBI will re-evaluate the adjustment parameters and re-run until a satisfactory match is obtained between modeled and observed values.

After an acceptable set of calibration parameters has been determined, PBI will examine the extent to which the set of calibrated values needs to be adjusted to match other steady-state demand simulations. In addition, to further refine the calibration, the calibration parameters will be used for time-varying conditions in an extended period simulation to see if there is reasonable agreement between modeled and observed pressures, flows, and tank water levels.

Depending upon the quality and quantity of available data, PBI will validate the model by running test data obtained under different conditions. For the validation, system demands, initial conditions, and operational rules will be adjusted to match the conditions at the time the test data was collected.

It is important to note that a discrepancy found during the calibration process can also mean that the system itself has problems. Possible problems include large leaks, unchartered services, previously undetected errors in the metered consumption, errors in recorded pipe sizes, unknown throttled or closed valves, worn pump impellers, or old construction debris left in pipes.

Additional Data Collection

During the calibration process, it may be determined that additional supplemental data needs are required in order to achieve accurate model calibration or validation. If necessary, PBI will identify key locations and areas where additional data is needed and work cooperatively with CPUD to gather the information. For example, certain valves may need to be checked to ensure that they are not partially

closed, or additional pressure readings may be needed in conjunction with tank level, pump station, and/or flow meter readings. In addition, supplemental fire flow tests will be conducted to ensure model accuracy during peak demand and fire flow conditions.

This level of effort is based upon prior experience and assumes that a total of 20 fire flow tests (2 tests per pressure zone) will be needed to support the calibration process. The fire flow tests are assumed to be performed with the assistance of CPUD operations staff and will take up to 3 days in the field with our Staff Engineer. The first two fire flow tests will include the attendance of our Project Engineer.

SCOPE OF WORK

Our scope of work, which was developed, based on our experience with similar projects, review of the request for proposal (RFP), and review of available information is detailed as follows:

Task 1. Project Management - PBI will provide overall project management activities to keep the project on schedule and within budget and report progress and milestones at regular intervals to District staff.

Task 1.1 General Project Management – Ashley Smith, project manager, will continuously review the project schedule and budget – if any deviations are identified Ashley will immediately notify the District and develop a corrective action plan to get the project back on schedule and within budget.

Task 1.2 Project Meetings – This task includes regularly schedule calls to ensure the updated master plan is completed in a timely and efficient manner. This task includes a standing weekly call with PBI's project manager and the District's project manager. We will provide an agenda for the weekly call to keep it efficient and effective. These calls can range from 5 minutes to 30 minutes depending on the topics needing discussion. Our experience has found these standing calls to be very effective in keeping all parties informed and help keep projects on schedule and on budget.

Task 1.3 Quality Assurance/ Quality Control – This task includes all quality assurance/control activities throughout the project design. All deliverables will be reviewed and approved by Tim Hasler prior to delivery to the District.

Task 1.4 Monthly Invoices and Progress Reports – This task includes the development of monthly invoices that will be accompanied with monthly progress reports. The monthly invoices will detail hours by staff and include all expenses. The monthly progress reports will summarize the services provided during the month, identify any outstanding issues, include monthly cost by task and identify the remaining budget.

Deliverables: *Meeting agendas (transmitted electronically), monthly invoices and monthly progress reports*
Assumptions: *Project will be completed within 6 months of NTP.*

Task 2. Review Prior WMP and Available Information

Task 2.1 Review Most Recent WMP - PBI was the author of the 2008 Water Master Plan therefore, this review will be minimal.

Task 2.2 Review and Collect Available Information - PBI will coordinate with District staff to obtain all data required for this review including but not limited to: maps, water usage data, planning and land use information, and any other pertinent information.

Task 2.3 Describe Study Area and Existing Water System -

Task 2.4 Review Current and Projected Water Demands – (to model the existing system)

Deliverables:
Assumptions: *District to provide all necessary information to review and update the model and the WMP.*

Task 3. Software Update and Model Development

Task 3.1 Update Software Model – PBI will update the software model to ensure that the model reflects the current operation of the system. (Software of most current model Innovyze)

Task 3.2 Develop Model – PBI will develop the model to determine water system constraints and to evaluate options for system improvements.

Task 3.3 Calibrate Model – PBI will calibrate the model after the existing conditions are updated.

Task 3.4 Model Development Report – PBI will develop a report to document all the work conducted as part of this project, including but not limited to, the model development and calibration process, as well as all criteria used and the modeling methodology.

Deliverables: *Model Development Report*
Assumptions:

Task 4. Water System Analysis - PBI will prepare an analysis to identify improvements required to the District's raw water distribution, raw water storage, water treatment and distribution system throughout the planning period.

Task 4.1 Develop System Evaluation Criteria – PBI will develop a System Evaluation Criteria to provide the basis for identifying problem areas in the water system over the planning period.

Task 4.2 Analyze Water System and Recommend Improvements – PBI will analyze the Water System and recommend improvements. Our analysis will include: average day demand, maximum day demand, fire flow, peak hour demand and include both current and build out planning scenarios.

Task 4.3 Perform Condition Assessment – PBI will perform a condition assessment of the water facilities to assess existing facilities and identify recommended improvements. CSI will perform a condition assessment of the existing clearwell at the water treatment plant.

Deliverables: *Condition Assessment Report*
Assumptions:

Task 5: Prepare 5-Year Capital Improvement Plan and 20-Year Asset Management Plan – PBI will conduct a workshop describing the infrastructure improvements that we have identified in Task 4.3. An annual schedule of recommended improvements will be included for implementation based on priority. Our recommended 5-year CIP will include estimated costs escalated to the year of actual implementation along with a summary of recommended projects and costs for each year of the CIP. We will also conduct a workshop describing the 20-year AMP similar to the workshop for the CIP. We will include estimated costs that reflect inflation at the year of implementation.

Deliverables:
- *5 Year Capital Improvement Plan (CIP) including costs*
- *20 Year Asset Management Plan (AMP) including costs*

Assumptions: *One workshop each for the CIP and the AMP*

Task 6 Prepare Updated Water Master Plan

Task 6.1 Administrative Draft Water Master Plan – PBI will develop an Administrative Draft Water Master Plan which incorporates all the key outcomes of prior tasks. Our report will include figures, maps, flowcharts, and diagrams to improve the understanding and access to the technical elements of the report.

Task 6.2 Prepare Final Water Master Plan – PBI will incorporate District comments from the Draft Water Master Plan and prepare the Final Water Master Plan.

Deliverables: *One (1) copy of the Draft and one (1) copy of the Final Water Master Plan*

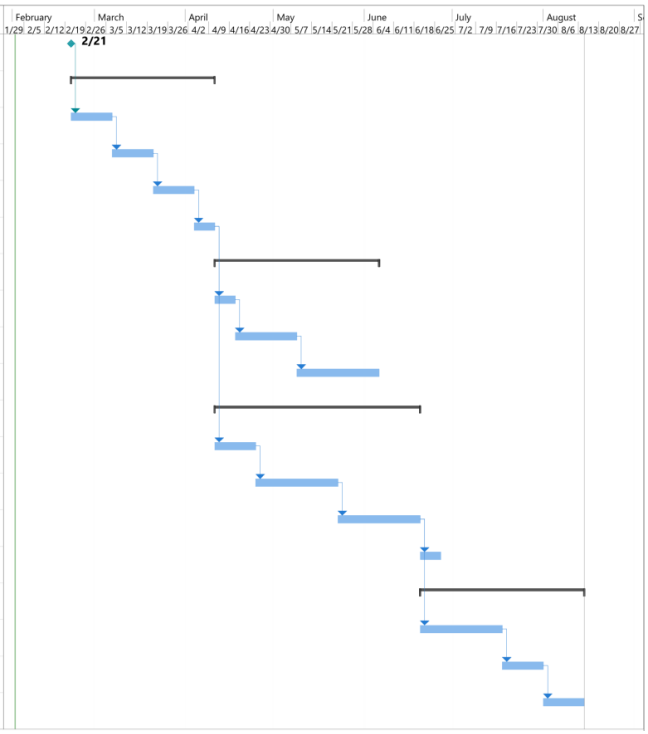
Assumptions:

- *The 5-year CIP and 20- year AMP will be included as appendices to the Draft and Final WMP.*
- *The Final Water Master Plan will be stamped by a registered Civil Engineer*

PROJECT SCHEDULE

Our proposed schedule is detailed below.

ID	Task Name	Duration	Start	Finish	Predecessors
1	Kick Off Meeting	0 days	Tue 2/21/23	Tue 2/21/23	
2	**Baseline Assumptions TM**	**35 days**	**Tue 2/21/23**	**Mon 4/10/23**	
3	Background Data Review	10 days	Tue 2/21/23	Mon 3/6/23	1
4	Draft Baseline Assumptions Memo	10 days	Tue 3/7/23	Mon 3/20/23	3
5	District Review	10 days	Tue 3/21/23	Mon 4/3/23	4
6	Final Baseline Assumptions Memo	5 days	Tue 4/4/23	Mon 4/10/23	5
7	**Hydraulic Model Update**	**40 days**	**Tue 4/11/23**	**Mon 6/5/23**	
8	Import existing model	5 days	Tue 4/11/23	Mon 4/17/23	6
9	Update system facilities	15 days	Tue 4/18/23	Mon 5/8/23	8
10	Calibrate Model	20 days	Tue 5/9/23	Mon 6/5/23	9
11	**Water System Analysis**	**50 days**	**Tue 4/11/23**	**Mon 6/19/23**	
12	Develop System Evaluation Criteria	10 days	Tue 4/11/23	Mon 4/24/23	6
13	Analyze Water System	20 days	Tue 4/25/23	Mon 5/22/23	12
14	Perform Condition Assessment	20 days	Tue 5/23/23	Mon 6/19/23	13
15	**Prepare 5-year CIP**	5 days	Tue 6/20/23	Mon 6/26/23	14
16	**Prepare Updated Water Master Plan**	**40 days**	**Tue 6/20/23**	**Mon 8/14/23**	
17	Administrative Draft Water Master Plan	20 days	Tue 6/20/23	Mon 7/17/23	14
18	District Review	10 days	Tue 7/18/23	Mon 7/31/23	17
19	Prepare Final Water Master Plan	10 days	Tue 8/1/23	Mon 8/14/23	18



INSURANCE REQUIREMENTS

PBI has the ability and agrees to fulfill the indemnification and insurance requirements listed in the sample Professional Services Agreement. Furthermore, our insurance limits meet or exceed the District required minimum coverages for Commercial General, Automobile, and Professional Liability as well as Worker's Compensation Insurance.

CONFLICTS OF INTEREST

Peterson Brustad Inc is not committed to a project or client that would constitute a conflict of interest, either existing or perceived, with Calaveras Public Utility District.

APPENDIX A – RESUMES OF KEY PERSONNEL

Karl B. Brustad, P.E.

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

Education
M.B.A., California State University, Sacramento

B.S., Civil Engineering, California State University, Chico

Registrations
Registered Professional Civil Engineer, CA No. 57869

Certifications
Grade 4 Water Treatment Operator, CA No. 22526

Certificate of Advanced Business Studies; CA State University, Sacramento

EXPERIENCE

Mr. Brustad is a founding principal of PBI and has more than 28 years of experience in the planning, design, and construction of water supply, water distribution, water storage, and water treatment systems. His experience includes groundwater and surface water treatment, storage tanks, pumping stations, pipeline distribution and conveyance, wells, master planning, flood control, telemetry, and SCADA. He is intimately familiar with a variety of water and wastewater modeling applications. Project experience includes:

WATER PLANNING

Irrigation System Renovation Plan - Hallwood Irrigation Company (HIC), Marysville, CA. 2022 – Present. HIC's irrigation system was constructed more than 100 years ago without the benefit of modern construction and has been subject to a patchwork of temporary repairs for decades. HIC has lacked the resources to conduct a thorough investigation or comprehensive repairs, the system remains plagued with many leaks resulting in excessive water seepage and water losses throughout the network. HIC recently received a community impact grant from Yuba Water Agency to support their efforts to improve the reliability of their system. PBI is providing a condition assessment to identify deficiencies in the irrigation system (Phase 1) and then will develop the appropriate construction documents (Phase 2) necessary to implement the proposed improvements (Phase 3).

Recycled Water Master Plan Update and Hydraulic Model, City of Folsom, CA. 2020 – Present. The City has recently expanded its service area to allow for future development projects in the areas south of Highway 50. The City is preparing for significant growth, particularly in the areas south of Highway 50. The major planned developments south of Highway 50 include the Easton Project and the Folsom Plan Area (FPA). PBI is updating the 2015 Folsom Plan Area (FPA) Non-Potable Water Analysis 2.0 (2015 Analysis) in conjunction with developing a hydraulic model for the non-potable water distribution system. The Plan will include evaluation and sizing for existing infrastructure and planned backbone infrastructure.

Upper Mokelumne River Watershed Sanitary Survey Update – Calaveras County Water District, San Andreas, CA. 2021. PBI prepared the first Watershed Sanitary Survey (WSS) for the Upper Mokelumne River in 2011, then completed an update to that WSS in 2016. In 2021 PBI completed another 5-year update to the Upper Mokelumne River Watershed Sanitary Survey (WSS). The objectives of the watershed sanitary survey include: meeting the State Water Resources Control Board, Division of Drinking Water (DDW), Surface Water Treatment regulatory requirements, assessing conditions in the watershed that have the potential to impact raw water quality at the surface water treatment plants, analyzing the past five years of raw and treated water quality data to determine the treatment required to meet current and future drinking water regulations, and identifying watershed management practices that have the potential to reduce contaminants in the watershed.

Transmission Main Evaluation – Fair Oaks Water District, CA. Prepared a study to assess the current condition of FOWD's transmission mains. Included development of alternatives for rehabilitation, abandonment, and replacement of the system. The evaluation concluded with a recommended alternative and a capital improvement plan for implementing that alternative.

2016 Water Master Plan Update and Urban Water Management Plan, City of Folsom, CA. PBI provided data review and analysis, development of demand projections, analysis of demand management measures, population and demographic analysis, system supplies, water supply reliability, water shortage contingency planning, climate change, and other factors. Updated hydraulic models for existing, intermediate, and build out scenarios. Evaluated the water system relative to current and future water demands

consistent with 2015 Urban Water Management Plan and identified system improvements. Developed 10-year Capital Improvement Program including cost estimates. Prepared draft and final reports.

Recycled Water Master Plan Update and Hydraulic Model, City of Folsom, CA. Project Manager. Updated the 2015 Folsom Plan Area (FPA) Non-Potable Water Analysis 2.0 (2015 Analysis) in conjunction with developing a hydraulic model for the non-potable water distribution system. The Plan will include evaluation and sizing for existing infrastructure and planned backbone infrastructure.

2020 and 2015 Urban Water Management Plan – Fair Oaks Water District (FOWD), Fair Oaks, CA. PBI recently completed the 2020 UWMP for the assessment of all water utilities in Fair Oaks. Previously had prepared in its entirety, the 2015 UWMP per California Water Code. Providing analysis for the current system and its efficiency and designing a master plan that would be capable of satisfying the demand from the system. Evaluated all aspect of the UWMP sections including water supply and demand for existing and future build-out scenarios, water shortage contingency planning, system supplies, and other factors. Designing a plan for the construction and maintenance needed to be done to get the system to this level of operation.

Folsom Plan Area (FPA) Hydraulic Model Update - City of Folsom 2018 to Present. Integrating planned South of Highway 50 FPA and existing developments into the City's hydraulic model and redistributing demand data to new development by land type. The model runs tests to confirm acceptable importation of new infrastructure. An intermediate model was developed to simulate temporary operation conditions prior to the Zone 4 tank being constructed.

Water System Model Update and On-Call Modeling Support – Fair Oaks Water District (FOWD), Fair Oaks, CA. Project manager supporting water system modeling of fire flow tests. Reviewed background information provided by FOWD to develop understanding of overall operation of the water system. Identified control settings against consistency with background information. Verified that the model was calibrated using the pre-drought fire flow data provided by FOWD in advance of updating model demands. Allocated demand by land use using Sacramento County land use data and demand factors. Developed a Technical Memo describing results of the model verification and updated system demands. Provided recommendations to maintain model information moving forward.

Upper Mokelumne River Watershed Sanitary Survey Update – Calaveras County Water District, San Andreas, CA 2016. PBI prepared the 5-year update to the Upper Mokelumne River Watershed Sanitary Survey (WSS). The objectives of this watershed sanitary survey include: meeting the State Water Resources Control Board, Division of Drinking Water (DDW), Surface Water Treatment regulatory requirements, assessing conditions in the watershed that have the potential to impact raw water quality at the surface water treatment plants, analyzing the past five years of raw and treated water quality data to determine the treatment required to meet current and future drinking water regulations, and identifying watershed management practices that have the potential to reduce contaminants in the watershed.

On-Call Modeling Support Services - City of Folsom 2016 to Present. Water System Importing for Folsom Plan Area Developments into model and modeling of fire flow tests.

2018 Updated Master Plans and Rate Studies for Ebbetts Pass, Copper Cove and Jenny Lind - Calaveras County Water District (CCWD), San Andreas, CA. Project manager for the development of water master plans for the Jenny Lind, Copper Cove, and Ebbetts Pass water service areas. The master plan addressed existing and projected future demands, future water supply sources, existing and known future regulatory requirements, limitations to the current treatment process and capacity, alternative

treatment processes, facility deficiencies, limitations of current facility communications, identification of flaws in security at facilities, and identification of facility improvements and timelines for those improvements. Developed capital improvement projects including: storage tanks, treatment facilities, booster pump stations, and distribution system piping. Evaluated existing capacity charges and made recommendations for new updated charges. Estimated costs for build-out conditions.

Generator Improvements 2013 - California American Water, Sacramento, CA. Project manager for the assessment of the emergency generators throughout all of the Cal Am water systems. Reviewed the status of all generators owned and operated by Cal Am, considering their condition, permit status, and positioning in order to optimize the output of the generators in the case of an emergency. Provided a report for the recommendation of relocating, renovating, replacing, or purchasing of new generators in order to keep the wells meeting the level of demand for each system.

Jenny Lind Water Distribution System Model Calibration – Calaveras County Water District San Andreas, CA. Principal. Performed hydraulic model calibration using H2O Map for existing system to reduce water age and improve flow of water in selected portion of distribution system. Also evaluated hydraulic model for system improvements for CIP planning, which included evaluating existing facilities, projecting population growth and water demands, and performing fire flow analyses. Performed emergency low-water modeling to troubleshoot system's water distribution. Evaluated pressure reducing valve settings and interaction to maximize water distribution efficiency and restore pressure zones.

2010 Urban Water Management Plan – Georgetown Divide Public Utility District, Georgetown, CA. Project Manager for the preparation of the District's 2010 UWMP. Work included: evaluating effectiveness of existing best management practice, developing baseline water use, population projections, target water use, and water supply contingency plans. Benefit cost analyses were presented for demand management measures that were not implemented by the District. Presented UWMP to GDPUD Board of Directors.

2005 Ebbetts Pass Water Master Plan - Calaveras County Water District (CCWD), San Andreas, CA. Project manager for the development of a water facility and financial master plan for the Ebbetts Pass water service area, which consisted of 15 pressure zones with numerous subzones, 17 water storage tanks, 10 pumping stations, over 40 miles of transmission mains, and over 100 pressure reducing stations. The master plan addressed existing and projected future demands, future water supply sources, existing and known future regulatory requirements, limitations to the current treatment process and capacity, alternative treatment processes, facility deficiencies, limitations of current facility communications, identification of flaws in security at facilities, and identification of facility improvements and timelines for those improvements. Operation and maintenance issues that were evaluated include tank and pipe leaking, improper or nonfunctioning pressure reducing valves, Haloacetic Acid (HAA) formations in the water, and pressure regulation. The project, which involved hydraulic modeling of the system, was performed using H20Map, 20-year life cycle cost analysis, and preparation of a financial plan to fund the construction of a phased capital improvements program and to replace facilities due to age or new regulations. The financial plan served as the basis for adoption of new connection fees and replacement surcharges.

2005 Jenny Lind Water Master Plan - Calaveras County Water District (CCWD), San Andreas, CA. Project manager for the development of a water facility and financial master plan for the Jenny Lind water service area. The master plan addressed existing and projected future demands, future water supply sources, existing and known future regulatory requirements, limitations to the current treatment process and capacity, alternative treatment processes, facility deficiencies, limitations of current facility

communications, identification of flaws in security at facilities, and identification of facility improvements and timelines for those improvements.

2005 West Point and Wilseyville Water Master Plan - Calaveras County Water District (CCWD), San Andreas, CA. Project manager for the development of a water facility and financial master plan for the West Point-Wilseyville water service area. The master plan addressed existing and projected future demands, future water supply sources, existing and known future regulatory requirements, limitations to the current treatment process and capacity, alternative treatment processes, facility deficiencies, limitations of current facility communications, identification of flaws in security at facilities, and identification of facility improvements and timelines for those improvements.

Generator Master Plan and Generator Improvements Project - California American Water (Cal Am), Sacramento, CA. Provided program management services for Cal Am's generator program. Provided civil and electrical design for new and replacement generators. Developed generator master plan that identified capital improvement needs. Acquired necessary permits including Sacramento Metro Air Quality Management District. Managed procurement and installation of natural gas services from PG&E.

Water Master Plan – Calaveras Public Utility District, San Andreas, CA. Performed a system-wide hydraulic model run representing approximately 3,000 rural customers in mountainous terrain. Developed a master plan for a 20-year planning period.

Water Master Plan for Antelope System - California American Water (Cal-Am), Sacramento, CA. Prepared a water system master plan for Cal-Am's Antelope system, which consisted of approximately 15 wells and over 12,000 service connections. Hydraulic model of the water distribution system was developed and calibrated.

Water Master Plan for West Placer County System - California American Water, Sacramento, CA. Developed hydraulic model for future development of approximately 20,000 service connections. Model utilized interties with other systems, along with multiple tank and booster facilities to provide surface water to the area.

Water Master Plan for Suburban System - California American Water (Cal-Am), Sacramento, CA. Prepared a water system master plan for Cal-Am's Suburban system, which consisted of approximately 15 wells and over 20,000 service connections. Hydraulic model of the water distribution system was developed and calibrated.

Water Master Plan for Larkfield and Mountain Districts - California American Water (Cal-Am), Sacramento, CA. Prepared a water system master plan for Cal-Am's Larkfield and Mountain Districts. Each system includes up to 10 wells, a water treatment plant, and over 12,000 connections. Hydraulic models of the water distribution systems were developed and calibrated.

Water Master Plan for Lincoln Oaks System - California American Water (Cal-Am), Sacramento, CA. Prepared a water system master plan for Cal-Am's Lincoln Oaks system, which consisted of approximately 12 wells and over 12,000 service connections. Hydraulic model of the water distribution system was developed and calibrated.

Water Master Plan for Parkway System - California American Water (Cal-Am), Sacramento, CA. Prepared a water system master plan for Cal-Am's Parkway system, which consisted of approximately 10 wells, three water treatment plants, and over 12,000 service connections. Hydraulic model of the water distribution system was developed and calibrated.

Water Supply Feasibility Study - Calaveras County Water District (CCWD), San Andreas, CA. Project manager for a study that evaluated the feasibility of improvement projects identified in the 1996 master plan. Projects studied included Wilson Lake embankment replacement, Bummerville treated water storage and distribution system, Bear Creek diversion and raw water pipeline, West Point and Wilseyville water distribution system, Middle Fork Mokelumne River intake and pump station, and

Regulating Reservoir intake and spillway. Prepared feasibility report summarizing recommendations and reviewed 30 percent designs of improvements. Improvements included 8,400 linear feet (LF) of 16-inch-diameter raw water pipeline for Bear Creek diversion, dam raising improvements for Regulating Reservoir to regulate flows, Wilson Lake dam replacement, 250,000-gallon and 1-million-gallon water storage tanks, instream infiltration gallery for Middle Fork Mokelumne River pump intake, and 4,400 LF of 10-inch-diameter raw water forcemain.

Spill Prevention (SPCC)- Sacramento Suburban Water District (SSWD), Sacramento, CA. Project manager for the review of the Spill Prevention Control and Countermeasure plans for the Walnut Grove and Antelope water systems. Implemented the plans and led training sessions for all of the District staff for these systems. Provided a copy of the plans to each member and gave them proper training for continued maintenance of the facilities in the systems.

Parkway Emergency Generators - California American Water, Sacramento, CA. Project manager for the design and planning for the installation of emergency backup generators in the Parkway water system. The planning required coordination with SMUD, as well as Cal Am to ensure that the generators would produce the proper output from the wells that they run. The generators are able to power wells large enough to meet the water demand for the system, and also have enough distribution so that they are spread across the SMUD power grids.

WATER DISTRIBUTION AND PIPELINES

Vista Burns Backyard Main Replacement Project – California American Water (Cal Am), Sacramento, CA. 2022 – Present. The Vista Burns Backyard Main Replacement Project includes the installation of approximately 13,700 feet of new front yard water mains, associated meters, and related appurtenances. Design services include: field survey, design document preparation, and preparation of permitting documentation for the encroachment permit and Department of Drinking Water (DDW) variance request letter for pipeline crossings and separations. This project was identified as next in line by utilizing historical main break records in combination with input from operations staff.

Covey Road Pipeline Replacement Project – Placer County Water Agency (PCWA), Auburn, CA. 2022 – Present. This project is to replace a section of existing 12-inch techite pipe in the water distribution system located in the Bowman area, just north of Auburn, on Covey Road, Placer County. The Agency plans to replace approximately 650 LF with a new pipeline on Covey Road, west of Edgehill Lane, in the Bowman pressure zone (HGL=1797). The new main size will be either 10 or 12-inch, to be determined by the Agency. Approximately 15 existing services are expected to be re-connected to the new pipeline when completed, and the project design should include new service connections and meter/meter box installations to properties located along this section of pipeline. Some existing meters are master meters to private service lines serving multiple customers, and are larger than the typical 5/8-inch residential meter. Project includes testing for corrosive soils, cathodic protection, utility coordination, permitting support, bid assistance and engineering support during construction.

Liz Taylor Flume – PCWA, Auburn, CA. 2022 – Present. The Liz Taylor flume is on RR property and thus requires an easement to complete the work. PBI is performing and provide hydraulic calculations to show that invert siphon, demo plan of existing flume, Inlet and outlet structures as well as blow off and manway access hatch at low spot in siphon. Plan and Profile of new piped portion, Plan set to be submitted to UPRR for approval. Project includes survey and permitting assistance.

2020 Priority Mains Replacement Project - California American Water (Cal Am), Sacramento, CA. Project manager for design services to install new front yard mains with new front yard services and meter boxes for the Sampson-Dewey project area.

Design includes specifications and drawings for approximately 13,500 feet of new front yard mains, associated services and meters, and related appurtenances. Project includes field survey, proposed utility crossings and Department of Drinking Water variance approvals, permitting support, and bid and construction support services.

Fruitridge Vista Water System 2021 Backyard Drop-In Meters – Cal Am, Sacramento, CA. 2021 – Present. PBI provided the design of approximately 330 backyard and front yard drop-in water meters and new service laterals. The project includes: the development of design plans and specifications, permitting, and bid assistance. Project is currently in construction and PBI is providing construction support services.

2021 Backyard Main Replacement Project - California American Water, Sacramento, CA. Project manager for design services to relocate backyard mains and services to front yard. New front yard mains include service laterals, meters and boxes, hydrants, and related appurtenances. Design includes specifications and drawings for approximately 15,500 feet of new water mains and 330 service laterals and meter installations. Project includes field survey, proposed utility crossings and Department of Drinking Water variance approvals, encroachment permit and permitting support, and construction support services.

Fruitridge Vista 5 Year Meter Replacement Project - California American Water, Sacramento, CA. Project manager for design of approximately 575 meters to be installed at those services that already have front yard service lines. Design of approximately 575 drop-in meters and 570 new front yard service connections as conversions from back yard mains. Design documents include drawings and specifications. Project includes identification and support of permitting needs including County Encroachment permit for new front yard service connections. Project includes engineering services during construction including: bid support, submittal review, RFI review, and preparation of As-Built drawings.

Dutch Flat Mutual Consolidation Project - Placer County Water Agency (PCWA). The objective of the project was to connect PCWA's Alta water system to the Dutch Flat Mutual water system, bring the Dutch Flat Mutual water system up to current design standards and ultimately dissolve the mutual water system with the consolidation of the two systems. Developed preliminary design report assessing alternatives for the consolidation of Dutch Flat Mutual. Design included plan and profile sheets for approximately 2-miles of water distribution pipelines ranging in size from 10" to 8" to replace the existing undersized and failing distribution system: intertie the two systems, install tank control valve, SCADA, pressure reducing station, and replacement of approximately 10,000lf of water mains. Utilized potholing and USA markings from geotechnical effort to identify locations of existing utilities. Design included replacement of water services and in many cases required modified connections to the existing customers. Included permitting coordination with the Department of Drinking Water and Placer County.

Oak Avenue Parallel Pipeline Project – City of Folsom, CA. Providing design services to eliminate the need for emergency storage at the Oak Avenue pump station and would like to divert flow through a parallel pipeline. Project design includes the development of plans and specifications for the construction of the Oak Avenue Parallel Pipeline. Project includes coordination of survey, right of way, and environmental services. Project will also include bid support and construction support services.

Foresthill Road Pipeline Replacement Project - Foresthill Public Utility District. Project included the design of approximately one mile of 12" diameter water main in Foresthill Road to replace an old failing main. Included installation of new meters and service lines for approximately 35 homes. Design included existing utility location research and inclusion into the design along proposed pipe alignment. Design included applicable detail sheets, including pipeline appurtenances, trenching, and detailed tie-in

plans. Included permitting coordination with the Department of Drinking Water and Placer County. Project included bid support and construction management services.

Mosquito Ridge Road to Thomas Street Pipeline Project - Foresthill Public Utility District (FPUD). Design of 6,200 feet of replacement pipeline along Foresthill Road between Mosquito Ridge Road and Thomas Street. Includes 600 feet of replacement pipeline along Sierra View Lane. Improvements will include all necessary valving, separation, hydrants, and service connections to all allow the District to abandon the existing main. Includes the development of a set of improvement plans and includes providing a complete set of written construction specifications for the proposed pipeline. Project includes: survey services, bidding support, and construction management services.

Transmission Main Evaluation – City of Roseville, CA. Project Manager for the development of a full desktop evaluation utilizing a risk-based approach for all of the transmission mains within the City of Roseville. Conducted collaborative workshops with City Staff to develop the desktop evaluation.

Trussel Plant Offsite Improvements Project – Golden State Water Company. Project manager for the planning and design to provide piping for drainage of surface runoff and well water discharge. Provided water main connection to existing main in a residential street. Design included street improvements. Project included permitting, and right-of-way support.

Keena-Bell Pipeline Project – Placer County Water Agency, Auburn, CA. Project objective was to replace and relocated a failing cross country water main and place within County and private roads. PBI provided design services for the installation of 2,200 ft of new 18" transmission line to replace an aging 14" pipeline. Project was mostly through private property and required reconnection of existing water services. Project included permitting coordination with the Department of Drinking Water and Placer County and public outreach to coordinate proposed improvements with property owners and assist PCWA with development of permanent and temporary construction easements.

Ophir Road Pipeline Project – Placer County Water Agency, Auburn, CA. Provided design services for the installation of 2,200 ft of new 12" transmission line. Completed design in less than three months to allow new water service to a community with a failing well. Design included traffic control plans, Placer County encroachment permit, and coordination with Placer County.

Bradshaw Road Pipeline – California American Water (Cal Am), Sacramento, CA. 2010 - 2011. Provided preliminary design, permitting, utility coordination, and attended project meetings for the design of 1,400 lineal feet of 12-inch transmission main pipeline to improve system efficiency and performance. The pipeline is to connect two existing 12-inch dead-end mains and connect to the Suburban and Rosemont water systems. The project was in an area with congested utilities and involved extensive coordination with other agencies. The design was based on several criteria including: cost, constructability, encroachment/right of way, existing utility locations, traffic control, accessibility, and hydraulic efficiency.

Red Ravine Siphon – Placer County Water Agency, Auburn, CA. Designed approximately 1,000 feet of 24-inch raw water main to replace and relocate existing main that has deteriorated and is prone to leaks. Project included utility coordination, permitting services, and engineering support during bidding.

Channel Hill Neighborhood Water System Improvements – Placer County Water Agency, Auburn, CA. Principal in charge of design for 1,200 linear feet (LF) of 6-inch diameter ductile iron pipe to convert an existing neighborhood to a higher pressure zone. Designed for demolition of unused facilities and clean up of piping connections. Coordinated with Placer County to obtain Encroachment Permit. Prepared design of multiple private service pipelines. Coordinated preparation of plats and legal descriptions

for temporary and permanent easements. Coordinated re-construction of past easements and exceptions to resolve deed / easement mismatch.

Highway 20 Pipeline Infrastructure Realignment Project – Browns Valley Irrigation District (BVID), Browns Valley, CA. PBI developed plans and specifications for the relocation of approximately 5,620 feet of pipeline including three Highway 20 crossings. The new HDPE pipeline was designed to replace those impacted by the Highway 20 realignment. Project included the development of traffic control plans, assistance with bidding, and providing engineering support during construction. Prepared As-built drawings.

Sicard Pipeline Project – Browns Valley Irrigation District (BVID), Browns Valley, CA. The objective of the project was to pipe approximately 10 miles of an open ditch system (Sicard Flat Ditch) to eliminate water loss from the ditch and improve service to customers. PBI developed a planning study to determine build out pipeline sizing and to identify preferred alignments. The project was broken up into 6 phases and included a detailed construction sequencing plan as the construction had to occur during limited windows between October and April to avoid impacting the seasonal irrigation demands. The design included plan and profile design sheets and specifications for the construction of approximately 9.6 miles of new 48" to 24" pipeline. The alignment included cross country, dirt roads, county roads and the existing ditch.

Crestridge Lane Pipeline Replacement – City of Folsom, Folsom, CA, 2014. Developed plans and specifications of a new water pipeline that will replace a privately owned pipeline serving approximately 40 homes in a community built on a single parcel. Design included installing individual water meters at each home which were originally served through one meter at the bottom of the parcel. Construction manager for the replacement of this pipeline.

Historic District Utilities Rehabilitation– City of Folsom, Folsom, CA. Designed over 6,000 feet of 8-inch water main and over 1,000 feet of 8-inch sewer main to replace old mains. Developed plans and specifications for the project, including traffic control plans. Provided engineering support during bidding. Provided construction management services including progress payment review, submittal review, RFI's, contract change orders, weekly construction meetings, and as-built plans.

Relocation of Water Lines for the I-80 Auxiliary Lanes Project – City of Roseville, CA. The I-80 Auxiliary Lanes Project has three storm drain crossings that conflict with the City's distribution water mains that will require relocation. PBI is developed the relocation plans for three conflicting water lines so they could be incorporated into the Caltrans contract documents for I-80 auxiliary lanes project.

Golden State Water Intertie Pump Station and Pipeline – City of Folsom. Project manager for the feasibility study, design, and installation of 1,800 feet of pipe to connect Intertie pump station with the City of Folsom system. Required the coordination of Folsom, Easton, and intertie pump stations designed to tie the utilities of each together into the City of Folsom water system. Managed the whole process, including feasibility studies, designs, and as build designs.

Lower Wikiup Pipeline – California American Water (Cal Am), Sacramento, CA. 2009. Designed over 900 LF of water pipeline in a narrow right of way requiring special permissions from California Department of Public Health (CDPH) for installation. Also included construction management services.

Highway 26 Transmission Line Extension – Calaveras County Water District, Jenny Lind, CA. Principal. Prepared design for over 7,300 linear feet (LF) of 12-inch diameter ductile iron pipe. Coordinated with CalTrans and Calaveras County to obtain Encroachment Permits. Coordinated design of four pressure reducing stations. Developed traffic control plans. Provided bid-period services including pre-bid meeting, addenda, RFI responses, and also provided engineering services during construction including

submittal review, responding to RFIs, and provided opinion on construction change orders.

Ebbetts Pass Reach 3A Pipeline Technical Review and Hydraulic Modeling - Calaveras County Water District, San Andreas, CA. Provided assistance to CCWD with development of the project design including: project deliverables, plans, specifications, and cost estimate. Updated and utilized the Innovyze InfoWater hydraulic model of water system to develop the construction sequencing plan. Provided evaluation of several miles of Ebbetts Pass transmission mains to prioritize improvements by reach – each reach varied in length from one to five miles.

Loomis Basin Pipeline - Placer County Water Agency. Provided QA/QC services for plans and specifications for 14 repairs to existing 24-inch diameter treated water pipeline. Managed development of traffic control plans and ROW acquisitions. Completed Caltrans and Placer County encroachment permit applications.

Backyard Main and Meter Retrofit Project – City of Sacramento. Project manager for design of improvements to replace backyard mains with mains located within the public right-of-way and the installation of new water services with meters. Project included over 50,000 LF of new water mains and approximately 1,000 new water services with meters.

Isleton Distribution System Improvements – California American Water. Established methods required to abandon in-place water pipes in levee. Designed plans and specifications for the construction of new pipelines and water service connections through levee. Coordinated and supported permitting efforts with descriptions and figures to obtain all necessary permits. Provided engineering support during bidding and construction.

Larkfield Pipelines Project – California American Water. Provided design and engineering support during construction for the Larkfield Pipelines Project. Services include: identify potential utility conflicts that may be located within the vicinity of the project, development of plans and specifications adequate for the construction of the Larkfield Pipelines, obtaining permits as identified, participate in the bidding process including: pre-bid walk through, response to question, and preparation of addendum. Provide engineering support during construction.

Elverta Road Bridge Main Replacement, (Antelope System) - California American Water, Sacramento, CA. Project manager for preparation of a basis of design report (BODR) for the Elverta Road Bridge Main replacement project, which involved removal and replacement of approximately 280 lineal feet (LF) of 12-in-diameter water main attached to the Elverta Road Bridge.

Water Distribution and Fire Protection System Improvements for Grant Grove and Lodgepole Areas of Sequoia and Kings Canyon National Parks – National Park Service, Three Rivers, CA. Project Manager. Participated in a scoping meeting, coordinated with the surveying subconsultant, and provided preliminary design services for improvements to reconstruct major components of the water distribution systems in the Grant Grove and Lodgepole areas of the Sequoia and Kings Canyon National Parks. Project involved removing and replacing approximately 33,100 linear feet (LF) of water pipelines ranging in size from less than 1 to 10 inches in diameter that were old, deteriorated, and failed on a regular basis.

Copper Cove Water System Zone C Pumping Station and Transmission Main Improvements - Calaveras County Water District, San Andreas, CA. Project manager for preliminary design and final design of a new 2,000 gpm (4,500 gpm buildout) water pumping station and approximately 10,000 linear feet (LF) of 20-inch-diameter water transmission main.

Eldridge-Madrone Pipeline - Sonoma County Water Agency, California. Project manager for design of approximately 8,500 linear feet (LF) of 27-inch-diameter mortar-lined and coated steel pipe. Design included: connections to existing piping facilities, valves, cathodic protection, and appurtenances.

On-Call Engineering for Capital Improvement Projects - California American Water Company, Sacramento, Placer, Sonoma, and San Mateo Counties, CA. Project manager for on-call contract to provide preliminary design, design, and construction management services for miscellaneous projects as part of the capital improvements program. Projects included: West Placer County Development projects (four miles of 12- to 18-inch-diameter water distribution mains), new pipelines and pipeline replacements for Larkfield District and in multiple service areas located within Sacramento County, two trenchless technology crossings, and multiple state highway crossings (Highway 1, Highway 99, and two at Highway 50). Also provided permitting assistance, which included acquiring permits through direct coordination with local agencies (Caltrans, Sacramento County, and San Mateo.

Montara District Year 2 and Year 3 Fire Flow Improvements for Pipeline Replacements - California American Water, Montara, CA. Designed and provided construction management for 19 pipeline replacement projects identified in the 1996 master plan.

Alta Vista Raw Water Main and Overflow Improvements - California American Water, Montara, CA. Project manager for design and construction of 3,000 linear feet of 6-inch-diameter water main as well as piping system to capture all overflow outlets at the Alta Vista Water Treatment Plant and direct overflows to the Alta Vista drainage system. The project satisfied San Mateo's requirements identified to update the system use permit. As a separate project, prepared an erosion control and bank stability plan to repair existing slope failure areas and mitigate for potential future stability issues for a defined reach along the Alta Vista Raw Water Main's access pathway.

Water Distribution Reliability Predesign and Treatment Plant Failure Mode Analysis - Edgewood Water Company, Edgewood, Nevada. Evaluated alternatives for providing redundant treated water supply to improve the reliability of the water distribution system and designed an intertie between the 14-inch-diameter water distribution main and 14-inch-diameter water main supplying the Embassy Suites' fire protection system. The intertie included approximately 20 linear feet of 14-inch-diameter water main and one manually operated valve.

Parkway Booster Pump Station and Water Main - California American Water, Sacramento, CA. Project manager for design and construction of a 6,000 gpm booster station and two miles of 16- to 18-inch-diameter water main for a Sacramento County system to introduce surface water and fulfill conjunctive use requirements. Pipeline crosses Highway 99, adjacent to Morrison Creek. Oversaw consultant activities, developed and tracked project costs and schedule for budget and schedule management, evaluated project solutions, and acquired permits. Provided construction management services, including attendance at weekly status meetings; review of submittals, requests for information (RFIs), change orders, and final as-built drawings; documentation management; monthly status reports; and photo documentation. Also provided onsite construction inspection of the foundation, concrete, formwork, rebar, and compaction testing.

Montara District Pipeline Replacement Program - California American Water, Montara, CA. Project manager for design, construction management, and environmental documentation and permitting of over two miles of pipe for the Montara District Pipeline Replacement Program. Program involved 13 pipelines ranging in size from six to 12 inches in diameter. Permits include Coastal Development Permit, Department of Fish & Game permit, U.S. Army Corps of Engineers Section 404 permit, San Mateo County encroachment permit, and Caltrans encroachment permit. Oversaw preparation of Initial

Study and biological report, which enabled San Mateo County to prepare the Mitigated Negative Declaration. Project included three trenchless technology crossings. Microtunneling was utilized for alignment adjacent to highway and creek crossings.

Miscellaneous Water Main Projects - California American Water Company, Sacramento, CA. Designed multiple main projects ranging in size from 6 to 24 inches in diameter. Performed thrust analysis in designing joint restraints and deflections. Calculated distributed loads on rigid and flexible pipes for pipelines crossing beneath train tracks, parking areas, and conflict areas requiring minimal cover. Performed hydraulic analysis of closed circuit pipelines using H20Net and CYBERNET to select optimum pipeline sizes and locations.

Miscellaneous Water Distribution and Storage Projects at Barstow and Yermo Military Bases - U.S. Navy, CA. Provided design and construction management services for three reinforced concrete pads, over 35 wells, and over 15 miles of pipelines. Responsible for tracking all costs of the project: labor, equipment, subcontractors, etc., on a computerized project tracking system. Also inspected pipeline construction, backfill material, and bedding material; as well as tank foundation, ringwall, coating, concrete, and rebar. Estimated construction cost: $4 million.

WATER STORAGE AND PUMPING FACILITIES

Water Supply Project – Northern California Tribe. The first task for this project was the preliminary and 30% design of a floating intake and approximately 1.2 miles of water transmission main. The preliminary design report confirmed design criteria and identified recommended improvements. The 30% design was completed and a construction cost estimate was provided to the Tribe for the proposed improvements. Project includes the design of a 30,000 gallon/day water treatment plant, two water storage reservoirs (approximately 500,000 gallons each), one break tank, and one clearwell. The sizing of these facilities will be based on updated water demands and allow for the preparation of a preliminary design report to determine the design criteria for this project. Additionally, PBI will investigate the viability of pumping groundwater to the Tribal property in order to meet its immediate needs for drinking and fire suppression water until the planned Water Supply Project becomes on-line. An assessment will be made of the viability of utilizing the Tribe's existing wells and if necessary, design, permit, and locate additional wells including recommending the location for drilling additional wells and integrating the new wells into the existing water distribution system. An assessment will also be made of the general condition, water quality, and capacity of existing wells. Project includes permitting support for new and/or refurbished wells.

Security Park Pump Station Pump Replacement Project – California American Water (Cal Am), Sacramento, CA. 2022 – Present. Cal Am's Security Park Water System (System) includes one well (Well 2) and one pump station. The pump station includes two 1,000 gpm high flow pumps and two 300 gpm normal duty pumps with soft starters. A 150,000 gallon storage tank is also located at the pump station site. The two existing high flow pumps were installed in the 1950's and have exceeded their useful life; both pumps need to be replaced to increase the reliability of the pump station and ensure adequate water supply reliability under low system pressure. The scope of services includes the development of a set of improvement plans and specifications for the pump replacement, along with construction support services.

Capehart Tank Structural Analysis and Condition Assessment – Sacramento Suburban Water District (SSWD), Sacramento, CA. 2022 – Present. PBI provided a technical memorandum summarizing the peer review of the Capehart Tank structural analysis to determine if the reservoir meets current code requirements. Provided recommendations for rehabilitation of Capehart 150,000 gallon elevated water storage tank to improve structural components of the reservoir. The condition assessment is being done to provide a detailed reservoir evaluation of the interior (lining), exterior (paint) coatings, etc.

Findings are being summarized in a report including rehabilitation recommendations and preliminary cost estimates for improvements.

Meadowbrook 1MG Tank and Booster Pump Station – California American Water (Cal Am), Sacramento, CA. 2022 – Present. Cal Am's Meadowbrook Water System currently includes no storage; operational capacity is adequate, but peak hour demand equalization and maximum fire flow standards are not being provided in accordance with Title 22. To meet both Title 22 requirements and Cal Am planning criteria, a 1 million gallon (MG) storage tank and booster station (Facility) is necessary. The new facility will include a 1 MG welded steel storage tank and 2,000 gallon per minute (gpm) booster station (two 1,000 gpm pumps and two 500 gpm pumps) located at the existing Well 4 site. The scope of services includes the development of a set of improvement plans and specifications for a fully operational facility. This project includes structural, electrical, and geotechnical services. Bid and permitting support services are also included.

Monte Vista Tank Replacement Project – Placer County Water Agency (PCWA), Auburn, CA. 2022 – Present. The Agency has identified an existing redwood tank in the Monte Vista water distribution system that needs to be replaced with a new welded steel storage tank. The current capacity of the existing Monte Vista tank is 60,000 gallons. The Agency desires additional storage capacity at Monta Vista, therefore our design will be based on providing one 100,000 gallon capacity tank at Monte Vista. The Monte Vista tank site is owned by the Agency as well as an adjacent parcel to the existing tank site, which is adequate for locating one new 100,000 gallon tank and a second future 100,00 gallon tank. This project includes bid support and construction support.

Hardrock Lane PRV Station Project – Foresthill Public Utility District (FPUD), CA. 2021 - Present. The project consists of the pre-design, design, and construction administration services for four pressure reducing stations and associated piping located with FPUD's distribution system. Performed preliminary field Investigative work to identify potential construction alternatives and establish the initial and long-term planning and design options for the different phasing alternatives of development. The PRV stations will be planned and designed to work with the FPUD's existing distribution system pressure zones. Project includes coordination with other utilities within the project area and bidding and construction support services.

Engineering Services for Condition Assessment of Watt-Elkhorn Reservoir – Sacramento Suburban Water District (SSWD), Sacramento, CA. 2021 – Present. PBI is providing a detailed condition assessment of the 5M gal Watt-Elkhorn Reservoir. The purpose of this condition assessment will be to conduct a detailed tank evaluation of the interior and exterior coatings, cathodic protection (CP) system, and structural components. The coatings evaluation will include a thorough inspection to evaluate the condition of the interior and exterior coating systems and note the level of visual degradation present and any other defects. The CP system will be assessed and recommendation(s) provided for rehabilitation. The detailed structural evaluation of the tank will include non-destructive testing (NDT) of plate thickness and welds, and will be based on current standards as set forth in AWWA D100-11 – Welded Carbon Steel Tanks for Water Storage.

Reservoir 1 Storage Analysis – El Dorado Irrigation District (EID), Placerville, CA. 2021 – Present. PBI is performing a storage evaluation of their service area utilizing the District's InfoWater models for all modeling efforts. Project includes evaluating current storage status and reviewing current system and operational status, and identifying limiting characteristics in the current system including reservoir sizing and water quality analysis. The evaluation will take into account both operational modes and utilizing a reservoir for both storage and treatment process. Using master plan future demand to create final models with projected demand information and final storage evaluation.

Colfax Twin Tanks Overflow – Placer County Water Agency (PCWA), Auburn, CA. 2019. Managed design of plans and alternatives analysis to reroute the water storage tanks overflow pipeline to alternative destination.

Design, CM and Operations Plan Development for Antelope and Watt/Elkhorn Reservoir and Booster Pump Station - Sacramento Suburban Water District (SSWD), CA. 2020 – Present. Design of operational retrofit for two reservoir facilities: Antelope Reservoir and BPS and Watt-Elkhorn BPS. Development of Operations Plans to represent how each facility should be operated, identification of potential improvements needed, and creation of Recommended Retrofit TM. Providing draft and final design documents including plans, specifications, and engineer's cost estimate for each facility. Project includes bid assistance and construction management services.

Design and CM for Operational Improvements to the Enterprise/Northrop Reservoir and Booster Pump Station Facility SSWD, Sacramento, CA. 2020 – Present. PBI provided design services to implement recommended improvements from an earlier effort to develop an Operations Plan for the Enterprise-Northrop Reservoir and Booster Pump Station. Improvements include: providing an Operating Scenario Selector switch, Resizing the Sodium Hypochlorite Metering Pumps, Adding new interlocks for the Reservoir Fill Valves, Modifying Booster Pump Station control and interlocks, Incorporating City pipeline flush into the control system, Providing reservoir turnover control during Groundwater Transfer to City scenario, Repairing electrical connections between City Supply MOV and PLC panel. Design documents include draft and final design plans, specifications, and engineer's cost estimate. Project includes bid assistance and construction management.

Enterprise/Northrop Operations Plan - Sacramento Suburban Water District (SSWD). Development of operations plan for tank, pump station, and intertie facility. Pump station can pump from tank or directly from City of Sacramento. Includes intertie between SSWD and City of Sacramento. PBI provided an assessment of how the facility was operated and identified recommended changes. This effort is on-going and will be summarized in Technical Memorandum.

Easton Booster Pump Station & Pressure Reducing Stations – City of Folsom, CA, 2014. Developed plans and specifications for three elements necessary to support the future Aerojet developments of Easton Place, Glenborrow and possibly others. The recommended improvements for the project included: a Booster pump station to supply water from the City's Pressure Zone 1 to the Glenborough Project as well as providing fire flow and two PRV Stations. Project included utility coordination, environmental services and bid support service.

Electric Street Reservoir and Transmission Improvements – Placer County Water Agency (PCWA), Auburn, CA. Provided design and construction management services for a 5MG partially buried reinforced concrete tank and approximately 1.5 miles of transmission mains. Project design needed to be completed within an aggressive 6-month schedule to comply with SRF Funding requirements. Project included SWPPP, Traffic Control Plans, Cal Trans Encroachment Permit, County and City encroachment permits, photo simulations for public outreach, and ROW acquisition.

1 MG Tank Design and Construction – Foresthill PUD, Foresthill, CA. Project manager and construction manager for the design and construction of a 1 MG welded steel storage tank and a 20" bypass pipeline at the Foresthill WTP. PBI provided construction oversight and on-sight inspection services, throughout the construction process.

Bowman and Alta Water Treatment Plants Backwash Storage Tanks Construction – Placer County Water Agency (PCWA), Auburn, CA. Construction Manger. Provided construction management services, specialty inspection services, and engineering services during construction for the construction of two new 100,000-gallon welded steel

tanks at two separate water treatment facilities for PCWA. Work included the recoating efforts for a 1MG welded steel tank and a 100,000-gallon welded steel tank.

Skyridge Pump Station Optimization – Placer County Water Agency, Auburn, CA. Principal. Prepared pump station operational design for hydropneumatic system. Design included design criteria review and pump size selection, operational schema, and recommendations for system improvements.

Gold Village Drought Resiliency Project –Yuba County. Project Manager who provided well investigation and testing of four wells. Developed a feasibility study to assess the ability to provide a new, sustainable source of water to supplement the existing groundwater sources. Designed a new 37' diameter by 35' tall potable water tank with a useable volume of approximately 255,000 gallons. Design included site grading, drainage, electrical, SCADA, pipework and appurtenances, foundation, access road improvement, fencing, paved parking area, and obtaining all required permits.

Arden Intertie and Booster Pump Station Project - California American Water, Sacramento, CA. Provided design services for intertie with Cal Am and City of Sacramento with a booster pump station in Cal Am's Arden system. Included coordination with City of Sacramento Dept. of Utilities for communication and control of flow meter. Project included development of plans, specs, and cost estimate. Included support during construction and start up.

Elverta Tank and Pump Station BODR – California American Water (Cal Am), Sacramento, CA. Project included a 2 MG tank, 5 mgd pump station, and well. Performed siting study, tank sizing calculations, and recommended operations strategy. Developed preliminary design, performed public outreach, submitted use permit application, identified property acquisition requirements, and developed landscape plan and project rendering.

Garden Highway Tank Improvements – City of Yuba City, CA. 2009 - 2010. Project included design of improvements to a 3MG reinforced concrete tank including coated interior, replaced interior and exterior ladders and improvements to interior piping. Provided design and construction management services.

Walerga Tank and Pump Station – California American Water (Cal Am), Sacramento, CA. Provided project management services for the planning, design, and bidding of a 2.5 MG above ground steel water storage tank and 3,500 gpm booster pump station. The project site is land locked and the challenges included procuring access ROW and easements for Cal Am and the other utilities such as SMUD. Responsibilities included: managing design consultants, permitting, technical review, inspection, invoicing, and project and construction management.

Half Moon Bay, Granada, and Alves Tank Improvements - Coastside County Water District, Half Moon Bay, CA. Provided design for the improvement of three tanks ranging in size from 0.2 MG to 2 MG. Included design of annular ring repair, fall protection system, inlet and outlet piping modifications, ladders, vents, and manways.

Finished Water Pumping Station - Stockton East Water District, Stockton, CA. Project manager for predesign and design of improvements to existing 50 mgd finished water pumping station at the water treatment plant. The project increased the pumping capacity to over 70 mgd including modifications to 48- to 54-inch-diameter distribution pipelines supplying water to California Water Service Company and the City of Stockton's service areas. The existing pumping station included 3 diesel-driven pumps that were replaced with electric motors. Improvements also included electrical and control system improvements, along with a backup generator.

Parkside Water Treatment Plant - California American Water, Sacramento, CA. Designed and provided construction management services for removal and replacement of one-ton chlorine cylinder with chlorine generation system.

Countryside Water Treatment Plant - California American Water, Sacramento, CA. Designed and provided construction management services for removal and replacement of one-ton chlorine cylinder with chlorine generation system.

Mather Water Tank, Booster Pump Station, and Water Main - California American Water/Sacramento County, Mather, CA. Project manager for a joint venture project for Cal Am Water and the County of Sacramento to prepare a siting study, and provided design, construction management, and inspection services for a new 3 million-gallon (MG) water tank, 6,000 gpm booster pumping station, and approximately two miles of 8- to 24-inch-diameter water main improvements. The transmission main was designed to transfer flows from the new tank and booster station south of Highway 50 to an area north of Highway 50. The state highway crossing utilized an existing railroad bridge and required installation of licenses and agreements with federal government agencies, Union Pacific Railroad (UPRR), and Sacramento County. Identified project requirements, created, and evaluated proposal solicitations, oversaw consultant activities, developed, and tracked project costs and schedule for budget and schedule management, evaluated project solutions, and acquired permits for the booster pumping station. Construction management services were provided. Additionally PBI provide inspection of the pipeline construction, backfill material, and bedding material, as well as tank foundation, concrete, formwork, rebar, and compaction testing.

Cook Riolo Tank and Pump Station – California American Water (Cal Am), Sacramento, CA. Provided project management services for the planning and design of a 2 MG concrete, partially buried tank and 10 mgd pump station.

Coastside County Water District Tank Rehabilitation Projects – Coastside County Water District, Halfmoon Bay, CA. Provided design and construction management services for improvements to three existing welded steel water storage reservoirs. Improvements included ladders, hand railings, catwalks, and coating

Tank Inspection and Maintenance and Repair Program – City of Folsom, CA. Project manager for the City of Folsom's tank cleaning and repair program. This was a three-year program designed to inspect and repair the City's 13 water storage reservoirs.

Cimarron Tank – City of Folsom, CA. Provided design, construction management services, and specialty inspection services for the rehabilitation of a 3MG welded steel tank. Project included seismic retrofit, new wrapped stairway, and recoating efforts for 3MG welded steel tank.

Reservoir 1 Rehabilitation Design, City of Folsom, CA, 2014-15. Rehabilitation of a 1M gallon water storage tank which included recoating, corrosion protection system replacement, installation of expansion joints on pipes connected to the tank as well as other repairs. PBI provided design services and cost estimation for the tank rehabilitation and engineering support during construction.

La Collina Pump Station and Tank Replacement – City of Folsom, CA. Project manager for the design of the replacement of the water storage tank at the La Collina pump station. Construction manager for the replacement of the tank, and ancillary improvements to the tank. Duty pumps were appropriately sized for projected demand, fire pump capability was assessed, and a hydropneumatic tank was sized to prevent excessive pump cycling.

East Reservoir No 2 Rehabilitation – City of Folsom, CA. Provided design review, construction management services, and specialty inspection services for the rehabilitation of a 3MG welded steel tank. Project included installation of mixing system and recoating efforts for 3MG welded steel tank and installation of new ladder, piping and interior lining.

Foothill Water Treatment Plant Filter Rebuild Project - Placer County Water Agency (PCWA), Auburn, CA. Project manager responsible for the initial design of Actiflo

treatment facility, chemical storage and feed and drying beds. Developed technical specifications to replace filter underdrains. Provided technical design support, bidding support, and construction support services.

Skyridge Pump Station Optimization Study - Placer County Water Agency (PCWA), Auburn, CA. Assessed the current conditions of the pump station. Prepared a technical document identifying alternatives to optimize the hydropneumatic pump station based on system demands, system pressures, and operator input. Identified that existing pumps were incorrectly sized and that existing control strategy reduced system efficiency.

Roseville Road Water Storage Tank, Pumping Station, and Water Main - California American Water (Cal Am), Citrus Heights, CA. Project manager for a siting study, project design, permitting assistance, public outreach, bidding, construction management and inspection services for new 1.7 million-gallon (MG) welded steel water storage reservoir, 3,000 gpm booster pumping station, perimeter wall, and treated water distribution pipeline. Services provided included inspection of foundation, welding, and coating during construction.

High Lift Pumps Station Improvements – City of Yuba City, Yuba City, CA. Project manager for a design to increase the capacity of the High Lift Pump Station. Replaced a 250 hp pump with a 300 hp pump that can supply the load demanded from the station.

Booster Pump Stations - California American Water, Sacramento, CA. Completed preliminary design of two booster stations as second phase of two tank and booster sites. Applied extended period simulation capabilities of H2O Net to size and design the control parameters of each pump in multi-pump facilities.

Alternatives Evaluation for Backwash Water Storage – Placer County Water Agency, Auburn, CA. Principal. Evaluated alternative options for placement of new backwash storage tanks, including one 55,000-gallon and one 45,000-gallon welded steel storage tanks. Included placement of prefabricated sump and pump system, and piping to and from the backwash tanks.

Paseo Tank and Water Main - California American Water, Sacramento, CA. Project manager for siting study, design, and construction management for a new 1.7 million-gallon steel tank and 18-inch-diameter water transmission main that distributes flows from the tank and booster facility.

Dry Creek-West Placer Water Facilities - California American Water, Placer County, CA. Performed a siting study for the treated water storage tank and pumping stations in Placer County. Reviewed all the project plans, established relationships with associated developers and design engineers, and performed system hydraulic modeling to confirm that design standards were met. Assisted with water services agreement that enabled Cal-Am to purchase raw water from Placer County Water Agency that was wheeled through the City of Roseville.

Santa Cruz County Booster Pump Station - California American Water, Santa Cruz County, CA. Completed design and managed construction of a 100 gpm water booster pumping station located in the mountains of Santa Cruz County to alleviate low-pressure complaints due to an inadequate distribution system. Provided construction management services, including attendance at progress meetings; review of submittals, requests for information (RFIs), change orders, and final as-built drawings; documentation management; monthly status reports; and photo documentation. Also provided onsite construction inspection of the foundation, concrete, formwork, rebar, and compaction testing.

Bummerville Treated Water Storage Tank and West Point/Wilseyville Treated Water Storage Tank - Calaveras County Water District (CCWD), San Andreas, CA. As part of the water supply feasibility study, prepared a 30 percent design for 250,000-gallon and one million-gallon treated water storage tanks.

Montara District Schoolhouse Tank Water Storage Tank Site Assessment - California American Water, Montara, CA. Project manager for the review and analysis of water storage requirements and potential tank site locations. Coordinated with San Mateo County to identify permitting requirements for each alternative. The analysis identified that the master plan did not comply with California Department of Health Services (DHS) requirements.

Water Storage Tanks - California American Water (Cal Am), Sacramento, CA. Designed and provided construction management services for three water storage tanks with storage capacities of 1.7, 2.3, and 3 million gallons. Performed hydraulic analysis of closed-circuit pipelines using H20Net and CYBERNET to select tank site locations. Also provided construction inspection of water storage tank foundation, ringwall, coating, concrete, and rebar. Estimated construction costs: $1 million (3 MG tank) and $650,000 (2.3 MG tank).

Groundwater Pump and Treatment Systems at Barstow and Yermo Military Bases - U.S. Navy, CA. Designed and implemented two groundwater pump and treatment systems (1700 and 400 gpm) and three air sparge-vapor extraction systems utilizing granular activated carbon to remove VOCs (PCE and TCE). Also wrote specifications for subcontractors, equipment, and materials; inspected all deliveries of equipment and materials; supervised 30+ man crew and all subcontractors work; prepared detailed isometric piping plans; developed cut sheets for all excavations; performed calculations for sizing pipe and pumps; updated project schedules; managed all procurement items; and conducted weekly meetings. Estimated construction cost: $12 million.

WATER TREATMENT PLANTS

West Point Water System Supply Reliability Project – Calaveras County Water District, San Andreas, CA. Raw water is treated at the West Point Water Treatment Plant (WTP) by a single train Microfloc/Trident clarifier-filter unit that was originally manufactured in 1994 and installed in 2001. The Trident unit is the District's only usable means of providing treatment at this time and is at risk in the event of a mechanical failure. The District is equipping the existing facility with a new parallel treatment system to provide reliability and redundancy. PBI is designing the second treatment unit, including all necessary site work, demolition, modifications to the existing metal building and/or other structures, construction of associated piping, valves, pumps, tanks, chemical systems, SCADA, electrical and instrumentation.

Copper Cove Water System Improvements – CCWD, San Andreas, CA. 2022 – Present PBI is providing design services for a series of high-profile capital improvements to the Copper Cove Water System. Providing tank condition assessments followed by tank rehabilitation design for existing .3MG clearwell and .3MG and .75MG B Zone tanks. Additionally, providing design services to construct a new, second clearwell near the existing clearwell which will be equipped with cathodic protection. Providing design for new .5 MG steel tank to replace existing .3MG redwood tank. The new .5MG steel tank will also be equipped with cathodic protection. Providing assessment of .75 MG steel tank and identifying improvements needed along with associated costs. Design services include mechanical, electrical, and instrumentation components of three existing booster pump stations. Designing new control building to house to house pumps and motor controls. Project also includes design of new 20" transmission main, permitting services, right-of-way, utility coordination, and bid support services.

Coloma WTP Filter Backwash Improvement project – Golden State Water Company, Rancho Cordova, CA. 2021 – Present. PBI is designing improvements to the filter backwash process at the Coloma Water Treatment Plant (WTP) by connecting the filter backwash to system water. Connecting the filters to system water for backwash will allow the existing Coloma WTP effluent pumps to operate more efficiently and to maintain more consistent production and pressure from the Coloma WTP. The services

requested include preparation of design plans, technical specifications, bid assistance, submittal review and engineering support.

Alta Water Treatment Plant Phase II and Phase III, Placer County Water Agency (PCWA), Auburn, CA. 2015 - 2019. Developed plans, specifications, and cost estimate for various site improvements to provide additional capacity at the existing Alta WTP. Phase II design improvements included: Increase raw water pumping capacity to match the filter capacity, improve raw water pump performance at low flows, provide screening upstream of the raw water pumps, replace the influent strainer and filter effluent propeller flowmeter, replace the plant water pump suction piping, and replace the standby generator and automatic transfer switch, Provided construction oversight in both the office and the field, reviewing the submittals and supplying as-built drawing for the construction. Phase III design improvements included: replacing and upsizing pumping equipment by replacing the existing submersible pumps with two new units capable of meeting a firm capacity of 355 gpm to the WTP and replacing the existing pump station strainer with a screen or strainer to prevent moderate to fine debris from entering the pump station.

Jenny Lind Water Treatment Plant Pre-Treatment System - Calaveras County Water District (CCWD), San Andreas, CA. Designed pre-treatment process for the Jenny Lind WTP in response to impacts from the Butte fire. Performed condition assessment and developed predesign studies and reports for the alternatives of pretreatment. Developed the final design for the selected pretreatment process. Currently providing construction support services.

Buckhorn Water Treatment Plant Disinfection Byproduct Improvements Project – Amador Water Agency (AWA), Sutter Creek, CA. Project Manager for engineering design services to provide separation of the inlet and outlet at Tank A to reduce water age in the tank and add ACH feed and storage system for coagulation addition and to improve. Generated alternatives analysis to develop plans for installation of plate settlers in combination with the installation of drying beds. Project included construction management and inspection services.

Ione Water Treatment Plant Backwash Recovery – Amador Water Agency (AWA), Sutter Creek, CA. Project Manager provided review of prior studies and system information, evaluating alternatives for recycling backwash wastewater, and developing plans and specifications for backwash improvements. Project included engineering services during bidding and construction.

Ione Water Treatment Plant Expansion Project – Amador Water Agency (AWA), Sutter Creek, CA. Project Manager responsible for preparing alternatives evaluation for expansion of water treatment plant. Project included developing plans and specifications to expand the packaged water treatment plant capacity from 4mgd to 6mgd. Provided engineering services during bidding and construction

Tanner Backwash Recycling Project – Amador Water Agency (AWA), Sutter Creek, CA. Project Manager responsible for developing plans and specifications for backwash recycling and sludge dewatering improvements. Produced a plan for low-cost sludge dewatering process and revised control strategy to allow concurrent backwash/flush and treatment operations.

Regional Surface Water Supply Project – Turlock Irrigation District. Project Manager for the $240 million pump station, water treatment plant and transmission system. Project included coordination with TID staff, design engineer, six design-build teams and four member cities that will eventually purchase the treated water from TID. Assisted with facility sizing, document review, permitting, design-build proposal development and workshops, bidding services and finance planning.

Program Management Services for Stanislaus Regional Water Authority (SRWA) – Turlock, CA. Provided on-call program management services to SRWA for plans to

construct a Water Treatment Plant (WTP) and transmission pipelines to provide surface water from Turlock Irrigation District (TID) to the two cities of Ceres and Turlock for municipal and industrial uses.

Jenny Lind Water Treatment Plant Expansion – Calaveras County Water District (CCWD), San Andreas, CA. Principal. Provided design and engineering services during construction for the expansion of the existing water treatment plant from 5 mgd to 6 mgd. Design included additional treatment unit, building expansion, pipeline modification, electrical improvements, separation of filter-to-waste from backwash, and solids handling improvements.

Applegate Water Treatment Plant Backwash Water Treatment Pre-Design – Placer County Water Agency, Auburn, CA. Principal. Evaluated alternatives to determine the most effective handling and treatment of washwater residuals from an existing membrane water treatment plant. Prepared design calculations for solids generation and assisted in sizing and preparing life-cycle cost estimate for proper operation in residuals treatment.

Zone 3 WTP Discharge Elimination Project – Placer County Water Agency. Provided project management services for the planning and design of improvements at four different water treatment plants: Alta, Colfax, Monte Vista, and Applegate. Performed alternative analysis for solids removal of membrane backwash water and on-site disposal. Design included two welded steel backwash storage tanks, two cone bottom steel settling tanks, miscellaneous pipeline improvements, and electrical and SCADA improvements. For Alta WTP: New sump, pump, piping, and level controls to intercept 1,440 gpd of instrument water and return to backwash discharge pipe, with appropriate check valve(s). One new 45,000 gal above-ground steel settling tank. For Applegate WTP: New sump, pump, piping, and level controls to intercept 1,440 gpd instrument water and return to backwash discharge pipe, with appropriate check valve(s). Deskins Drying Bed. For Colfax WTP: New 85,000 gal above-ground steel settling tank. RWQCB (NPDES) and DHS (Operating Permit) Permit assistance. For Monte Vista WTP: New sump, pump, piping, and level controls to intercept 1,440 gpd instrument water and return to backwash discharge pipe, with appropriate check valve(s). New 6,000 gal HDPE backwash and filter to waste settling tank.

Operations Plans for four water treatment plants: Jenny Lind WTP, Copper Cove WTP, Hunters WTP, and West Point WTP – Calaveras County Water District (CCWD), San Andreas, CA. Principal in charge of provided engineering services to prepare the water treatment plant operations plans for four of the District's water treatment plants. Plans were prepared in accordance with the Department of Health Services and submitted to the California Department of Public Health. Plans included documentation of treatment plant processes, regulatory reporting requirements, and optimization of plant operation.

Bowman Water Treatment Plant Residuals Handling Improvements, Pre-Design – Placer County Water Agency, Auburn, CA. Principal. Evaluated alternatives to determine the most effective handling and treatment of washwater residuals from an existing conventional water treatment plant. Prepared design calculations for solids generation and assisted in sizing Deskins® sand drying beds for proper operation in residuals treatment. Prepared preliminary site selection for equalization basin, drying beds, and ancillary facilities.

Larkfield Water Treatment Plant Expansion – California American Water, Larkfield, CA. 2008-2009. Provided permit assistance, design, and construction management for the installation of a third filter and modifications to the existing filter controls to integrate the third filter. Intent of this project was to increase the WTP capacity to 1,800 gpm. Provided pilot testing services to investigate the potential application of ferric chloride co-precipitation and greensand pressure filtration process with respect to arsenic removal at the existing Larkfield Water Treatment Plant. Provided design and construction services for a new arsenic treatment system utilizing coagulation/filtration. Added Owner

supplied third filter to existing arsenic treatment system. Project included construction management services.

Greenwood Reservoir Water Treatment Plant – Georgetown Divide PUD. Provided project review, design, and construction management for the construction of the Greenwood Reservoir WTP. Managed pre-construction, field reports and construction oversight, as well as as-built designs for the project.

Auburn 8 mgd Water Treatment Plant – Placer County Water Agency, Auburn, CA. 2007. Design and construction management services for a $27 million modular treatment facility. Plant designed for expansion to 14.0 mgd, including in-ground clearwell RD storage, high service pumping, and extensive SCADA system linked to wide area network for monitoring and control of all District facilities from this central location. Plus separate maintenance facilities and computer services building for serving District wide administrative needs.

Feasibility Study for Water Treatment Facility – Port of Stockton. Researched the concept of building a water treatment plan for the Port of Stockton region. Studied water demand, storage, and distribution data for the region. Estimated the requirements and costs associated with the facility and presented information helping to dictate the feasibility of the plant.

Auburn Lake Trails WTP Upgrade Feasibility Study – Georgetown Divide Public Utility District. Project Manager for the evaluation of alternatives to improve the existing filtration process from in-line filtration to a DPH approved technology including direct filtration, pressure clarification/filtration, contact clarification-filtration, and membrane filtration. Identified operational and regulatory improvements, in conjunction with GDPUD staff, which will improve the long-term operation and compliance of the facility.

Alternative Disinfection Processes Feasibility Study – El Dorado Irrigation District. Project manager for the study of different possible disinfection processes. Several different processes were investigated, each with different strengths, weaknesses, and cost associated to them. The group looked into which process or series of processes could most effectively meet the demand of the client at the lowest cost.

Felton Surface Water Treatment Facility - Town of Felton, CA. Siting study and resident engineering for a new $4 million 1 mgd surface water treatment facility. Project included fish passage stream improvements, raw water intake and pump station, raw water and treated water pipelines, site work, 3,040-square-foot building, water treatment facilities, 500,000-gallon welded steel backwash tank, and two reclaimed water basins. Facilities are located on extremely hilly terrain.

Montara Water Treatment Plant - California American Water, Montara, CA. Planning and siting study for the new 0.5 mgd Montara Water Treatment Plant, 1 MG treated water storage tank, and treated water distribution piping. Facilities are located on extremely hilly terrain and in a coastal region.

PROFESSIONAL AFFILIATIONS

Mountain Counties Water Resources Association (MCWRA)
Association of California Water Agencies (ACWA)
American Society of Civil Engineers (ASCE)
Sacramento Area Water Works Association (SAWWA)
American Water Works Association (AWWA)

Ashley Smith, P.E.

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

Education
B.S. Civil and Environmental Engineering with Minor in Sustainability in the Built Environment, UC Davis, 2013

Registrations
Registered Professional Civil Engineer
California No. 86512

Water Treatment Operator, Grade T2 No. 42384

Specialized Training
AutoCAD Civil 3D
ArcGIS
InfoWater
HEC-RAS
HEC-SSP
FLO-2D

EXPERIENCE

Ashley has over eight years of experience in water and water resources projects. She has design experience in pump stations, water storage tanks, and pipelines using AutoCAD Civil 3D. She also has planning experience in flood management, water system master plan, capital improvement plans, and cost estimating. She has been the responsible engineer for numerous water infrastructure projects since she joined PBI in 2014 and has accrued valuable experience in water infrastructure and pipeline design, as well as hydraulic modeling. Project experience includes:

WATER PLANNING AND MODELING

Recycled Water Master Plan Update and Hydraulic Model, City of Folsom, CA. 2020 – Present. The City has recently expanded its service area to allow for future development projects in the areas south of Highway 50. The City is preparing for significant growth, particularly in the areas south of Highway 50. The major planned developments south of Highway 50 include the Easton Project and the Folsom Plan Area (FPA). PBI is updating the 2015 Folsom Plan Area (FPA) Non-Potable Water Analysis 2.0 (2015 Analysis) in conjunction with developing a hydraulic model for the non-potable water distribution system. The Plan will include evaluation and sizing for existing infrastructure and planned backbone infrastructure.

On-Call Modeling Support Services - City of Folsom 2016 to Present. Water System Importing for Folsom Plan Area Developments into model and modeling of fire flow tests.

Folsom Plan Area (FPA) Hydraulic Model Update - City of Folsom 2018 to Present. Integrating planned FPA and existing developments into the City's hydraulic model and redistributed demand data to new development by land type. The model runs tests to confirm acceptable importation of new infrastructure. An intermediate model was developed to simulate temporary operation conditions prior to the Zone 4 tank being constructed.

2016 Water Master Plan Update and 2015 Urban Water Management Plan, City of Folsom, CA. Project engineer who provided data review and analysis, development of demand projections, analysis of demand management measures, population and demographic analysis, system supplies, water supply reliability, water shortage contingency planning, climate change, and other factors. Updated hydraulic models for existing, intermediate, and build out scenarios. Evaluated the water system relative to current and future water demands consistent with 2015 Urban Water Management Plan and identified system improvements. Developed 10-year Capital Improvement Program including cost estimates. Prepared draft and final reports.

Jenny Lind Water System & Copper Cove Water System Master Plans. Project engineer to develop water master plans for the Jenny Lind and Copper Cove Water Systems. Developed existing and build-out conditions water system models utilizing Innovyze InfoWater to assess the systems in comparison to District design standards. Performed evaluation of existing distribution system to identify pipeline improvements.

Transmission Main Evaluation – Fair Oaks Water District, CA. Study to assess the current condition of FOWD's transmission mains. Developed a risk-based assessment tool for customized pipe risk screening based on available data including age, material, leak history, and consequences of failure to assess the current condition of FOWD's transmission mains. Used CCTV inspections for the internal surveying of one mile of pipeline Included development of alternatives for rehabilitation, abandonment, and replacement of the system. The evaluation concluded with a phasing plan for the Program, identifying the schedule for

replacement or rehabilitation and a capital improvement plan for implementing the alternatives.

2020 and 2015 Urban Water Management Plan – Fair Oaks Water District, Fair Oaks, CA. PBI recently completed the 2020 UWMP update for the assessment of all water utilities in Fair Oaks. Previously PBI had prepared, in its entirety, the 2015 UWMP per California Water Code. Provided analysis for the current system and its efficiency and designed a master plan that could be capable to satisfy the demand from the system. Evaluated all aspect of the UWMP sections including water supply and demand for existing and future build-out scenarios, water shortage contingency planning, system supplies, and other factors. Designed a plan for the construction and maintenance needed to be done to get the system to this level of operation.

2017 Water System Model Update – Fair Oaks Water District, Fair Oaks, CA. Project Engineer for the update to the existing hydraulic model. Updated model characteristics with new facilities and verified model results with field fire flow tests. Provided draft and final reports of findings.

On-Call Extension of Staff Services – Fair Oaks Water District, Fair Oaks, CA. Project Engineer for ongoing support for on-call extension of staff to support hydraulic model inquiries. This includes staff training on use of the District's recently updated water system model.

Ebbetts Pass Water System Master Plan and Capacity Charges - Calaveras County Water District, San Andreas, CA. Evaluated and updated water master plan and provided capacity charge updates. Project included evaluation of historical water demands and growth rates. Developed capital improvement projects including storage tanks, treatment facilities, booster pump stations, and distribution system piping. Evaluated existing capacity charges and made recommendations for new updated charges. Estimated costs for build-out conditions.

Jenny Lind Water System Master Plan and Capacity Charges - Calaveras County Water District, San Andreas, CA. Utilized the water district's provided growth and water demand projections to determine cost of improvements associated with growth. Developed capital improvement projects including storage tanks, treatment facilities, booster pump stations, and distribution system piping. Evaluated existing capacity charges and made recommendations for new updated charges. Estimated costs for build-out conditions

Copper Cove Water System Master Plan and Capacity Charges – Calaveras County Water District, San Andreas, CA. Updated water master plan and provided capacity charge updates. Evaluated historical water demands and growth rates for two different regions of the CCWD system. Developed capital improvement projects including storage tanks, treatment facilities, booster pump stations, and distribution system piping. Evaluated existing capacity charges and made recommendations for new updated charges. Estimated costs for build-out conditions.

WATER DISTRIBUTION AND PIPELINES

Fruitridge Vista Water System – 2021 Backyard Drop-In Meters – California American Water, Sacramento, CA. PBI provided the design of approximately 330 backyard and front yard drop-in water meters and new service laterals. The project includes: the development of design plans and specifications, permitting, and bid and construction support services.

Oak Avenue Parallel Pipeline Project – City of Folsom, CA. Providing design services to eliminate the need for emergency storage at the Oak Avenue pump station and would like to divert flow through a parallel pipeline. Project design includes the development of plans and specifications for the construction of the Oak Avenue

Parallel Pipeline. Project includes coordination of survey, right of way, and environmental services. Project will also include bid support and construction support services.

Dutch Flat Mutual Consolidation Project - Placer County Water Agency, Auburn, CA. The objective of the project was to connect PCWA's Alta water system to the Dutch Flat Mutual water system, bring the Dutch Flat Mutual water system up to current design standards and ultimately dissolve the mutual water system with the consolidation of the two systems. Developed preliminary design report assessing alternatives for the consolidation of Dutch Flat Mutual. Design included plan and profile sheets for approximately 2-miles of water distribution pipelines ranging in size from 10" to 8" to replace the existing undersized and failing distribution system: intertie the two systems, install tank control valve, SCADA, pressure reducing station, and replacement of approximately 10,000lf of water mains. Utilized potholing and USA markings from geotechnical effort to identify locations of existing utilities. Design included replacement of water services and in many cases required modified connections to the existing customers. Included permitting coordination with the Department of Drinking Water and Placer County. Ashley is PBI's project manager currently providing bid support services.

Transmission Main Evaluation – City of Roseville, CA. Project Engineer responsible for the development of a full desktop evaluation utilizing a risk-based approach for all of the transmission mains within the City of Roseville. Developed a pipe risk screening tool utilized for the evaluation. Conducted collaborative workshops with City Staff to develop the desktop evaluation.

Highway 20 Realignment Pipeline - Browns Valley Irrigation District. Project engineer for the design of approximately one mile of raw water pipeline to be relocated by Caltrans during the realignment of the Highway 20 near Smartsville, CA. Project included three Highway 20 crossings. The new HDPE pipeline was designed to replace those impacted by the Highway 20 realignment. Project included the development of traffic control plans, assistance with bidding, and providing engineering support during construction. Prepared As-built drawings.

Sicard Pipeline Project – Browns Valley Irrigation District (BVID), Browns Valley, CA. The objective of the project was to pipe approximately 10 miles of an open ditch system (Sicard Flat Ditch) to eliminate water loss from the ditch and improve service to customers. PBI developed a planning study to determine build out pipeline sizing and to identify preferred alignments. The project was broken up into 6 phases and included a detailed construction sequencing plan as the construction had to occur during limited windows between October and April to avoid impacting the seasonal irrigation demands. The design included plan and profile design sheets and specifications for the construction of approximately 9.6 miles of new 48" to 24" pipeline. The alignment included cross country, dirt roads, county roads and the existing ditch.

Relocation of Water Lines for the I-80 Auxiliary Lanes Project – City of Roseville, CA. The I-80 Auxiliary Lanes Project has three storm drain crossings that conflict with the City's distribution water mains that will require relocation. PBI is developed the relocation plans for three conflicting water lines so they could be incorporated into the Caltrans contract documents for I-80 auxiliary lanes project.

Foresthill Road Pipeline Replacement - Foresthill Public Utilities District, Foresthill, CA. Project included the design of approximately one mile of 12" diameter water main in Foresthill Road to replace an old failing main. Included installation of new meters and service lines for approximately 35 homes. Design included existing utility location research and inclusion into the design along proposed pipe alignment. Design included applicable detail sheets, including pipeline appurtenances, trenching, and detailed tie-in plans. Included permitting coordination

with the Department of Drinking Water and Placer County. Project included bid support and construction management services.

Keena-Bell Pipeline Replacement - Placer County Water Agency, Auburn, CA. Project objective was to replace and relocate a failing cross country water main and place within County and private roads. Ashley was the lead design engineer who provided design services for the installation of 2,400 ft of new 18" transmission line to replace an aging 14" pipeline. Project was mostly through private property and required reconnection of existing water services. Project included permitting coordination with the Department of Drinking Water and Placer County and public outreach to coordinate proposed improvements with property owners. Assisted PCWA with development of permanent and temporary construction easements.

Ophir Road Pipeline Project - Placer County Water Agency, Auburn, CA. PBI design lead who provided design services for the installation of 2,500 ft of new 12" transmission line. Completed design in less than three months, with aggressive compressed schedule, to allow new water service to a community with a failing well. Design included traffic control plans, Placer County encroachment permit, and coordination with Placer County. Project was funded by State and Federal drought related grants.

Golden State Intertie and Pipeline - City of Folsom. Project engineer for the feasibility study, design, and installation of 1,800 feet of pipe to connect Intertie pump station with the City of Folsom system. Required the coordination of Folsom, Easton, and intertie pump stations designed to tie the utilities of each together into the City of Folsom water system. Managed the whole process, including feasibility studies, designs, and as build designs.

Larkfield Pipelines Project - California American Water. Provided design and engineering support during construction for the Larkfield Pipelines Project. Services included: identify potential utility conflicts that may be located within the vicinity of the project, development of plans and specifications adequate for the construction of the Larkfield Pipelines, obtaining permits as identified, participate in the bidding process including: pre-bid walk through, response to question, and preparation of addendum. Provided engineering support during construction.

Crestridge Lane Pipeline Replacement - City of Folsom, Folsom, CA. Developed plans and specifications of a new water pipeline that will replace a privately owned pipeline serving approximately 40 homes in a community built on a single parcel. Project included the design of approximately 2,000 lf of 8" water main in Crestridge Lane and the installation of new meters and service lines. Design required installation of individual water meters at each home which were originally served through one meter at the bottom of the parcel. The design also included the installation of a new sewer line to service the community. Provided construction management services for the installation of the pipelines and water meters.

Isleton Distribution System Improvements - California American Water. Established methods required to abandon in-place water pipes in levee. Designed plans and specifications for the construction of new pipelines and water service connections through levee. Coordinated and supported permitting efforts with descriptions and figures to obtain all necessary permits. Provided engineering support during bidding and construction.

Ebbetts Pass Reach 3A Pipeline Technical Review and Hydraulic Modeling Project - Calaveras County Water District. Assisted the District with development of the project design including: project deliverables, plans, specifications, and cost estimate. Updated and utilized the Innovyze InfoWater hydraulic model of water system to develop the construction sequencing plan. Provided evaluation of several

miles of Ebbetts Pass transmission mains to prioritize improvements by reach – each reach varied in length from one to five miles.

Trussel Plant Offsite Improvements Project - Golden State Water Company. Project engineer for the planning and design to provide piping for drainage of surface runoff and well water discharge, provide water main connection to existing main in a residential street, design construction of street improvements, and conduct permitting and right-of-way support.

WATER TREATMENT

Copper Cove Water System Improvements – CCWD, San Andreas, CA. 2022 – Present. PBI is providing design services for a series of high-profile capital improvements to the Copper Cove Water System. Providing tank condition assessments followed by tank rehabilitation design for existing .3MG clearwell and .3MG and .75MG B Zone tanks. Additionally, providing design services to construct a new, second clearwell near the existing clearwell which will be equipped with cathodic protection. Providing design for new .5 MG steel tank to replace existing .3MG redwood tank. The new .5MG steel tank will also be equipped with cathodic protection. Providing assessment of .75 MG steel tank and identifying improvements needed along with associated costs. Design services include mechanical, electrical, and instrumentation components of three existing booster pump stations. Designing new control building to house to house pumps and motor controls. Project also includes design of new 20" transmission main, permitting services, right-of-way, utility coordination, and bid support services.

Coloma WTP Filter Backwash Improvement project – Golden State Water Company, Rancho Cordova, CA. 2021 – Present. Project Manager for the design of improvements to the filter backwash process at the Coloma Water Treatment Plant (WTP) by connecting the filter backwash to system water. Connecting the filters to system water for backwash will allow the existing Coloma WTP effluent pumps to operate more efficiently and to maintain more consistent production and pressure from the Coloma WTP. The services requested include preparation of design plans, technical specifications, bid assistance, submittal review and engineering support.

Alta Water Treatment Plant Phase II and Phase III - Placer County Water Agency, Alta, CA. Project engineer for the design, review, and cost estimate of the second and third phases of improvements at the Alta WTP to increase capacity. Phase II design improvements included: Increase raw water pumping capacity to match the filter capacity, improve raw water pump performance at low flows, provide screening upstream of the raw water pumps, replace the influent strainer and filter effluent propeller flowmeter, replace the plant water pump suction piping, and replace the standby generator and automatic transfer switch, Provided construction oversight in both the office and the field, reviewing the submittals and supplying as-built drawing for the construction. Phase III design improvements included: replacing and upsizing pumping equipment by replacing the existing submersible pumps with two new units capable of meeting a firm capacity of 355 gpm to the WTP and replacing the existing pump station strainer with a screen or strainer to prevent moderate to fine debris from entering the pump station.

Ione Water Treatment Plant Expansion Project - Amador Water Agency. PBI reviewed prior studies and system information. Prepared alternatives evaluation for expansion of WTP to provide additional treatment capacity and to provide a redundant filter per a request from CA Department of Public Health (CDPH). Due to site constraints of the Ione WTP, expanding the existing clarifiers is not feasible. Therefore, new high rate clarifiers were designed to maintain the WTP's classification as a "conventional" water treatment facility (flocculation, clarification,

and filtration). PBI developed plans and specifications for expanding packaged WTP capacity from 4 mgd to 6 mgd.

Buckhorn Water Treatment Plant Disinfection Byproduct Improvements Project - Amador Water Agency. Project Engineer for the preparation of preliminary design criteria. Engineering design services to provide separation of the inlet and outlet at Tank A to reduce water age in the tank. Engineering design services to add ACH feed and storage system for coagulant addition and improve TOC removal. Provided alternative analysis to develop plans for installation of plate settlers in combination with the installation of drying beds.

Tanner Backwash Recycling Project – Amador Water Agency (AWA), Sutter Creek, CA. Amador Water Agency desired to eliminate backwash waste discharge from its Tanner Water Treatment Plant (WTP) by clarifying and recycling wastewater from the plant backwash process. The goal of the project was to implement a backwash recovery scheme to separate the recyclable water from the concentrated sludge stream and remove entrained solids so that wastewater does not leave the site. PBI was responsible for developing plans and specifications for backwash recycling and sludge dewatering improvements. Produced a plan for low-cost sludge dewatering process and revised control strategy to allow concurrent backwash/flush and treatment operations.

WATER STORAGE AND PUMPING

Water Supply Project – Northern California Tribe. The first task for this project was the preliminary and 30% design of a floating intake and approximately 1.2 miles of water transmission main. The preliminary design report confirmed design criteria and identified recommended improvements. The 30% design was completed and a construction cost estimate was provided to the Tribe for the proposed improvements. Project includes the design of a 30,000 gallon/day water treatment plant, two water storage reservoirs (approximately 500,000 gallons each), one break tank, and one clearwell. The sizing of these facilities will be based on updated water demands and allow for the preparation of a preliminary design report to determine the design criteria for this project. Additionally, PBI will investigate the viability of pumping groundwater to the Tribal property in order to meet its immediate needs for drinking and fire suppression water until the planned Water Supply Project becomes on-line. An assessment will be made of the viability of utilizing the Tribe's existing wells and if necessary, design, permit, and locate additional wells including recommending the location for drilling additional wells and integrating the new wells into the existing water distribution system. An assessment will also be made of the general condition, water quality, and capacity of existing wells. Project includes permitting support for new and/or refurbished wells.

Reservoir 1 Storage Analysis – El Dorado Irrigation District (EID), Placerville, CA. 2021 – Present. Project Manager responsible for performing a storage evaluation of the District's service area utilizing the District's InfoWater models for all modeling efforts. Project includes evaluating current storage status and reviewing current system and operational status, and identifying limiting characteristics in the current system including reservoir sizing and water quality analysis. The evaluation will take into account both operational modes and utilizing a reservoir for both storage and treatment process. Using master plan future demand to create final models with projected demand information and final storage evaluation.

Colfax Twin Tanks Overflow – Placer County Water Agency, Auburn, CA. PBI managed the design of plans and alternatives analysis to reroute the water storage tanks overflow pipeline to alternative destination.

Easton Booster Pump Station & Pressure Reducing Stations – City of Folsom, CA, 2014. Developed plans and specifications for three elements necessary to support the future Aerojet developments of Easton Place, Glenborrow and possibly others. The recommended improvements for the project included: a Booster pump station to supply water from the City's Pressure Zone 1 to the Glenborough Project as well as providing fire flow and two PRV Stations. Project included utility coordination, environmental services and bid support service.

Arden Intertie and Booster Pump Station Project – California American Water (Cal Am), Sacramento, CA. 2017 - 2019. In order to supplement diminishing water supply in California American Water's (Cal-Am) Arden System during peak demands, an inter-tie with the Sacramento Suburban Water District's (SSWD) adjacent distribution network has been deemed necessary. PBI provided design to construct a distribution booster pump station to connect to the existing inter-tie which has been constructed. The booster pump station will provide supply reliability and adequate pressure under peak demand conditions. Project included a concrete masonry building, three booster pumps, piping and electrical work to connect new booster pumps to existing distribution system.

Gold Village Drought Resiliency Project –Yuba County. PBI provided well investigation and testing of four wells. Developed a feasibility study to assess the ability to provide a new, sustainable source of water to supplement the existing groundwater sources. Designed a new 37' diameter by 35' tall potable water tank with a useable volume of approximately 255,000 gallons. Design included site grading, drainage, electrical, SCADA, pipework and appurtenances, foundation, access road improvement, fencing, paved parking area, and obtaining all required permits.

1 MG Tank Design and Construction - Foresthill PUD. Performed a siting study and design for a 1MG potable welded steel water storage tank and foundation at the Foresthill Water Treatment Plant in the foothills of Placer County. Evaluated potential sites for the location of the new tank. Project included geotechnical investigation including permitting, field exploration, laboratory testing, and geotechnical design report preparation, site grading, preliminary layout and construction cost estimate. Provided construction management and inspection services.

East Reservoir No 2 Rehabilitation – City of Folsom, Folsom, CA. Provided design review, construction management services, and specialty inspection services for the rehabilitation of a 3MG welded steel tank. Project included installation if mixing system and recoating efforts for 3MG welded steel tank and installation of new ladder, piping and interior lining.

La Collina Pump Station and Tank Replacement - City of Folsom, Folsom, CA. Project Engineer for the design of the replacement of the water storage tank at the La Collina pump station. Duty pumps were appropriately sized for projected demand, fire pump capability was assessed, and a hydropneumatic tank was sized to prevent excessive pump cycling.

PROFESSIONAL AFFILIATIONS AND ACCOMPLISHMENTS

Member, Sacramento Valley, Engineers Without Borders
Member, American Society of Civil Engineers
Member, Society of Women Engineers
2019 Humanitarian Award, ASCE Sacramento Section

Patrick C. Sweeney – Curricular Vitae

Short-Form Water

Education

Bachelor of Science Degree, Industrial Technology
California State University at Los Angeles

Certifications

SSPC – Certified Protective Coatings Specialist
Certificate #887-792-1267

NACE International – Certified Coatings Inspector Level 3 #4324

Instructor for SSPC's PCI Program

SSPC – Certified Master Coating Inspector (MCI) #10031

SSPC – Certified Protective Coating Inspector (PCI) Level III

SSPC – Certified Concrete Coating Inspector (CCI)

Instructor for SSPC's PCI Program

Instructor for SSPC's C-1 "Fundamentals of Coating on Industrial Structures."

Instructor for SSPC's C-2 "Specifying and Managing Protective Coatings Projects."

SSPC-C3 Certified Supervisor for Deleading of Ind. Structures

SSPC-C7 Fundamentals of Dry Abrasive Blast Cleaning

Federal Highway Admin./FHI - Certified Instructor "Bridge Coatings Inspection" (13709).

Certified Linabond Copolymer Inspector

Certified Ameron T-Lock/Arrowlock Inspector

Professional Affiliations

AWWA (Past Chair Corrosion and Tank… Maintenance Committees)

SSPC (SoCal /So Nev Chapter Chair)

NACE International (Channel Islands Section Trustee)

Mr. Sweeney has worked for over 30 years as a coating inspector, coating expert/specialist, & project manager supporting the quality of coating or lining projects in water, wastewater, and other environments. He also manages CSI Services, a SSPC QP5 certified inspection firm. He has successfully completed over 3000 projects and routinely completes maintenance and corrosion surveys (both dry & underwater) and develops specifications. He has prepared over 600 industrial coating specifications. A partial list of projects:

Golden Gate Bridge North Viaduct Retrofit Project - Project Manager for both shop and field coating inspection for the $350,000,000 Seismic Retrofit and Repainting of the Bridge.

City of Pleasanton, CA - Project Manager during the maintenance of over 3 water storage tanks. Assignments included evaluations, engineering and design, and inspection services.

El Dorado Irrigation District, CA - Project Manager during the maintenance of over 8 water storage tanks. Assignments included evaluations, engineering and design, and inspection services.

City of West Sacramento, CA - Project Manager during the maintenance of over 2 water storage tanks. Assignments included evaluations, engineering and design, and inspection services.

Santa Clarita Valley Water Agency, Santa Clarita, CA - Project Manager during the maintenance of over 100 water storage tanks. Assignments included evaluations, engineering and design, inspection services, and the development of a Master Tank Maintenance Plan.

Elk Grove Water District, CA - Project Manager during the maintenance of over 6 water storage tanks. These assignments included evaluations, engineering and design, and inspection services.

City of Hayward, CA - Project Manager during the maintenance of over 7 water storage tanks, and numerous wastewater structures. Assignments included evaluations, engineering and design, and inspection services.

U.S. Department of Defense - Project Manager during the coating & corrosion evaluation of over 300 steel, concrete, and plastic storage tanks located within 75 different military bases. He acted as Protective Coating Specialist on over 50 projects throughout US and Pacific Rim.

Amador Water Agency, CA - Project Manager during the maintenance of over 7 water storage tanks and numerous new water tanks. Assignments included evaluations, engineering, and inspection.

SSPC, NACE, and FHWA Certification Programs
Instructed over 1750 professionals/inspectors through these accredited weeklong coating courses that focus on the use of industrial coatings.

A more comprehensive CV of accomplishments and qualifications is available.

Estimated Work Effort and Cost
Calaveras Public Utility District - 2023 Water Master Plan Project

Task No.	Task Description	Principal in Charge Karl Brustad	Project Manager 2 Ashley Smith	Senior Engineer 2 Tim Hasler	Staff Engineer 2	Administrative 4 Ann D'Ambrosio	PBI Labor	Total PBI Labor ($)	CSI (Tank Inspection)	PBI Expenses ($)	Total Cost ($)
	2023	$ 265.00	$ 225.00	$ 225.00	$ 155.00	$ 110.00					
Task 1 -	**Project Management**										
1.1	General Project Management	8	24			6	38	$8,180		$818	$8,998
1.2	Project Meetings	12	12		6		30	$6,810		$681	$7,491
1.3	Quality Assurance/Quality Control	8		8			16	$3,920		$392	$4,312
1.4	Monthly Invoices & Progress Reports		6			6	12	$2,010		$201	$2,211
	Subtotal Task 1	**28**	**42**	**8**	**6**	**12**	**96**	**$20,920**	**$0**	**$2,092**	**$23,012**
Task 2 -	**Review Prior WMP and Available Information**										
2.1	Review Most Recent WMP		4		8		12	$2,140		$214	$2,354
2.2	Review and Collect Available Information	2	8		24		34	$6,050		$605	$6,655
2.3	Describe Study Area and Existing Water System	2	4		16		22	$3,910		$391	$4,301
2.4	Review Current and Projected Water Demands	2	8	2	16		28	$5,260		$526	$5,786
	Subtotal Task 2	**6**	**24**	**2**	**64**	**0**	**96**	**$17,360**	**$0**	**$1,736**	**$19,096**
Task 3 -	**Software Update and Model Development**										
3.1	Update Software Model	2	4		4		10	$2,050		$205	$2,255
3.2	Develop Model	4	8		32		44	$7,820		$782	$8,602
3.3	Calibrate Model	4	16	4	40		64	$11,760		$1,176	$12,936
3.4	Model Development Report	4	12	8	24		48	$9,280		$928	$10,208
	Subtotal Task 3	**14**	**40**	**12**	**100**	**0**	**166**	**$30,910**	**$0**	**$3,091**	**$34,001**
Task 4 -	**Water System Analysis**										
4.1	Develop System Evaluation Criteria	4	12		40		56	$9,960		$996	$10,956
4.2	Analyze Water System and Recommend Improvements	12	24	8	80		124	$22,780		$2,278	$25,058
4.3	Perform Condition Assessment	4	16	4	40		64	$11,760	$4,840	$1,176	$17,776
	Subtotal Task 4	**20**	**52**	**12**	**160**	**0**	**244**	**$44,500**	**$4,840**	**$4,450**	**$53,790**
Task 5 -	**Prepare 5-Year CIP & 20-Year Asset Management Plan**										
5.1	Prepare 5-Year Capital Improvement Plan and 20-Year Asset Management Plan	2	8	0	40		50	$8,530		$853	$9,383
	Subtotal Task 5	**2**	**8**	**0**	**40**	**0**	**50**	**$8,530**	**$0**	**$853**	**$9,383**
Task 6 -	**Prepare Updated Water Master Plan**										
6.1	Administrative Draft Water Master Plan	4	16	8	40		68	$12,660		$1,266	$13,926
6.2	Prepare Final Water Master Plan	2	8	4	20		34	$6,330		$633	$6,963
	Subtotal Task 6	**6**	**24**	**12**	**60**	**0**	**102**	**$18,990**	**$0**	**$1,899**	**$20,889**
	COLUMN TOTALS	**76**	**190**	**46**	**430**	**12**	**754**	**$141,210**	**$4,840**	**$14,121**	**$160,171**

TOTAL COST	$160,171

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

Calaveras Public Utility District
Income and Expenses by Category w/ Debt Service Ratio
1st/2nd Quarter Fiscal Year Ending June 30, 2023

	Division	Actual 1st/2nd QTR FY 22-23	Budgeted FY 2022-23	
Income		$ 1,357,411	$ 2,736,045	50%
Rate Stabilization		$ 22,500	$ 338,636	7%
Total Income		$ 1,379,911	$ 3,074,681	45%
Expense Categories				
	Division			
Salaries	100	$ 405,627	$ 952,000	43%
Benefits	200	$ 495,909	$ 839,547	59%
Conferences, Meetings and Training	300	$ 6,342	$ 35,952	18%
Administration Expenses	400	$ 133,282	$ 297,114	45%
Operations Expense	500	$ 145,765	$ 313,311	47%
Outside Services	600	$ 79,015	$ 206,051	38%
Equipment Rent, Taxes, and Utilities	700	$ 34,077	$ 250,817	14%
Total Expenses		$ 1,300,017	$ 2,894,792	45%
Net Operating Income		$ 79,894	$ 179,889	
Capital Projects	800	$ 1,340,940	$ 2,913,729	46%
Debt Payments	900	$ 66,482	$ 132,964	50%
Total Capital + Debt		$ 1,407,422	$ 3,046,693	46%

Debt Ratio (NI/DP)		
Net Operating Income (NI)	$ 79,894	$ 179,889
Debt Payments (DP)	$ 66,482	$ 132,964
Debt Ratio	1.20	1.35

Calaveras Public Utility District
Salaries and Benefit Expenditure Account Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

				Actual	Budget	
Salaries	Division		100	$ 405,627	$ 952,000	43%
Benefits	Division		200	$ 495,909	$ 839,547	59%
		Total		$ 901,536	$ 1,791,547	50%

Division	GL	Description	Actual Expense (July-Dec)	Budget FY22-23	
100	5100	Executive Salary	$ 56,544	$ 135,000	42%
100	5110	Administration Salaries	$ 87,325	$ 223,000	39%
100	5120	Operations Salaries	$ 222,449	$ 545,000	41%
100	5130	Overtime Compensation	$ 32,234	$ 24,182	133%
100	5140	On Call Pay	$ 7,074	$ 24,818	29%
100	5150	Holiday Pay	$ 19,378	$ 5,292	366%
100	5160	Vacation Pay	$ 12,294	$ 35,277	35%
100	5170	Sick Pay	$ 8,677	$ 42,332	20%
200	5200	Medical Benefits	$ 187,207	$ 282,856	66%
200	5205	Executive Car Allowance	$ 1,800	$ 3,600	50%
200	5210	Medical Benefits - Retiree (Pay as you Go)	$ 31,591	$ 108,000	29%
200	5220	Dental/Vision/ Life Insurance	$ 9,898	$ 29,150	34%
200	5230	Retirement Benefits - Calpers	$ 236,250	$ 202,236	117%
200	5240	Other Post Employment Benefits (OPEB)	$ -		
200	5250	Medical Tax, Social Security and SUI	$ 20,563	$ 143,254	14%
200	5260	Worker's Compensation Insurance	$ 7,127	$ 68,750	10%
200	5270	Education Assistance	$ -	$ -	
200	5280	Employee Overtime Meals	$ 216	$ 1,200	18%
200	5290	Employee Recognition	$ 1,256	$ 500	251%
		Salaries	$ 445,976	$ 1,034,900	43%
		Salaries (Reduced Sick, Holiday and Vacation)	$ 405,627	$ 952,000	43%
		Benefits	$ 495,909	$ 839,547	59%

Calaveras Public Utility District
Conferences, Meetings, and Training
Expenditure Accounts Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

			Actual	Budget
Conferences, Meetings and Training	Division	300	$ 6,342	$ 35,952

Division	GL	Description	Actual Expense (July-Dec)	Budget FY22-23
300	5310	Board Meetings - Director Fees	$ 2,800	$ 8,925
300	5315	Seminars & Conferences - Board	$ -	$ 5,250
300	5320	Seminars & Conferences - Staff	$ 1,375	$ 8,400
300	5325	Mileage Reimbursement, Parking, Tolls	$ -	$ 1,470
300	5330	Auto Rental	$ -	$ 2,100
300	5335	Training	$ 2,167	$ 9,807

Calaveras Public Utility District
Administration Expense Accounts Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

			Actual	Budget
Administration Expenses	Division	400	$ 133,282	$ 297,114

Division	GL	Description	Actual Expense (July-Dec)	Budget FY22-23
400	5415	Advertising	$ 861	$ 4,000
400	5420	Association Dues	$ 22,260	$ 64,777
400	5425	Insurance	$ 56,547	$ 20,269
400	5430	License, Certifications, Fees	$ 420	$ 12,968
400	5436	Repairs & Maintenance -Computers	$ -	$ 5,000
400	5437	Repairs & Maintenance -Office	$ 1,831	$ 7,500
400	5440	Election Costs	$ -	$ -
400	5460	Permits	$ 794	$ 68,355
400	5461	Regulatory Fees	$ 471	$ -
400	5462	Postage	$ 5,489	$ 16,475
400	5464	Printing	$ 1,254	$ 7,823
400	5470	Software Programs & Updates	$ 16,199	$ 28,553
400	5475	Office Supplies	$ 10,462	$ 43,021
400	5480	Telephone	$ 16,694	$ 16,275
400	5495	Water Conservation/CC Report Materials	$ -	$ 2,100

Calaveras Public Utility District
Operations Expinditure Account Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

			Actual	Budget	
Operations Expense	Division	500	$ 145,765	$ 313,311	47%

Division	GL	Description	Actual Expense (July-Dec)	Budget FY22-23	
500	5520	Water Supply	$ -	$ -	
500	5532	Repairs & Maintenance - Automotive	$ 12,350	$ 8,757	141%
500	5533	Repairs & Maintenance -Dams and Hydros	$ -	$ 10,500	0%
500	5534	Repairs & Maintenance -Pumping	$ 2,330	$ 4,200	55%
500	5535	Repairs & Maintenance -Treatment	$ 4,589	$ 12,075	38%
500	5536	Repairs & Maintenance -T&D	$ 24,254	$ 78,250	31%
500	5540	Fuel	$ 17,117	$ 34,500	50%
500	5545	Materials and Supplies-Pumping	$ 628	$ 4,568	14%
500	5546	Materials and Supplies-Hydros	$ 15	$ 3,675	0%
500	5547	Materials and Supplies-Treatment	$ 26,228	$ 47,250	56%
500	5548	Materials & Supplies-T&D	$ 36,735	$ 46,568	79%
500	5550	Chemicals	$ 10,405	$ 14,175	73%
500	5555	Meters - Meter Repairs	$ 1,586	$ 31,500	5%
500	5566	Safety Equipment	$ 1,640	$ 2,993	55%
500	5585	Tools	$ 2,945	$ 5,250	56%
500	5590	Clothing & Boot Allowance	$ 2,797	$ 4,800	58%
500	5592	CPUD- Other Clothing	$ 2,148	$ 4,252	51%

Calaveras Public Utility District
Outside Services Expenditure Account Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

			Actual	Budget	
Outside Services	Division	600	$ 79,015	$ 206,051	38%

Division	GL	Description	Actual Expense (July-Dec)	Budget FY22-23	
600	5605	Administration Services	$ 40	$ -	
600	5606	Answering Service	$ 1,541	$ 2,499	62%
600	5610	Bank Charges	$ 2,905	$ 1,377	211%
600	5615	Billing Services	$ 2,089	$ 1,224	171%
600	5625	Water Conservation Services	$ -	$ -	
600	5630	Accounting Services	$ -	$ 12,750	0%
600	5632	IT & Computer Support	$ 100	$ 3,000	3%
600	5635	Engineering-Non-Capital	$ -	$ 45,000	0%
600	5640	Special Projects	$ -	$ -	
600	5645	Legal Services	$ 12,803	$ 48,960	26%
600	5647	Human Resources Consultants	$ -	$ 1,500	0%
600	5650	Financial Consultants	$ 11,755	$ 47,430	25%
600	5655	Community Relations	$ -	$ 12,240	0%
600	5660	Misc. Medical	$ -	$ -	
600	5665	Pre-Employment	$ 264	$ 1,200	22%
600	5670	Janitorial	$ 1,810	$ 3,264	55%
600	5675	Bond Administration	$ -	$ -	
600	5680	Security	$ -	$ 3,723	0%
600	5685	Lab & Sampling	$ 1,970	$ 9,384	21%
600	5690	Grant Writers	$ -	$ -	
600	5695	Consultants-Dam	$ 21,036	$ 12,500	168%
600	5699	Other Contracted Services	$ 22,702	$ -	

Calaveras Public Utility District
Equipment Rent, Taxes and Utilities Expenditure Account Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

			Actual	Budget	
Equipment Rent, Taxes, and Utilities	Division	700	$ 34,077	$ 250,817	14%

Division	GL	Description	Actual Expense (July-Dec)	Budget FY22-23	
700	5710	Occupancy (rent)	$ 1,402	$ -	
700	5720	Equipment Rental	$ 8,580	$ 7,875	109%
700	5730	Property Taxes	$ 1,522	$ -	
700	5740	Electricity-Pumping	$ 2,296	$ 208,316	1%
700	5741	Electricity-Hydros	$ 7,224	$ 3,833	188%
700	5742	Electricity-Treatment	$ 6,876	$ 16,398	42%
700	5743	Electricity-Office	$ 2,489	$ 4,018	62%
700	5750	Natural Gas	$ -	$ -	
700	5760	Sewer and Garbage	$ 3,688	$ 10,378	36%

Calaveras Public Utility District
Capital Projects Expenditure Account Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

			Actual	Budget
Capital Projects	Division	800	$ 1,340,940	$ 2,913,729

Division	GL	Description	Actual Expense (July-Dec)	FY Budget 22-23
800	5810	Land Purchases	$ -	$ -
800	5820	Easements and Water Rights	$ -	$ -
800	5830	Buildings	$ 25,752	$ 55,000
800	5840	Equipment-Capital	$ -	$ 23,400
800	5850	Engineering-Capital	$ 399,695	$ 595,647
800	5860	Construction-Capital	$ 915,265	$ 2,239,682
800	5870	Materials for Capital Projects	$ 228	
800	5880	District Personnel-Capital	$ -	

Fiscal Year 22-23 Complete Capital Outlay from 2021-2022. Add a Capitalized Equipment Lease to Own. Add Projects if Funded through Outside Funding

Calaveras Public Utility District
Nonoperational -Debt Expenditures Account Detail
1st/2nd QTR Actual Fiscal Year Ending June 30, 2023

				Actual	Budget
Debt		Division	900	$ 66,482	$ 132,964

Division	GL	Description	Actual Expense (July-Dec)	FY 22-23
900	5910	Debt Service-Principal	$ 39,567	$ 77,001
900	5920	Debt Service-Interest	$ 26,915	$ 55,963
900	5930	Debt Issuance Costs	$ -	

Debt Payments of $132964.08/ Year for 20 years

INVESTMENT RECAP
as of December 31, 2022

Investments	Ending Balance
LAIF	1,938,904.91
El Dorado Savings CD #1	296,524.63
El Dorado Savings CD #2	285,986.80
UBS Financial Services	758,179.69
Total Investments	**3,279,596.03**

California State Treasurer
Fiona Ma, CPA

Local Agency Investment Fund
P.O. Box 942809
Sacramento, CA 94209-0001
(916) 653-3001

February 09, 2023

LAIF Home
PMIA Average Monthly Yields

CALAVERAS PUBLIC UTILITY DISTRICT

MANAGER
P.O. BOX 666
SAN ANDREAS, CA 95249

Tran Type Definitions

Account Number: 85-05-001

January 2023 Statement

Effective Date	Transaction Date	Tran Type	Confirm Number	Web Confirm Number	Authorized Caller	Amount
1/13/2023	1/12/2023	QRD	1721645	N/A	SYSTEM	10,074.55

Account Summary

Total Deposit:	10,074.55	Beginning Balance:	1,928,830.36
Total Withdrawal:	0.00	Ending Balance:	1,938,904.91

EL DORADO
SAVINGS BANK

Last statement: March 31, 2022
This statement: June 30, 2022
Total days in statement period: 91

CALAVERAS PUBLIC UTILITY DISTRICT
PO BOX 666
SAN ANDREAS CA 95249-0666

Page 1 of 1
[redacted]
(0)

Direct inquiries to:
1-800-874-9779

El Dorado Savings Bank
4040 El Dorado Road
Placerville, CA 95667

THANK YOU FOR BANKING WITH US!

Certificate Of Deposit

Account number	[redacted]
Total principal	$285,134.36
Total current balance	$285,986.80
Total interest year to date	$1,492.66

DAILY ACTIVITY

Date	Description	Additions	Subtractions	Balance
03-31	Beginning balance			$285,274.97
04-30	Interest Credit	234.48		285,509.45
05-31	Interest Credit	242.48		285,751.93
06-30	Interest Credit	234.87		285,986.80
06-30	Ending totals	711.83	.00	$285,986.80

Last statement: March 30, 2022
This statement: June 30, 2022
Total days in statement period: 92

CALAVERAS PUBLIC UTILITY DISTRICT
DONNA M LEATHERMAN
PO BOX 666
SAN ANDREAS CA 95249-0666

Page 1 of 1
[redacted]
(0)

Direct inquiries to:
1-800-874-9779

El Dorado Savings Bank
4040 El Dorado Road
Placerville, CA 95667

THANK YOU FOR BANKING WITH US!

Certificate Of Deposit

Account number	[redacted]
Total principal	$293,679.89
Total current balance	$296,524.63
Total interest year to date	$1,466.20

DAILY ACTIVITY

Date	Description	Additions	Subtractions	Balance
03-30	Beginning balance			$295,535.57
03-31	Interest Credit	251.00		295,786.57
04-30	Interest Credit	243.11		296,029.68
05-31	Interest Credit	251.43		296,281.11
06-30	Interest Credit	243.52		296,524.63
06-30	**Ending totals**	**989.06**	**.00**	**$296,524.63**

UBS

UBS Financial Services Inc.
1780 Hughes Landing Blvd
3 Hughes Landing, Suite 200
The Woodlands TX 77380-4021

ANQ70001647490123 EM 0

Business Services Account

January 2023

CALAVERAS PUBLIC UTILITY DIST.
ATTN TRAVIS SMALL
P O BOX 666
SAN ANDREAS CA 95249-0666

Account name: CALAVERAS PUBLIC UTILITY DIST.
ATTN TRAVIS SMALL

Account number: EM 16958 70

Your Financial Advisor:
EBERT, RICHARD
Phone: 281-362-6360/866-215-5651

Questions about your statement?
Call your Financial Advisor or the ResourceLine at 800-762-1000, account 735016958.

Visit our website:
www.ubs.com/financialservices

Items for your attention

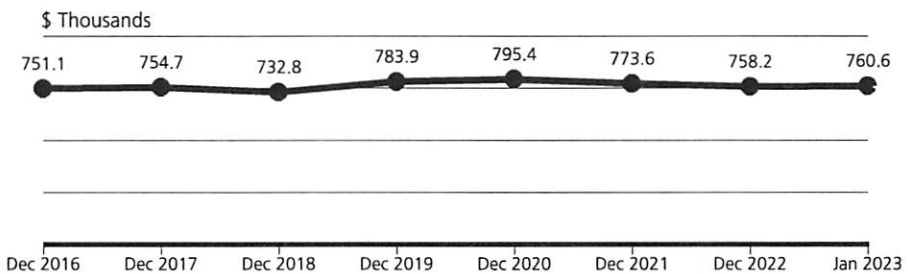
- Help protect yourself from fraud and review bank, credit card, and brokerage statements regularly. Also, get your free credit report annually from www.annualcreditreport.com.

Value of your account

	on December 30 ($)	on January 31 ($)
Your assets	758,179.69	760,588.81
Your liabilities	0.00	0.00
Value of your account	**$758,179.69**	**$760,588.81**
Accrued interest in value above	$2,858.72	$3,723.17

As a service to you, your portfolio value of $760,588.81 includes accrued interest.

Tracking the value of your account



Sources of your account growth during 2023

Value of your account at year end 2022	$758,179.69
Net deposits and withdrawals	$5.25
Your investment return:	
Dividend and interest income	$194.69
Change in value of accrued interest	$864.45
Change in market value	$1,344.73
Value of your account on Jan 31, 2023	**$760,588.81**

Your account balance sheet

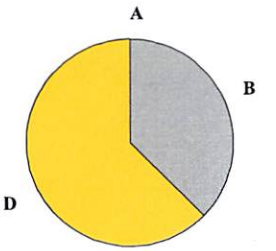
The value of your account includes assets held at UBS and certain assets held away from UBS. See page 1 for more information.

Summary of your assets

		Value on January 31 ($)	Percentage of your account
A	Cash and money balances	0.15	0.00%
B	Cash alternatives	284,448.94	37.40%
C	Equities	0.00	0.00%
D	Fixed income	476,139.72	62.60%
E	Non-traditional	0.00	0.00%
F	Commodities	0.00	0.00%
G	Other	0.00	0.00%
Total assets		**$760,588.81**	**100.00%**

Value of your account **$760,588.81**

Your current asset allocation



Eye on the markets

Index	Percentage change January 2023	Percentage change Year to date
S&P 500	6.28%	6.28%
Russell 3000	6.89%	6.89%
MSCI - Europe, Australia & Far East	8.11%	8.11%
Barclays Capital U.S. Aggregate Bond Index	3.08%	3.08%

Interest rates on January 31, 2023

3-month Treasury bills: 4.62%

One-month LIBOR: 4.57%

One-month SOFR: 4.31%

Change in the value of your account

	January 2023 ($)	Year to date ($)
Opening account value	**$758,179.69**	**$758,179.69**
Deposits, including investments transferred in	5.25	5.25
Dividend and interest income	194.69	194.69
Change in value of accrued interest	864.45	864.45
Change in market value	1,344.73	1,344.73
Closing account value	**$760,588.81**	**$760,588.81**

Dividend and interest income earned

For purposes of this statement, taxability of interest and dividend income has been determined from a US tax reporting perspective. Based upon the residence of the account holder, account type, or product type, some interest and/or dividend payments may not be subject to United States (US) and/or Puerto Rico (PR) income taxes. The client monthly statement is not intended to be used and cannot be relied upon for tax purposes. Clients should refer to the applicable tax reporting forms they receive from UBS annually, such as the Forms 1099 and the Forms 480, for tax reporting information. It is the practice of UBS to file the applicable tax reporting forms with the US Internal Revenue Service and PR Treasury Department, and in such forms accurately classify dividends and/or interest as tax exempt or taxable income. Please consult your individual tax preparer.

	January 2023 ($)	Year to date ($)
Taxable dividends	193.29	193.29
Taxable interest	0.15	0.15
Total current year	**$193.44**	**$193.44**
Prior year adjustment	1.25	1.25
Total dividend & interest	**$194.69**	**$194.69**

Summary of gains and losses

Values reported below exclude products for which gains and losses are not classified.

	Realized gains and losses		Unrealized
	January 2023 ($)	Year to date ($)	gains and losses ($)
Short term	0.00	0.00	816.98
Long term	0.00	0.00	-22,583.45
Total	**$0.00**	**$0.00**	**-$21,766.47**

Cash activity summary

See *Account activity this month* for details. Balances in your Sweep Options are included in the opening and closing balances value. FDIC insurance applies to deposits at UBS Bank USA and all banks participating in the UBS FDIC-Insured Deposit Program and the UBS Insured Sweep Program. It does not apply to deposits at UBS AG, Stamford Branch. SIPC protection applies to money market sweep fund holdings but not bank deposits. See *Important information about your statement* on the last two pages of this document for details.

	January 2023 ($)	Year to date ($)
Opening balances	**$38,432.17**	**$38,432.17**
Additions		
Deposits and other funds credited	5.25	5.25
Dividend and interest income	194.69	194.69
Proceeds from investment transactions	210,950.35	210,950.35
Total additions	**$211,150.29**	**$211,150.29**
Subtractions		
Funds withdrawn for investments bought	-249,582.31	-249,582.31
Total subtractions	**-$249,582.31**	**-$249,582.31**
Net cash flow	**-$38,432.02**	**-$38,432.02**
Closing balances	**$0.15**	**$0.15**

UBS Bank USA Business Account APY

Interest period Dec 7 - Jan 8

Opening UBS Bank USA Business balance Dec 7	$35,544.70
Closing UBS Bank USA Business balance Jan 8	$0.00
Number of days in interest period	33
Average daily balance	$30,585.47
Interest earned	$1.40
Annual percentage yield earned	0.05%

Your investment objectives:

You have identified the following investment objectives for this account. If you have questions about these objectives, disagree with them, or wish to change them, please contact your Financial Advisor or Branch Manager. You can find a full description of the alternative investment objectives in *Important information about your statement* at the end of this document.

Your return objective:
Current income
Your risk profile:
Primary - Conservative
Investment eligibility consideration - None selected

Your account instructions

- Your account cost basis default closing method is FIFO, First In, First Out.

Your assets

Some prices, income and current values shown may be approximate. As a result, gains and losses may not be accurately reflected. See *Important information about your statement* at the end of this document for more information.

Cash

Cash and money balances

Holding	Opening balance on Jan 1 ($)	Closing balance on Jan 31 ($)	Price per share on Jan 31 ($)	Average rate	Dividend/Interest period	Days in period	Cap amount ($)
Cash	84.02	0.15					
UBS BANK USA BUS ACCT	38,348.15	0.00					250,000.00
Total	**$38,432.17**	**$0.15**					

Cash alternatives

Money market instruments

Holding	Trade date	Quantity	Purchase price ($)	Cost basis ($)	Price on Jan 31 ($)	Value on Jan 31 ($)	Unrealized gain or loss ($)	Holding period
U S TREASURY BILL MATURES 06/29/23 CUSIP 912796ZR3	Jan 03, 23	255,000.000	97.799	249,389.02	98.120	250,206.00	816.98	ST

Money market funds

Money market funds are neither insured nor guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Institutional prime and institutional municipal funds must float their net asset values (NAV) per share to the nearest 1/100th of a cent (e.g., $1.0000). Government and retail money market funds will continue to transact at a stable $1.00 net asset value. Although money market funds seek to preserve the value of your investment at $1.00 per share, it is possible to lose money by investing in these funds.

Total reinvested is the total of all reinvested dividends. It does not include any cash dividends. It is not a tax lot for the purposes of determining holding periods or cost basis. The shares you receive each time you reinvest dividends become a separate tax lot.

Cost basis is the total purchase cost of the security, including reinvested dividends. The cost basis may need to be adjusted for return of capital payments in order to determine the adjusted cost basis for tax reporting purposes.

Unrealized (tax) gain or loss is the difference between the current value and the cost basis and would generally be your taxable gain or loss if the security was sold on this date. The unrealized (tax) gain or loss may need to be adjusted for return of capital payments in order to determine the realized gain or loss for tax reporting purposes.

Investment return is the current value minus the amount you invested. It does not include shares that are not reflected on your statement, including shares that have been realized as either a gain or a loss. It also does not include cash dividends that were not reinvested.

Holding	Number of shares	Purchase price/ Average price per share ($)	Client investment ($)	Cost basis ($)	Price per share on Jan 31 ($)	Value on Jan 31 ($)	Unrealized gain or loss ($)	Investment return ($)	Holding period
UBS SELECT TREASURY INSTITUTIONAL FUND	34,242.940				1.0000	34,242.94			

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Your assets › **Cash alternatives** › **Money market funds** (continued)

Holding	Number of shares	Purchase price/ Average price per share ($)	Client investment ($)	Cost basis ($)	Price per share on Jan 31 ($)	Value on Jan 31 ($)	Unrealized gain or loss ($)	Investment return ($)	Holding period
EAI: $1,431 Current yield: 4.18%									

Fixed income

Certificates of deposit and share certificates

Cost basis has been adjusted for accreted original issue discount (OID) on long-term (more than 1 year) CDs and share certificates. Cost basis has been adjusted automatically for amortization of premium using the constant yield method on long-term (more than 1 year) CDs and share certificates.

CDs are insured by the FDIC up to $250,000 per depositor per ownership category, but are not protected by SIPC. For FDIC insurance purposes, balances of CDs issued by UBS Bank USA are combined with your other deposit balances held at UBS Bank USA, including deposits through the UBS cash sweep programs and UBS Core Savings.

FDIC insurance is calculated by ownership category (e.g., single, joint, retirement, business, trust). As a result, you will need to review your deposit amounts in each ownership category to determine whether your deposit balances are fully insured. For more information, visit www.fdic.gov. Please review this section as well as the "Cash" and "Cash alternatives" sections to review the current deposit balances held at UBS Bank USA.

Share certificates are NCUA insured up to $250,000 in principal and accrued and posted dividends per qualifying account and per credit union, in accordance with NCUA rules. Yankee CDs are not insured by FDIC or NCUA.

Holding	Trade date	Total face value at maturity ($)	Purchase price ($)	Adjusted cost basis ($)	Price on Jan 31 ($)	Value on Jan 31 ($)	Unrealized gain or loss ($)	Holding period
GOLDMAN SACHS BANK NY US RATE 02.8000% MAT 02/28/2023 FIXED RATE CD ACCRUED INTEREST $2,333.58 CUSIP 38148PYQ4 EAI: $2,730 Current yield: 2.80%	Feb 20, 18	195,000.000	100.000	195,000.00	99.889	194,783.55	-216.45	LT
SALLIE MAE BANK UT US RATE 02.8000% MAT 02/28/2023 FIXED RATE CD ACCRUED INTEREST $1,196.71 CUSIP 795450L78 EAI: $1,400 Current yield: 2.80%	Feb 21, 18	100,000.000	100.000	100,000.00	99.889	99,889.00	-111.00	LT
BMO HARRIS BK NA IL US RATE 00.8000% MAT 03/18/2026 FIXED RATE CD CALLABLE 03/18/2023 @ 100.0000 ACCRUED INTEREST $192.88 CUSIP 05600XCL2 EAI: $1,600 Current yield: 0.90%	Feb 26, 21	200,000.000	100.000	200,000.00	88.872	177,744.00	-22,256.00	LT
Total		**$495,000.000**		**$495,000.00**		**$472,416.55**	**-$22,583.45**	

Total accrued interest: $3,723.17

Total estimated annual income: $5,730

Your assets (continued)

Your total assets

		Value on Jan 31 ($)	Percentage of your account	Cost basis ($)	Estimated annual income ($)	Unrealized gain or loss ($)
Cash	**Cash and money balances**	**0.15**		**0.15**		
Cash alternatives	Money market instruments	250,206.00		249,389.02		816.98
	* Money market funds	34,242.94			1,431.00	
	Total cash alternatives	**284,448.94**	**37.40%**	**249,389.02**	**1,431.00**	**816.98**
Fixed income	Certificates of deposits and share certificates	472,416.55		495,000.00	5,730.00	-22,583.45
	Total accrued interest	3,723.17				
	Total fixed income	**476,139.72**	**62.60%**	**495,000.00**	**5,730.00**	**-22,583.45**
Total		**$760,588.81**	**100.00%**	**$744,389.17**	**$7,161.00**	**-$21,766.47**

* Missing cost basis information.

Account activity this month

For more information about the price/value shown for restricted securities, see *Important information about your statement* at the end of this document.

Date	Activity	Description	Your expense code	Quantity/ Face value	Price/Value ($)	Cash amount ($)	Cash and money balance ($)
Dec 30		**Cash and money balance**					**$38,432.17**
Jan 3	Interest	UBS BANK USA BUSINESS ACCOUNT AS OF 12/30/22				1.25	
Jan 3	Transfer	MISCELLANEOUS ADJUSTMENT				5.25	38,438.67
Jan 4	Sold	UBS SELECT TREASURY INSTITUTIONAL FUND SYMBOL: SETXX		-210,950.350		210,950.35	
Jan 4	Interest	UBS BANK USA BUSINESS ACCOUNT				.15	
Jan 4	Bought	UNITED STATES TREAS BILL DUE 06/29/23 PRINCIPAL PURCHASE DISC 4.5050 16338 YTM = 4.670 CUSIP: 912796ZR3		255,000.000	97.7975560	-249,389.02	0.15
Jan 31	Dividend	UBS SELECT TREASURY INSTITUTIONAL FUND SYMBOL: SETXX				193.29	

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Account activity this month (continued)

Date	Activity	Description	Your expense code	Quantity/ Face value	Price/Value ($)	Cash amount ($)	Cash and money balance ($)
Jan 31	Reinvestment	UBS SELECT TREASURY INSTITUTIONAL FUND DIVIDEND REINVESTED AT 1.00 NAV ON 01/31/23 SYMBOL: SETXX		193.290		-193.29	0.15
Jan 31		**Closing cash and money balance**					**$0.15**
		Proceeds from investment transactions					**$210,950.35**
		Funds used for investment transactions					**-$249,582.31**

	Date	Activity	Description	Amount ($)
Money balance activities	**Dec 30**	**Balance forward**		**$38,348.15**
	Jan 3	Deposit	UBS BANK USA BUSINESS ACCOUNT AS OF 12/30/22	1.25
	Jan 3	Deposit	UBS BANK USA BUSINESS ACCOUNT	84.02
	Jan 4	Withdrawal	UBS BANK USA BUSINESS ACCOUNT	-38,433.42
	Jan 31	**Closing UBS Bank USA Business Account**		**$0.00**

CALAVERAS PUBLIC UTILITY DISTRICT

Board of Directors
J.W. Dell'Orto – President
Richard Blood – Director
Scott Speer – Director
Brady McCartney – Director
Vacant – Director

Director Assignments

District AD HOC Committees

Negotiation Committee	Richard Blood	Brady McCartney

Joint Power Authorities	**Primary**	**Alternate**
ACWA/JPIA	Richard Blood	Jack Tressler
Calaveras-Amador Mokelumne River Authority (CAMRA)	J.W. Dell 'Orto	Richard Blood
Calaveras Public Power Agency (CPPA)	Jack Tressler	J.W. Dell 'Orto
Upper Mokelumne River Watershed Authority (UMRWA)	Richard Blood	Jack Tressler

Local/Regional Organizations of Interest

CPUD/CCWD Water AD HOC Committee	J.W. Dell 'Orto	Brady McCartney
Association of California Water Agencies (ACWA)	_____	
Calaveras LAFCO		VACANT
Mokelumne River Association (MRA)		All Board Members
Mountain Counties Water Resources Association (MCWRA)		All Board Members

Monthly Maintenance Report
JANUARY 2023

LOCATION	DESCRIPTION OF WORK	STATUS
Jeff Davis WTP	Monthly operation and maintenance	Complete
	Routine water sampling and State reporting, WTP compliance Items	Complete
	Annual OSG maintenance & Cell cleaning (PSI)	Complete
	Treated Water = 16,957,247 Gallons	Complete
	Sold Water = 14,540,538 Gallons	Complete
	Below Spill 12' Below Spill	Ongoing
	Quarterly DBP's (THM & HAA5)	Complete
Warehouse Shop	Routine Operation's	Ongoing
South Fork Pump Station	Weekly routine checks	Complete
	Raw Water Pumped = 0 Acre Feet	Ongoing
	6 " over Spill- one pump running	Ongoing
	River Debris removal at Sump/Gate	Complete
Schaads Reservoir	Weekly checks	Complete
	All Units are on (transformer repair) D.Moss	Ongoing
	3" over Spill	Ongoing
Glencoe Pump Station	Weekly checks - routine monitoring	Complete
Ponderosa PRV Hydro	Weekly checks - routine monitoring	Complete
MCV PRV Hydro	Weekly checks - routine monitoring	Complete
Garamendi's PRV Hydro	Weekly checks - routine monitoring	Complete
San Andreas Distribution	Routine operations, sampling	Complete
	Main Line leak Pope Street 4" Steel	Complete
Moke Hill Distribution	Routine operations, sampling	Complete
	Water Tank Grounds Maintenance	Complete
Glencoe Distribution	Routine operations	Complete
Paloma Distribution	Routine operations, sampling	Complete
Rail Road Flat Distribution	Routine operations, sampling	Complete
	SCADA Panel upgrade at Pump Station	Ongoing
Red Hawk Res.	Drain Valve Wheel Repair (Herds Welding)	Complete
Safety/Training	Routine Safety Talks	Ongoing
	Annual Asbestos cement Pipe Refresher	Complete
Spray Program	Spring application bare ground/roads Pre-emergent	Ongoing
Vehicle Maintenance	Ditchwich Vac. Oil Change/Maint.. @ Brawners	Complete
Other		
	Annual Water Diversion Reporting (SWRCB Water Rights) X4	Complete
	Sanitary Survey (SWRCB Division of Drinking Water)	Complete
	40 USA tags completed	Complete
	13 Customer service/work orders	Complete
	Monthly meter reading	Complete
	Complaints- Pressure/ 0 odor/1 odor	Complete
	S.A.F.E.R. system evaluation	Complete