STATE WATER RESOURCES CONTROL BOARD

NORTHEAST TULARE COUNTY REGIONAL WATER SUPPLY FEASIBILITY STUDY

TULARE COUNTY
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State Water Resources Control Board
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ABBREVIATIONS

ACS	American Community Survey
ADD	Average Daily Demand
AF	Acre-feet
AID	Alta Irrigation District
AMR	Automatic Meter Reading
APN	Assessor's Parcel Number
ARPA	American Rescue Plan Act
BAC-T	Bacteriological Test
BAT	Best Available Technology
bgs	below ground surface
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CPUC	California Public Utilities Commission
CPUD	Cutler Public Utility District
COSWPA	Cutler Orosi Surface Water Project JPA
CSA	County Service Area
CSD	Community Services District
CT	Concentration for a required Time
CWC	Community Water Center
CWD	County Water District
CVP	Central Valley Project
DBP	Disinfection By-Product
DBCP	1,2-Dibromo-3-Chloropropane
DDW	State Water Board Division of Drinking Water
DFA	State Water Board Division of Financial Assistance
DWR	California Department of Water Resources
DWSRF	Drinking Water State Revolving Fund
eAR	Electronic Annual Report
EDWG	Expedited Drinking Water Grant
EOCSD	East Orosi Community Services District
EOPCC	Engineer's Opinion of Probable Construction Cost
FKC	Friant-Kern Canal
FWA	Friant Water Authority
GAC	Granular Activated Carbon
GAMA	Groundwater Ambient Monitoring Assessment
GM	General Mineral
GP	General Physical
GPCD	Gallons per Capita per Day
GPD	Gallons per Day
GPM	Gallons per Minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
G&W	Genesee & Wyoming, Inc.
HAA5	Haloacetic Acids
HCF	Hundred Cubic Feet

hp .... horsepower
IO .... Inorganic
IS/MND .... Initial Study / Mitigated Negative Declaration
IX .... Ion Exchange
JPA .... Joint Powers Authority or Joint Powers Agency
KDSA .... Kenneth D. Schmitt and Associates
KREGSP .... Kings River East Groundwater Sustainability Plan
KRWA .... Kings River Water Association
LAFCo .... Local Agency Formation Commission
LEFA .... Legal Entity Formation Assistance
MCC .... Motor Control Center
MCL .... Maximum Contaminant Level
MDD .... Maximum Day Demand
MHI .... Median Household Income
MG .... Million Gallons
MGD .... Million Gallons per Day
mg/L .... Milligrams per Liter
MMADD .... Maximum Month Average Day Demand
MOU .... Memorandum of Understanding
MWD .... Municipal Water District
ND .... Non-Detect
NEPA .... National Environmental Policy Act
NTC .... Northeast Tulare County
NTCRSWTPS .... North Tulare County Regional Surface Water Treatment Plant Study
NTCRWA .... North Tulare County Regional Water Alliance JPA
O&M .... Operations and Maintenance
OPEETA .... SWRCB Office of Public Engagement, Equity, and Tribal Affairs
OPUD .... Orosi Public Utility District
PCA .... Possible Contaminating Activity
PER .... Preliminary Engineering Report
PFAS .... Per- and Polyfluoroalkyl Substances
PHD .... Peak Hour Demand
P&P .... Provost & Pritchard Consulting Group
PRV .... Pressure Reducing Valve
PSI .... Pounds per Square Inch
PSV .... Pressure Sustaining Valve
PUD .... Public Utility District
PVC .... Polyvinyl Chloride
RCAC .... Rural Community Assistance Corporation
RO .... Reverse Osmosis
ROW .... Right-of-Way
SAFER .... Safe and Affordable Funding for Equity and Resilience
SB 552 .... Senate Bill 552
SCADA .... Supervisory Control and Data Acquisition
SCSD .... Sultana Community Services District
SDWIS .... Safe Drinking Water Information System
SGMA .... Sustainable Groundwater Management Act
SJVR .... San Joaquin Valley Railroad
SWRCB .... State Water Resources Control Board

SWTP .... Surface Water Treatment Plant
TA .... Technical Assistance
TCP 1,2,3-Trichloropropane
TMF .... Technical, Managerial, and Financial
TOC .... Total Organic Carbon
TTHM .... Total Trihalomethane
TVRR .... Tulare Valley Railroad
UOM .... Unit of Measure
USBR .... United States Bureau of Reclamation
USDA .... United States Department of Agriculture
VFD .... Variable Frequency Drive
VOC .... Volatile Organic Compound
WWTF .... Wastewater Treatment Facility
YSCSD .... Yettem-Seville Community Services District

EXECUTIVE SUMMARY

In March 2024, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW), requested Technical Assistance (TA) through the Safe and Affordable Funding for Equity and Resilience (SAFER) Drinking Water Technical Assistance Program. The goal was to evaluate the feasibility of regional consolidation in Northeast Tulare County (NTC), covering Cutler, Orosi, East Orosi, Yettem, Seville, Monson, and Sultana. Provost & Pritchard Consulting Group (P&P) was assigned in April 2024 to prepare the Northeast Tulare County Regional Water Supply Feasibility Study (Study).

PROJECT BACKGROUND

The Study assesses the technical viability of a regional water supply, considering both groundwater and surface water options, to provide a long-term, sustainable, and affordable water supply. It includes analysis of water rights, treatment plant capacity, distribution water quality, disinfection strategy, operator requirements, system hydraulics, and potential for conjunctive use.

Over the years, numerous projects for various agencies within the NTC study area have received funding, with some in planning or feasibility stages and others nearing construction completion. The SWRCB, Division of Financial Assistance (DFA) compiled a list of funding assistance that has been provided for this area, which is provided in Appendix A and summarized in the Study. The total DFA assistance that has been provided for this area is $55,583,580.

A previous regional community engagement process in 2018 led to the formation of two Joint Powers Authorities (JPAs): the Cutler Orosi Surface Water Project JPA (COSWPA) and the North Tulare County Regional Water Alliance JPA (NTCRWA).

PROBLEM DESCRIPTION

Northeast Tulare County includes several disadvantaged communities facing water quality issues, including nitrate, TCP, and DBCP contamination. The communities all currently rely on groundwater for their drinking water supply. As a result, the communities have a desire to evaluate alternatives for a long-term sustainable water supply from potential surface and/or groundwater sources.

The NTC area has several active groundwater wells meeting drinking water standards. The total current supply capacity, combining all seven NTC communities, is 4,275 gallons per minute (GPM), with a firm source capacity of 3,475 GPM when the largest source is offline. Demands are summarized in Table ES-1.

Table ES-1 Regional NTC Water System Demands

DEMAND TYPE	RESULT (GPM)
MMADD	2,100
MDD	3,150
PHD	4,725
Fire Flow	1,500

The current firm supply capacity of 3,475 GPM is adequate to meet the region’s maximum day demand (MDD) of 3,150 GPM. However, the peak hour demand (PHD) of 4,725 GPM cannot be met by the current firm supply alone. The total water storage capacity of 1.62 million gallons (MG) across the seven communities provides sufficient capacity to meet four hours of PHD.

Several new and planned groundwater sources are expected to increase the total supply capacity to approximately 7,124 GPM, with a firm source capacity of 5,624 GPM. These sources include:

- Cutler Public Utility District (CPUD) Well C6: 750 GPM for blending will new Well C10 (expected completion 2026-2027)
- CPUD Well C10: 750 GPM (expected completion 2026-2027)
- East Orosi Well E3: 1,200 GPM (expected completion 2027)
- Yettem Well Y3: 149 GPM (expected completion 2027)

WATER SUPPLY ALTERNATIVES

The Study discusses the hydrogeologic conditions, recently developed wells, and considerations for ongoing and future groundwater supply in the region. The area features a basement complex of consolidated rocks overlain by unconsolidated deposits of Tertiary and Quaternary age. The aquifer above clay layers is generally unconfined shallow groundwater with higher concentrations of nitrate, TCP, and DBCP. Wells meeting water quality objectives have been successfully developed in the area; however, these deeper wells generally have lower yield factors compared to shallower wells.

Sites for future groundwater supplies would need to be completed on a case-by-case basis with professional hydrologists, considering contamination risks and would likely be limited to parts of the region west of Cutler and Orosi, and south of Sultana primarily due to depth to hard rock and the need to reach groundwater containing strata below confining beds that are less affected by irrigation practices.

The Study discusses the potential of utilizing surface water for municipal use in the study area. To consider a Surface Water Treatment Plant (SWTP) alternative, the region must obtain an adequate, dependable, and safe supply of surface water. The existing Friant Kern Canal (FKC) is the preferred conveyance due to its proximity to the project area and being lined.

The Study considers two potential sources for surface water supplies, the Kings River, via Alta Irrigation District (AID), with storage behind Pine Flat Dam, and the San Joaquin River with storage at Friant Dam, which is part of the Central Valley Project (CVP). The Study notes surface water costs can reach upwards of $1,500 per acre-foot during critically dry years. AID experienced zero diversion years in 2015 and 2021, and the CVP experienced zero allocations for Friant Class 1 water in 2014 and 2015.

Agreements with a Friant exchange contractor, either for CVP supply or to pump Kings River water into the FKC, will be necessary. The estimated cost of surface water supply (excluding treatment costs) is provided in Table ES-2.

Table ES-2 Estimated Surface Water Supply Cost

SUMMARY	PER AF
Water (drought) regulation/storage	$645
Water development (Purchase)	$214
AID Water Charge (2026)	$11.76
FKC Conveyance	$62.10
FKC Surcharge	$4.58
Total	**$937.44**

INFRASTRUCTURE ALTERNATIVES

The Study considers three infrastructure alternatives:

ALTERNATIVE 1 is based on a physically consolidated NTC area retaining nine (9) of the existing wells and four (4) water storage tanks, with older (pre-1990) wells and contaminated sources removed from the supply. By providing interties from Yettem to Monson, Yettem to East Orosi, and Sultana to East Orosi to complete a water distribution loop and utilizing existing and proposed interties between Sultana and Monson, Yettem and Seville, Orosi and East Orosi, and Orosi and Cutler, the alternative adds potential source redundancy to each community. If implemented, this would also prepare the infrastructure for distributing treated surface water or groundwater from a regional source, reduce reliance on small local wells by connecting the systems into one operational water system, and serve as a foundation for further alternatives, such as shared surface water supply.

The estimated cost of Alternative 1 is provided in Table ES-3.

Table ES-3 Alternative 1 Project Cost Summary

ITEM DESCRIPTION	ESTIMATED COST
Construction Costs	$22,490,000
Non-Construction Costs*	
Engineering Design (12%)	$3,508,000
Construction Management and Inspection (7%)	$2,047,000
Environmental, Legal, and Administration (5%)	$1,462,000
Cost Contingency (30%)	$8,852,000
Total Project Cost	**$38,359,000**
Groundwater Operational Costs	($142,350)
Annual Maintenance and Capital Replacement Costs	$787,150
Estimated Annual O&M Costs	**$644,800**
Present Value of O&M Costs**	**$9,593,000**
Total Life Cycle Cost	**$47,952,000**
*Does not include LAFCo and legal fees dependent on consolidated system governance selection **Present Value is based on 3% rate applied to Annual O&M Costs over a 20-year period	

ALTERNATIVE 2 leverages both groundwater and surface water resources to ensure a reliable and sustainable water supply for the communities. Understanding that existing wells will need to be retained for reliability during FKC maintenance periods, only 752 AF per year of surface water is proposed in this alternative for the SWTP, compared to the total water demand of approximately 2,656 AF per year.

The SWTP will use free chlorine for disinfection. While free chlorine is effective and cost-efficient, it can form disinfection byproducts (DBPs) when combined with organic matter. DBPs form when disinfectant residuals, like free chlorine, react with organic matter in water, posing a challenge for surface water treatment. The primary method to control DBPs is to increase the removal of total organic carbon (TOC) from the water. Local systems operating surface water treatment plants, such as those in Orange Cove and Lindsay, have faced DBP exceedances, highlighting the need for careful management. Introducing surface water from the Friant-Kern Canal, which is lower in mineral content and alkalinity, can also cause corrosion in legacy groundwater systems. To minimize DBPs, it is best to reduce TOC before chlorine addition. This can be done through optimized filtration, granular activated carbon (GAC) treatment, or blending with low-TOC groundwater. Blending, with a recommended ratio of 67% surface water to 33%

groundwater, is practical and cost-effective, also helping to dilute any contaminants. Space will be reserved for GAC vessels if needed in the future. Blending treated surface water with groundwater can help mitigate both DBP formation and general water chemistry issues, ensuring safe and compatible water quality.

An 18-inch pipeline will convey raw water from the FKC to the SWTP by gravity. The system will maintain reliability during FKC shutdowns, as the nine wells listed in Alternative 1 that will remain can meet the MDD independent of the SWTP. The SWTP will supplement existing groundwater supplies, reduce aquifer demand and benefit regional recharge efforts. Limiting the plant operation to a single 8-hour shift per day, 7 days a week, producing 1 MGD of blended water would keep the operating costs down and reduce the total cost of purchasing surface water, while retaining existing wells to supply the system during plant downtime or FKC maintenance.

The estimated cost of Alternative 2 is provided in Table ES-4.

Table ES-4 Alternative 2 Project Cost Summary

ITEM DESCRIPTION	ESTIMATED COST
Construction Costs	$47,334,000
Non-Construction Costs*	
Land Acquisition	$308,000
Engineering Design (12%)	$7,384,000
Construction Management and Inspection (7%)	$4,307,000
Environmental, Legal, and Administration (5%)	$3,077,000
Contingency (30%)	$18,723,000
Total Project Cost	**$81,133,000**
Groundwater Operational Costs	($142,350)
Surface Water Operational Costs	$1,380,000
Annual Maintenance and Capital Replacement Costs	$1,656,690
Estimated Annual O&M Costs	**$2,894,340**
Present Value of O&M Costs**	**$43,061,000**
Total Life Cycle Cost	**$124,194,000**
*Does not include LAFCo and legal fees dependent on consolidated system governance selection. **Present Value is based on 3% rate applied to Annual O&M Costs over a 20-year period	

ALTERNATIVE 3 proposes increasing the daily production capacity of the SWTP to meet the entire water demand without relying on groundwater wells, except for blending with Wells O8, O10, and EO3 for water quality purposes. This requires the SWTP to have sufficient storage and treatment capacity to deliver the MDD for the complete system, including securing an increased supply of surface water. Wells O8, O10, E3, and SL4 will be used to meet winter demand during canal maintenance periods, ensuring demands during winter months can be met with the largest well offline. Operation of these groundwater wells during the 3-month period every 3 years when the FKC is out of service would only meet demands during winter months with lower water usage.

The estimated cost of Alternative 3 is provided in Table ES-5.

Table ES-5 Alternative 3 Project Cost Summary

ITEM DESCRIPTION	ESTIMATED COST
Construction Costs (Includes 20% Contingency)	$48,472,000
Non-Construction Costs*	
Land Acquisition	$308,000
Engineering Design (12%)	$7,562,000
Construction Management and Inspection (7%)	$4,411,000
Environmental, Legal, and Administration (5%)	$3,151,000
Contingency (20%)	$19,172,000
Total Project Cost	**$83,076,000**
Groundwater Operational Costs	($226,610)
Surface Water Operational Costs	$2,642,000
Annual Maintenance and Capital Replacement Costs	$1,696,520
Estimated Annual O&M Costs	**$4,111,910**
Present Value of O&M Costs**	**$61,175,000**
Total Life Cycle Cost	**$144,251,000**
*Does not include LAFCo and legal fees dependent on consolidated system governance selection **Present Value is based on 3% rate applied to Annual O&M Costs over a 20-year period	

GOVERNANCE ALTERNATIVES

The Study discusses governance structures that could include all seven public water systems and potential domestic well users. The Study identifies strengths, risks, and next steps for the most promising governance options.

The following governance alternatives are discussed:

- County Service Area: Managed by the county to provide water services.
- Special Districts: Includes County Water District, Community Services District, Municipal Water District, Municipal or Public Utility District.
- Private: Options include Mutual Water Company or investor-owned utilities, subject to California Public Utilities Commission (CPUC) approval.
- Joint Powers Authority (JPA): Collaboration between multiple entities to provide water services.

These governance options provide various pathways to ensure effective and sustainable water service delivery in Northeast Tulare County by a regional entity.

FINANCIAL ANALYSIS

A planning-level operating budget for a regional entity was prepared, covering staffing, facilities, equipment, legal requirements, and compliance. An affordability analysis was conducted, with a comprehensive rate study needed once preferred options are selected.

A regionalized water system can significantly reduce operational expenditures by consolidating duplicated efforts across multiple separate systems. The planning level operating budget was developed using financial records, rate studies, and industry knowledge, referencing OPUD's and CPUD's audited financial statements and the Yettem-Seville Water Rate Study. Operator costs, sampling, and power costs are included in the O&M costs for each alternative. Administrative costs are based on the number of connections, with nominal amounts assigned to office supplies, materials, and postage. Fixed costs such as election fees, legal fees, and annual audits are also considered. Replacement costs for key components, such as wells and tanks are estimated at $1.5 million each, while distribution system replacement costs are estimated at $20,000 per connection. Repair and maintenance costs are assumed at 1% annually, with 2.5% depreciation for wells and tanks, and 1% for pipelines. The total cost per connection is intended to reflect the whole cost of operating the water system to be covered by water rates. However, a full water rate study is needed once a preferred project is selected, to further refine cost allocations and encourage conservation. The affordability index is the cost per connection as a percentage of the median household income (MHI).

Table ES-6 Affordability of Alternatives

	MONTHLY PER CONNECTION	OPERATING BUDGET	TOTAL RATE PER CONNECTION	AFFORDABILITY INDEX
Alternative 1	$16	$41	**$57**	1.31%
Alternative 2	$72	$41	**$113**	2.59%
Alternative 3	$102	$41	**$143**	3.28%

A significant portion of the costs for Alternatives 2 and 3 is the purchase of surface water, which will be subject to negotiation and contracting with a surface water provider. It is understood that Cutler and Orosi are pursuing a draft surface water agreement with AID, which is expected to be completed in December of 2025.

SUMMARY AND NEXT STEPS

Each of the alternatives described provides benefits of increasing resiliency and long-term sustainability by joining the communities together to share water infrastructure and resources in the region. Each alternative would provide more efficient operations by eliminating contaminated sources from the system. Operating as an independent special district would further reduce the administrative costs of operating separate water systems and spread those costs over the combined population. The costs per connection presented above are reflective of a sustainable system, including capital replacement costs over the lifespan of the infrastructure.

Alternatives 2 and 3 add surface water supply to the region. The primary benefits of surface water include providing a secondary source of supply for the region and reducing the pumping of groundwater. The drawbacks to surface water are the costs both to purchase and treat the water prior to use, and potential interruption of supply in dry years. In these dry years Alternative 2 retains sufficient existing groundwater supply to cover any shortfall due to supply or costs of water purchase.

To move forward, the existing governing bodies for each water system should examine the need for a project, potential advantages and disadvantages of each alternative, and make a formal commitment to proceed with a selected alternative.

The SWRCB has requested submission of a preferred alternative and a draft Governance Term Sheet from each board by December 19, 2025. The SWRCB has expressed that fragmented or temporary governance arrangements present long-term risks to operational stability, financial integrity, and equitable service delivery, particularly for small or disadvantaged communities. The SWRCB has recommended that any governance proposal included in the draft Governance Term Sheet be a single, unified, independent special district.

1 INTRODUCTION AND PROJECT BACKGROUND

1.1 TECHNICAL ASSISTANCE

In March 2024, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW), requested Technical Assistance (TA) through the Safe and Affordable Funding for Equity and Resilience (SAFER) Drinking Water Technical Assistance Program to evaluate the technical, governance, and financial feasibility of regional consolidation in the Northeast Tulare County (NTC) area, which includes the communities of Cutler, Orosi, East Orosi, Yettem, Seville, Monson, and Sultana. In April 2024, Provost & Pritchard Consulting Group (P&P) was assigned to provide TA to the region through preparation of this Northeast Tulare County Regional Water Supply Feasibility Study (Study).

1.1.1 TECHNICAL FEASIBILITY

The Study analyzes the technical viability of a regional water supply for the NTC area, including both groundwater and surface water options, to provide a long-term, sustainable, and affordable water supply. Evaluation of a surface water treatment plant will include a focus on the ability to deliver an adequate and safe supply of drinking water to communities in the region. The Study includes analysis of water rights, treatment plant capacity, unit process design, distribution water quality concerns, disinfection strategy, operator requirements and expertise, system hydraulics, potential for conjunctive use of groundwater and surface water, and strategy for uninterrupted service during surface water conveyance maintenance. The Study makes use of previous reports and concurrent projects through coordination with local engineering staff and SWRCB.

The technical feasibility analysis includes recommendations on areas that may require further study, and potential next steps.

1.1.2 GOVERNANCE

Governance structures with the highest likelihood of success in the region to include all seven public water systems as well as the potential for domestic well users immediately adjacent to existing or future infrastructure are identified in Section 7. P&P have engaged local leadership (Tulare County and water system boards of directors) to share information and gain perspective. The SWRCB Office of Public Engagement, Equity, and Tribal Affairs (OPEETA) has led a series of ongoing community meetings to present this Study to the communities and gather input on the path forward. The recommendations of this Study make use of the successes and shortcomings of previous efforts. Significant strengths and risks for each of the potential governance structures are discussed and the next steps outlined for the governance options considered most likely to succeed.

1.1.3 FINANCIAL ANALYSIS

A planning level operating budget for a newly formed regional entity has been prepared. This includes approximations for staffing, facilities, equipment, legal requirements, and compliance. Using the developed planning level budget, an affordability analysis has been prepared. A comprehensive rate study will be necessary once the preferred technical and governance options are selected.

1.2 BACKGROUND

The northeast portion of Tulare County (County) is home to the residents of several disadvantaged communities including Cutler, Orosi, East Orosi, Sultana, Monson, Yettem and Seville (collectively, the Communities). The Communities have had issues with the domestic water supply provided by their respective community water systems. Historic and current water quality issues have included levels of nitrate, 1,2,3-Trichloropropane (TCP) and 1,2-Dibromo-3-Chloropropane (DBCP) that have exceeded the Maximum Contaminant Levels (MCLs) for those contaminants. As a result, the Communities have expressed a desire to evaluate alternatives for a long-term sustainable water supply from potential surface and/or groundwater sources.

A year-long community engagement process between entities representing Cutler, Orosi, East Orosi, Sultana, Monson, Yettem and Seville was attempted around 2018, but a split occurred between the entities resulting in the formation of two separate Joint Powers Authorities (JPAs). CPUD and OPUD formed the Cutler Orosi Surface Water Project JPA (COSWPA) and the three entities representing the other five communities formed a JPA comprised of the County (representing Yettem and Seville), Sultana Community Services District (SCSD [representing Sultana and Monson]) and the East Orosi Community Services District (EOCSD) named the North Tulare County Regional Water Alliance JPA (NTCRWA).

The locations of the Communities and service areas are shown in Figure 1-1.

1.2.1 MEDIAN HOUSEHOLD INCOME DEMOGRAPHICS

The annual median household income (MHI) and percentage of Statewide MHI per the most recent American Community Survey (ACS) 5-Year Estimates for the communities is included in Table 1-1. Cutler, Orosi, Seville, Monson and Sultana data was obtained from the 2022: ACS 5-Year Estimates Subject Tables. The most recently available ACS 5-Year Estimates for East Orosi and Yettem are 2020 and 2021: ACS 5-Year Estimates Subject Tables, respectively. A weighted average of the seven communities is 55% of the Statewide MHI, placing the Communities as a whole in the severely disadvantaged category, with only Cutler above 60% separating the Severely Disadvantaged (MHI < 60% of Statewide MHI) and Disadvantaged categories (60%-80% of Statewide MHI).

Table 1-1 Water System Details

WATER SYSTEM NAME	WATER SYSTEM NO.	POPULATION	SERVICE CONNECTIONS	ACS 5-YEAR ESTIMATE HOUSEHOLDS	ACS 5-YEAR ESTIMATE MHI (% OF STATE MHI)
Cutler PUD	CA5410001	6,200	1,232 Residential, 2 Commercial (Unmetered)	1,125	$58,692 (61%)
Orosi PUD	CA5410008	8,300	1,480 Residential, 121 Commercial (Metered)	2,104	$52,692 (55%)
East Orosi CSD	CA5401003	423	103 Residential (Metered)	133	$33,472 (35%)
Monson Water System	CA5403212	152	31 Residential (Unmetered)	36	$49,750 (52%)
Sultana CSD	CA5400824	779	239 Residential, 10 Commercial (Unmetered)	252	$38,125 (40%)
Yettem Water System	CA5403043	350	64 Residential, 2 Commercial (Unmetered)	78	$42,500 (44%)
Seville Water System	CA5400550	691	89 Residential (Metered)	90	$39,500 (41%)
	Total	16,895	3,238 Residential, 135 Commercial	Weighted Average	$52,282 (55%)

1.3 NAMING CONVENTION

The Communities each have numbered wells, which are often the same number as another community. To differentiate the wells in each community from one another, a prefix letter has been assigned. This prefix is for use in this Study only and does not appear in the State's databases or the individual communities' system information. The prefixes are as follows:

- Cutler PUD: C
- Orosi PUD: O
- East Orosi CSD: E
- Yettem Water System: Y
- Seville Water System: SV
- Monson Water System: M
- Sultana CSD: SL

1.4 CURRENT PROJECTS AND FUNDING

A number of projects have received funding in this area, some of which are ongoing, either in planning or feasibility study stages, including engineering design, while others are reaching the end of construction. State Water Board Division of Financial Assistance (DFA) compiled a list of funding assistance for the Northeast Tulare County water systems, which is attached to this Study as Appendix A. A summary of DFA funding assistance is provided in Table 1-2.

Table 1-2 Summary of DFA Assistance for NTC Water Systems

PROGRAMS	TOTAL BUDGET
Technical Assistance / Administrator	$3,017,182
Funding Agreements	$45,145,077
Interim- Emergency Project Fund	$7,421,321
Grand Total	**$55,583,580**

Date ranges for the funding assistance listed span from 2011 to present and include both drinking water projects and wastewater projects, however notably the 2015 study funded through the California Safe Drinking Water State Revolving Fund (DWSRF) is not reflected in the summary. The summary also acknowledges that SWRCB has not been the sole source of funding for the community water and wastewater systems, identifying funding from United States Department of Agriculture (USDA) and California Department of Water Resources (DWR) that are not included in the total funded by DFA. Further funding sources can be identified from previous projects and reports referenced in this Study. For example, the Cutler Public Utility District (CPUD) Well 10 Project references funding made available by the County of Tulare through American Rescue Plan Act (ARPA). The 2007 Study commissioned by Alta Irrigation District (AID), CPUD, and Orosi Public Utility District (OPUD) does not reference a funding source, however it is understood that the Harder Pond and Traver Pond projects were funded under Proposition 50 "for the specific purpose of supporting an east-side potable water supply project."

The following sections detail ongoing projects in the region. Given that each of these projects includes, or will include, its own feasibility study, Preliminary Engineering Report (PER), construction documents and funding source, this Study assumes these projects will move forward and be completed to avoid duplicating efforts.

1.4.1 CUTLER

The SWRCB encouraged the CPUD and neighboring OPUD water systems to explore the possibility of a consolidation of the two systems to resolve CPUD's water quality issues. In May 2023, the SWRCB issued a six-month voluntary consolidation letter to CPUD and OPUD. A mandatory consolidation order may be issued if CPUD and OPUD do not work out a consolidation agreement voluntarily. A draft consolidation agreement has been prepared (Appendix D), and the SWRCB has extended the original 6-month deadline to September 1, 2025 to allow more time to arrive at a final agreement and for the development of the feasibility study to inform these efforts, referred herein as the Cutler/Orosi consolidation project.

CPUD has drilled a new Well C10 and constructed a water storage and blending tank. A project to equip the new well site is underway. Draft construction documents have been submitted to the state by the District Engineer, Dennis R. Keller Consulting Civil Engineer, Inc. (Keller), describing the Well C10 equipping project, which is further described in Section 2.1.2.

CPUD has installed meters on approximately 20 of their 1,234 service connections. The Cutler/Orosi consolidation project is expected to include installing meters on the remaining unmetered connections and preparing a rate study to establish usage related charging as a pre-requisite to consolidation.

1.4.2 EAST OROSI

The SWRCB issued a 6-month consolidation letter in 2018 requiring consolidation of the East Orosi Community Services District (EOCSD) water system with OPUD. EOCSD and OPUD continue to work voluntarily towards the consolidation of EOCSD water system to OPUD. The EOCSD and OPUD consolidation project is funded through an Expedited Drinking Water Grant (EDWG).

The East Orosi/Orosi Consolidation Project is anticipated to be complete in 2027. The 2023 supplemental PER (QK, Inc., 2023) and draft construction documents (QK, Inc., 2024) were utilized in the preparation of this Study and referenced as the "East Orosi/Orosi Consolidation Project" to differentiate from the "Cutler/Orosi Consolidation Project".

Self-Help Enterprises has assisted EOCSD and the County, which is serving as the system administrator, with project funding and project management for a new well. The anticipated East Orosi/Orosi Consolidation Project will consolidate the EOCSD drinking water customers and the Family Education Center into the OPUD drinking water system.

The proposed new well site for the East Orosi/Orosi Consolidation Project is located on a property owned by the Cutler-Orosi Joint Unified School District. It is located on the north side of Avenue 408. Adjacent to the proposed well site, the School District has offices that are served by the Family Education Center water system (PWS#5403126). It is understood that part of the (well) property sale agreement includes the condition that the Family Education Center is served by this new well (i.e., consolidated). The Family Education Center is a non-transient, non-community water system that currently serves approximately 50 people per year with its single groundwater well. QK estimated the MDD of the Family Education Center at 29 GPM.

1.4.3 MONSON & SULTANA

A Supplemental Engineering Report (Provost & Pritchard Consulting Group, Inc., 2018) for SCSD was submitted in response to comments received during the review of a Construction Financial Assistance Application through the DWSRF program. The Supplemental Engineering Report recommended installation of a new well in Sultana (Well SL4) and an interconnecting water main approximately 3 miles in length between Sultana and Monson to supplement the water supply for both Sultana and Monson. The two water systems have been hydraulically connected by the construction of the interconnection and will be integrated into a common supervisory control and data acquisition (SCADA) system. In addition, radio-read water meters are being installed on each water service connection, including an automatic meter reading (AMR) system for the operator to read the SCSD and Monson water meters.

The final Engineering Report (Provost & Pritchard Consulting Group, Inc., 2024) was completed in September 2024. The current water system improvement project is expected to resolve SCSD's water supply and water quality issues by providing a new, reliable water source, Well SL4. Once the new well is online, existing Well SL2, which has a history of DBCP and nitrate contamination, will be removed. The interconnection with Monson provides redundancy of supply to both systems.

Completion of construction is imminent at the time this Study was completed. Initial Well SL4 start-up was completed in May 2025, but it is not yet discharging to the system. Some additional troubleshooting has been done, and it is expected to be online by September 2025.

1.4.4 YETTEM & SEVILLE

The overall improvements to the Yettem-Seville water system are being constructed as a phased project. Phase I was completed in 2020, and Phase II is currently in progress with an expected completion date of mid-2027, subject to extension of the funding agreement deadline due to environmental and permitting constraints. Phase II will include construction of an interconnecting pipeline between Yettem and Seville, a new Yettem well, transmission main to the existing Yettem tank site, and meters in Yettem funded by the Drinking Water State Revolving Fund (Provost & Pritchard Consulting Group, Inc., 2013).

In the interim, an application was made for drought relief for Seville to design and construct an additional emergency well, designated as Seville Well SV3. The project remains an urgent priority for the Yettem-Seville CSD and is desired to be completed as quickly as possible. The new well at the existing Seville Tank Site near Madera Street and Road 154 ultimately did not produce sufficient water and it has been proposed to use remaining funding for the test well at the proposed Yettem Well Y3 site.

1.4.5 DOMESTIC WELL USERS

Community Water Center (CWC) received funding from the SWRCB to provide TA services to residences near but outside of the OPUD and CPUD water system service areas. CWC has identified 451 households within six sub-areas surrounding the unincorporated communities of Cutler and Orosi, which need a long-term drinking water solution due to declining groundwater levels and high levels of nitrate that are impacting the private domestic wells in the area. The Domestic Well Feasibility study is expected to be completed in the third quarter of 2025.

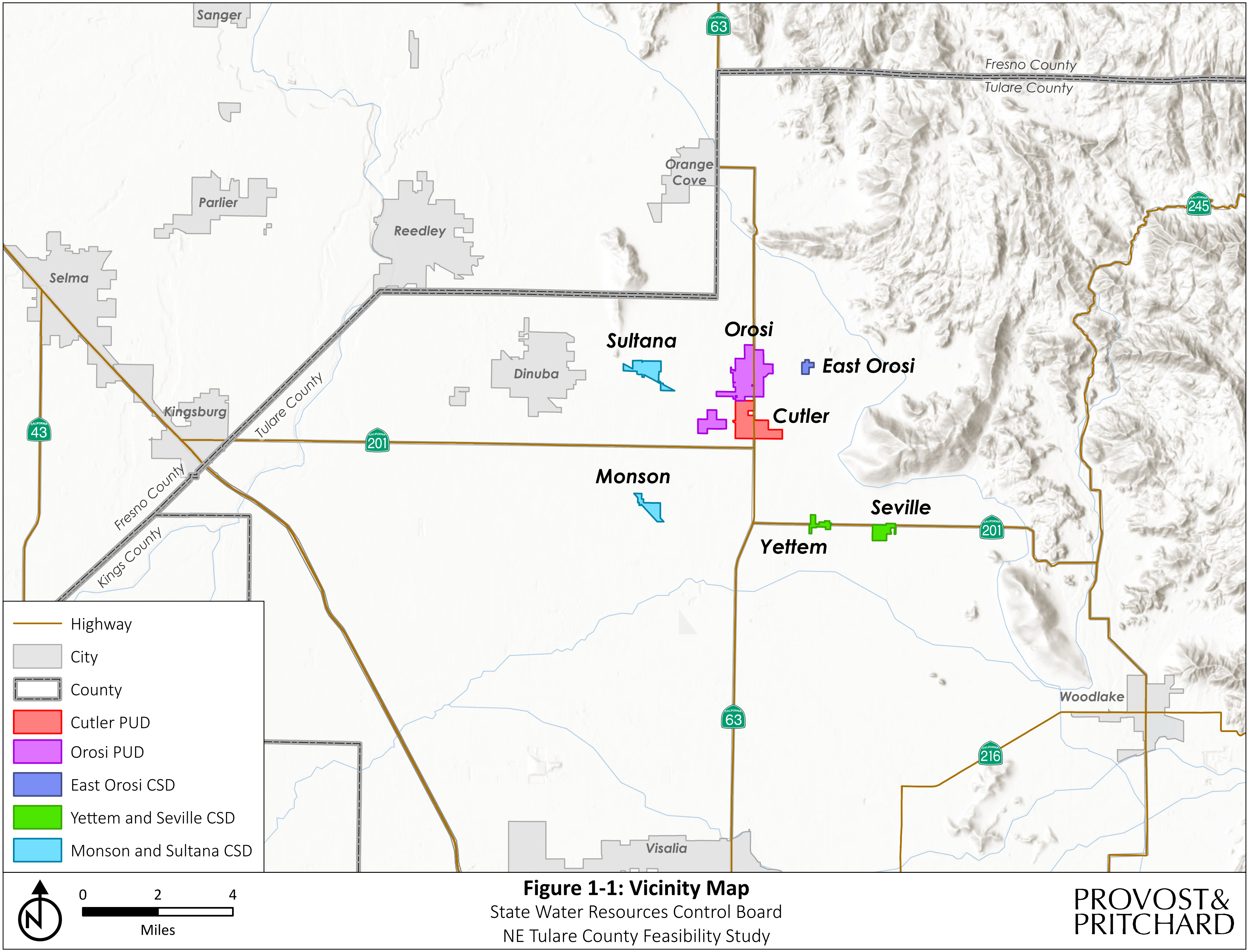

Figure 1-1: Vicinity Map

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2 EXISTING SYSTEMS

2.1 CUTLER PUBLIC UTILITY DISTRICT

2.1.1 COMMUNITY DESCRIPTION

Cutler is located approximately 15 miles north of the City of Visalia, and approximately 5 miles east of the City of Dinuba. The roads within Cutler are County maintained roads and State Route 63 (SR 63) which runs north and south through the middle portions of the community.

Cutler Public Utility District, water system number CA5410001, serves the community of Cutler with an approximate population of 6,200 through 1,234 service connections. The service connections consist of 1,232 residential service connections and 2 commercial connections. CPUD relies solely on groundwater for domestic water supply purposes and operates under Domestic Water Supply Permit 03-24-22PA-019.

2.1.2 EXISTING FACILITIES

CPUD's wells are experiencing elevated nitrate and TCP levels which are jeopardizing the long-term viability of the existing water supply.

CPUD's water system has two active wells, Wells C5 and C9, and three inactive wells, Wells C3, C4, and C6, which is offline due to nitrate and DBCP. A new well, Well C10, is under construction with a 400,000-gallon blending tank. Draft construction documents, dated October 2024, have been submitted to the State by Dennis R. Keller Consulting Civil Engineer, Inc. (Keller) describing the equipping of Well C10 with funding from DWSRF and ARPA (Keller, 2024). The Domestic Water Supply Permit Amendment and most recent Sanitary Survey are attached as Appendix B

Other CPUD wells include Well C7 which was drilled by the County without a test hole and tested positive for DBCP; it has never been connected to the system. Similarly, Well C8 was a test well that was not developed due to not meeting water quality standards. CPUD has also made inquiries about use of water from a County well located at the Cutler Park, which is understood to produce water meeting drinking water quality standards. However, that well was not constructed to municipal well standards.

2.1.2.1 WATER SUPPLY SOURCES

Well C5 was drilled to a total depth of 500 feet in 1967 with perforations between 180 and 491 feet below ground surface (bgs) and a sanitary seal extending to 50 feet bgs. Well C5 has TCP and nitrate levels exceeding the MCL. It is the subject of two compliance orders, Order No. 03-24-22R-007 issued August 26, 2022, for TCP maximum contaminant level violation and Order No. 03-24-23R-006 issued September 21, 2023, for nitrate maximum contaminant level violation, attached as Appendix C. The well remains active, producing 1,000 GPM, and quarterly and monthly testing and corresponding public notifications are ongoing for TCP and nitrate exceedances. The District Engineer (Dennis R. Keller) reports it has been swaged to repair its casing multiple times and further repairs to prolong its life would not be feasible. It is understood that Well C5 will be abandoned once the Well C10 blending project is completed, and it is therefore not included in future capacity projections for this Study.

Well C6 was drilled to a total depth of 540 feet in 1979 with perforations between 315 and 325; 340 and 365; 380 and 395; 408 and 444; and 495 and 510 feet bgs, and an annular seal extending to 72 feet bgs. Well C6 is inactive due to DBCP and nitrate levels exceeding the MCLs. When active, the well had a production capacity of 1,100 GPM. CPUD intends to blend Well C6 water with water from Well C10, which is expected to enable Well 6 to be reactivated with a reduced capacity of approximately 750 GPM, matching the anticipated capacity of Well C10.

Well C9 is active and produces 300 GPM. The well was drilled to a total depth of 515 feet in July 2007 with perforations between 320 and 420 feet bgs and a cement annular seal extending to 270 feet bgs. This is currently the only compliant well for CPUD.

Well C10 has been drilled but is not yet equipped. The well was drilled to a total depth of 455 feet in September 2016, and well casing was installed to 440 feet with perforations between 295 and 430 feet bgs. The annular seal extends to 285 feet bgs. The work to complete the equipping of Well C10 is planned to be bid by Fall 2025 and be completed in late 2026 or early 2027. The estimated capacity for Well C10 is 750 GPM, based on project specifications.

2.1.2.2 WATER STORAGE

CPUD has a 50,000-gallon elevated water storage tank located at SR 63 and Alta Drive. The tank has a common inlet/outlet configuration and receives chlorinated water from the distribution system. Water from the two active well sites flows through the distribution system to the storage tank. When the water level in the storage tank drops to approximately at half of its maximum capacity, a radio signal is sent to the well sites to start the pumps. The tank was cleaned and inspected in 2021.

A 400,000-gallon blending tank, located at the Well C10 site, was constructed in October 2019. However, the tank has not been operable because Well C10 is not yet equipped or operational. This tank will provide blending of Well C10 with Well C6 water to provide additional supply for the system.

2.1.2.3 WATER TREATMENT

Continuous chlorination using sodium hypochlorite solution is provided by injection into the discharge lines of Wells C5 and C9 prior to entering the distribution system. Chlorination equipment is located at each well site and consists of 15-gallon polyethylene chemical storage tanks and chemical metering. The chlorination equipment is enclosed inside covered, fenced structures.

2.1.2.4 WATER DISTRIBUTION SYSTEM

The distribution system contains various piping materials including polyvinyl chloride (PVC), ductile iron, cast iron, steel, and varying amounts of asbestos cement pipe. System pipe sizes range from 2-inch to 10-inch. In California, the use of asbestos cement pipe was largely discontinued in the late 1970s, indicating that those parts of the system are potentially 50 years or older. The anticipated useful life of distribution piping can be 50-70 years, depending on soil type, climate, and the aggressive nature of the water. A distribution system map is provided as Figure 2-1. System pressure is maintained between 25 and 42 pounds per square inch (PSI).

2.1.2.5 SYSTEM CAPACITY

The following summary of system capacity for CPUD assumes that Well C10 will be completed and that 750 GPM of Well C6 capacity will be utilized by blending 50/50 with Well C10, which has a projected production capacity of 750 GPM. Well C5 is excluded from the total due to inability to meet water quality requirements.

Table 2-1 CPUD Water Supply from Groundwater Wells

SOURCE	YEAR DRILLED	DEPTH (FT BGS)	TOTAL CAPACITY (GPM)	NOTES
Well C5	1962	500	~~1000~~	To be abandoned
Well C6	1979	497	750	DBCP and Nitrate*
Well C9	2007	515	300	
Well C10	2016	440	750	Planned**
		Total	1800	

*Well C6 was reported to produce 1,100 GPM but will be limited by Well C10 production, and blended 50/50
**The expected production of Well C10 is 750 GPM per Project Specifications

2.1.3 EXISTING WATER SYSTEM DEMANDS

California Code of Regulations (CCR) Title 22 describes the process for estimating the Maximum Month Average Daily Demand (MMADD) for a system with monthly water usage data, based on the month with the highest water usage during the most recent ten years of operation or, if the system has been operating for less than ten years, during its period of operation. Monthly water production data for the last 5 years was provided by CPUD. The wells are the sole source of water for CPUD, and therefore, in the absence of metered usage data, the demand is assumed to equal production. The maximum month for CPUD has consistently been July. Water production during the maximum month, in million gallons (MG), over the last 5 years is presented below in Table 2-2 .

Table 2-2 CPUD Maximum Month Water Usage Data

MAXIMUM MONTH	CPUD (MG)
July 2019	32.08
July 2020	32.81
July 2021	31.85
July 2022	29.61
July 2023	30.32

2.1.3.1 MAXIMUM MONTH AVERAGE DAY DEMAND

To calculate average daily usage during the maximum month, divide the total water usage during the maximum month by the number of days in that month; the resulting MMADD for CPUD is 1.06 MG.

2.1.3.2 MAXIMUM DAY DEMAND

To calculate the MDD, multiply the MMADD by a peaking factor of 1.5; the resulting MDD for CPUD is 1.59 MG.

2.1.3.3 PEAK HOUR DEMAND

To calculate the PHD, determine the average hourly flow during MDD and multiply by a peaking factor that is a minimum of 1.5; the resulting PHD for CPUD is 1,701 GPM.

2.1.3.4 FIRE-FLOW REQUIREMENTS

The minimum fire flow and improvement standards adopted by the County that apply to unincorporated areas is conformance to Appendix B of the California Fire Code. This Study assumes the minimum fire flow of 1,500 GPM for 2 hours per Table B105.1(2) will be required, matching the most stringent requirements used by the other systems in the region. This is the minimum for buildings with no automatic fire sprinklers with fire flow calculation areas of up to 22,700 square feet for Type IA and IB construction and up to 3,600 square feet for Type V-B construction, as defined in the building code.

2.1.3.5 INDUSTRIAL AND COMMERCIAL USERS

The Safe Drinking Water Information System (SDWIS) indicates that CPUD serves 2 commercial connections.

2.1.3.6 WATER SYSTEM DEMANDS SUMMARY

The maximum annual demand for CPUD was 253 MG in 2020, which equates to 112 gallons per capita per day (GPCD).

Table 2-3 Summary of CPUD Water System Demands

DEMAND TYPE	RESULT (GPM)
MMADD	756
MDD	1,134
PHD	1,701
Fire Flow	1,500

The 2023 electronic Annual Report (eAR) reports a flat rate water charge of $27.10 per connection which applies to residential, commercial, and institutional connections.

Current certification for the Cutler system operator was retrieved from (www.waterboards.ca.gov), and shown in Table 2-4.

Table 2-4 CPUD Operator Certification

OPERATOR	CERTIFICATION No.	CERTIFICATION TYPE
Dionicio Rodriguez, Jr.	21736	D3
Dionicio Rodriguez, Jr.	7930	T3

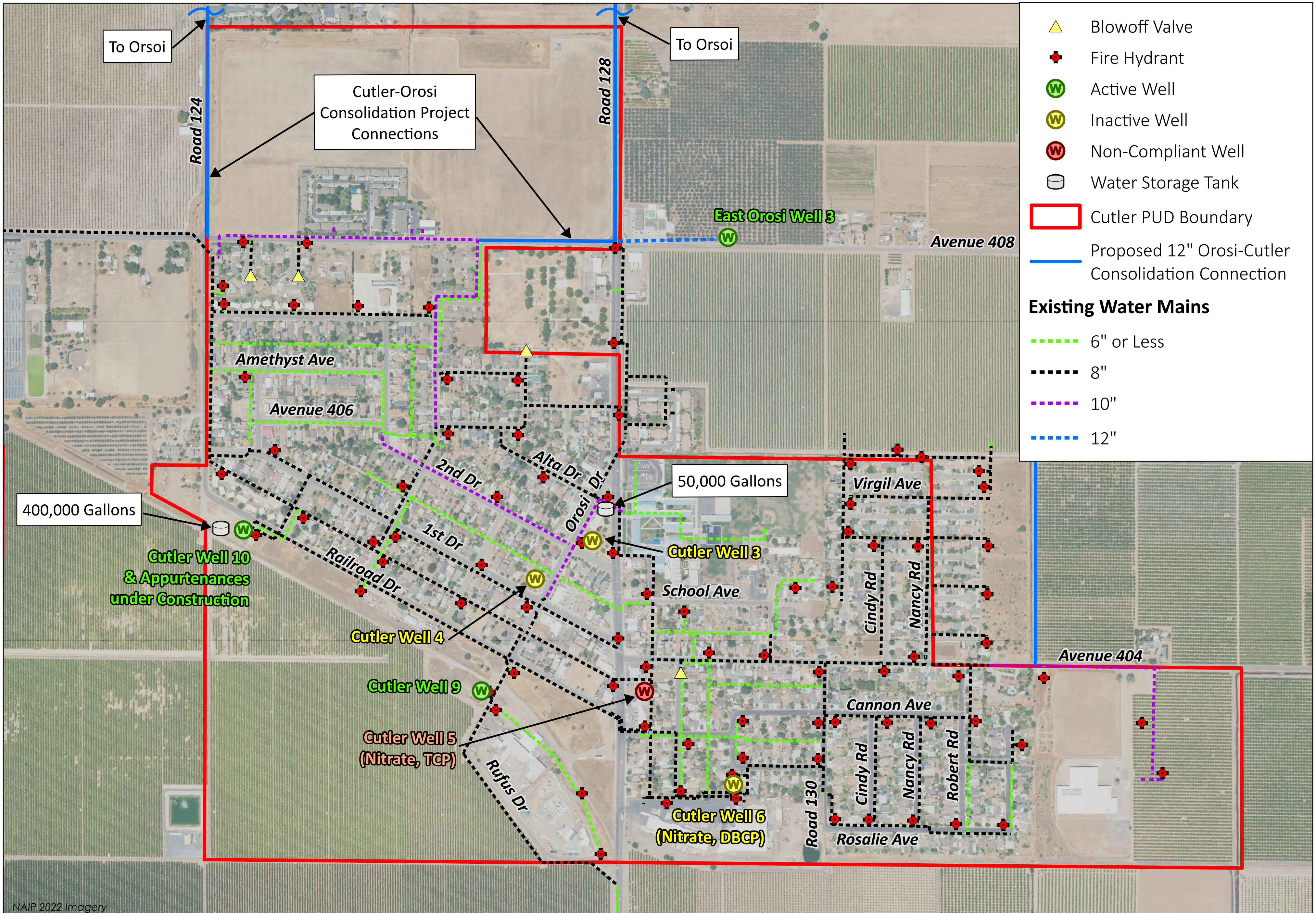

Figure 2-1: Existing Cutler Water System

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2.2 OROSI PUBLIC UTILITY DISTRICT

2.2.1 COMMUNITY DESCRIPTION

Orosi is located approximately 15 miles north of the City of Visalia, and approximately 5 miles east of the City of Dinuba. The roads within Orosi are County maintained roads and SR 63 which runs north and south through the middle portions of the community.

OPUD, water system number CA5410008, serves the community of Orosi with an approximate population of 8,300 through 1,601 service connections. The service connections consist of 1,480 residential service connections and 121 commercial connections. OPUD relies solely on groundwater for domestic water supply and operates under Domestic Water Supply Permit 03-24-21P-002.

2.2.2 EXISTING FACILITIES

OPUD has four active wells, Wells O4, O5A, O8, and O10. Wells O6, O7 and O9 are inactive and offline due to nitrate and other contaminants in the groundwater. Wells O6 and O7 have been disconnected from the system, Well O9 was a test well, but tested for nitrate in exceedance of the MCL, and was consequently never developed. The domestic water supply permit amendment and most recent sanitary survey are attached as Appendix E.

2.2.2.1 WATER SUPPLY SOURCES

Well O4 is the oldest of OPUD's active wells. Well O4 was drilled in 1966 and 12-inch casing installed to a depth of 425 feet with perforations between 180 and 425 feet, a cement annular seal is provided to a depth of 70 feet. The operator reported it had been videoed, and the casing was in poor condition.

Well O5A is located at OPUD's storage tank site and was drilled in 1990 and 12-inch casing installed to a depth of 433 feet with perforations between 200 and 433 feet, a cement annular seal is provided to a depth of 170 feet.

Well O8 was drilled in 1996 to a depth of 473 feet. The borehole contains a 14-inch diameter steel well casing to a depth of 473 feet and perforations between 190 and 473 feet, the cement annular seal was installed to a depth of 138 feet.

Well O10 is the most recently constructed well, drilled to a depth of 525 feet in 2006 and went into service in 2011. Perforations are present between 251 and 496 feet. A cement annular seal is present to a depth of 95 feet.

2.2.2.2 WATER STORAGE

OPUD has one ground level water storage tank which has a capacity of 750,000 gallons and delivers water to the system through two booster pumps located at the site of Well O5A. The welded steel water storage tank was constructed in 1995 and cleaned and inspected in 2020. There is a 10,000-gallon hydropneumatic tank at each of the active well sites. Due to the operation of a hydropneumatic tank as a pressure regulation vessel, the tank sizes are not considered for purposes of total water storage in the system.

2.2.2.3 WATER TREATMENT

The OPUD water system provides continuous chlorination treatment at each of the water system's active well sites (Wells No. O4, O5A, O8, O10). The water system uses sodium hypochlorite solution, which is fed into the distribution system by chemical metering pumps at each well site prior to entering the respective hydropneumatic pressure tank or storage tank.

2.2.2.4 WATER DISTRIBUTION SYSTEM

The distribution system includes PVC, Ductile Iron, Cast Iron, Steel, and varying amounts of asbestos cement pipe materials, similar to CPUD. System pipe sizes range from 2-inch through 16-inch. A distribution system map is provided as Figure 2-2.

2.2.2.5 SYSTEM CAPACITY

The following table summarizes OPUD groundwater supplies. Wells O6, O7 and 09 are excluded from the total as they are not connected to the system.

Table 2-5 OPUD Water Supply from Groundwater Wells

SOURCE	YEAR DRILLED	DEPTH (FT BGS)	TOTAL CAPACITY (GPM)	NOTES
Well O4	1966	425	525	
Well O5A	1990	433	525	
Well O6 (Disconnected)	1977	291	~~300~~	Nitrate
Well O7 (Disconnected)	1981	400	~~700~~	Nitrate and TCP
Well O8	1996	455	700	
Well O9 (Not Equipped)	1993	400	~~285~~	Nitrate
Well O10	2006	496	800	
		Total	**2,550**	

2.2.3 EXISTING WATER SYSTEM DEMANDS

Monthly water production data for the last 5 years was provided by OPUD. The wells are the sole source of water for OPUD. In the absence of metered usage data, the demand is assumed to equal production. Demands have been calculated, as described in Section 2.1.3. The maximum month for OPUD has consistently been July. Water production during the maximum month for OPUD over the last 5 years is presented below in Table 2-6.

Table 2-6 OPUD Maximum Month Water Usage Data

MAXIMUM MONTH	OPUD (MG)
July 2019	66.80
July 2020	41.60
July 2021	39.31
July 2022	38.80
July 2023	36.00

Review of the data supplied indicates an abnormal amount of water use in 2019. The 2019 data was therefore excluded from the calculations that follow, and July 2020 was identified as the maximum month.

2.2.3.1 MAXIMUM MONTH AVERAGE DAY DEMAND

To calculate average daily usage during maximum month, divide the total water usage during the maximum month by the number of days in that month; the resulting MMADD for OPUD is 1.34 MG.

2.2.3.2 MAXIMUM DAY DEMAND

To calculate the MDD, multiply the MMADD by a peaking factor of 1.5; the resulting MDD for OPUD is 2.01 MG.

2.2.3.3 PEAK HOUR DEMAND

To calculate the PHD, determine the average hourly flow during MDD and multiply by a peaking factor that is a minimum of 1.5; the resulting PHD for OPUD is 2,157 GPM.

2.2.3.4 FIRE-FLOW REQUIREMENTS

This Study assumes the minimum fire flow of 1,500 GPM for 2 hours per Table B105.1(2) will be required as described in Section 2.1.3.4.

2.2.3.5 INDUSTRIAL AND COMMERCIAL USERS

SDWIS indicates that OPUD serves 121 commercial connections.

2.2.3.6 WATER SYSTEM DEMANDS SUMMARY

The maximum annual demand for OPUD was 334 MG, in 2020, which equates to 110 GPCD.

Table 2-7 Summary of OPUD Water System Demands

DEMAND TYPE	RESULT (GPM)
MMADD	959
MDD	1,438
PHD	2,157
Fire Flow	1,500

The 2023 eAR reports a base rate charge of $66.75 per residential connection. Subtracting the $34.97 wastewater service charge equates to a water base rate of $31.78. The 1-inch meter water service charge is listed as $30.28, effective July 2016. The $102.27 per commercial connection, and $371.61 per institutional connection correspond to 2-inch and 4-inch meter sizes, as does the cost per gallon unit of measure (UOM) of $0.96. It is assumed the UOM was incorrectly stated in the 2023 eAR and the correct UOM is per thousand gallons as reported in the 2022 eAR.

Current certification for the Orosi system operator was retrieved from (www.waterboards.ca.gov) and is shown in Table 2-8.

Table 2-8 OPUD Operator Certification

OPERATOR	CERTIFICATION No.	CERTIFICATION TYPE
Raul Mariscal	20378	D2
Raul Mariscal	28107	T2

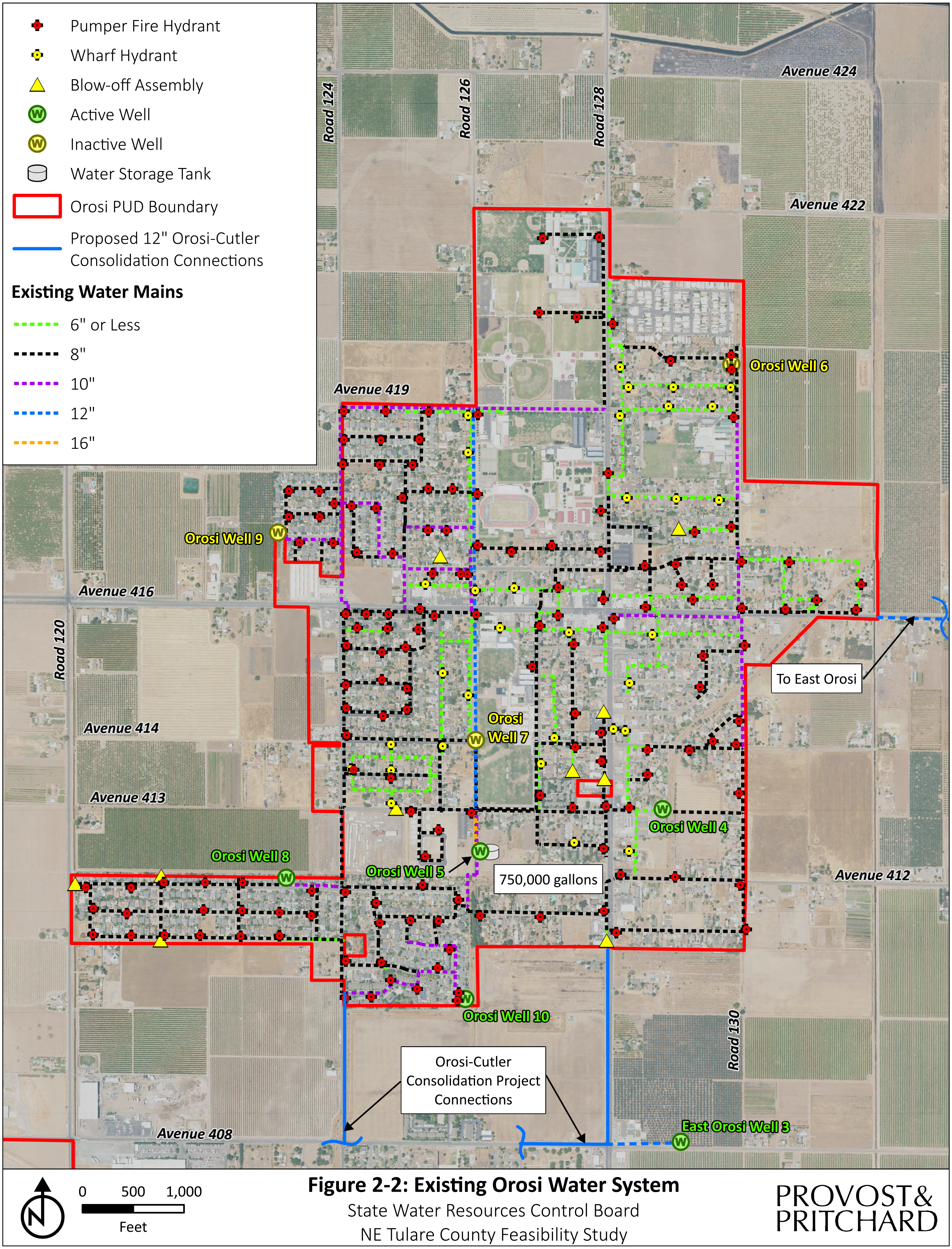

Figure 2-2: Existing Orosi Water System

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2.3 EAST OROSI COMMUNITY SERVICES DISTRICT

2.3.1 COMMUNITY DESCRIPTION

East Orosi is an unincorporated community in the County of Tulare located approximately a mile east of Orosi along Avenue 416. EOCSD, water system number CA5410003, serves the community of East Orosi with an approximate population of 423 through approximately 103 unmetered service connections consisting of residential homes and four businesses in the EOCSD service area. EOCSD relies solely on groundwater for domestic water supply purposes and operates under Domestic Water Supply Permit 03-24-19PA-023.

Residents currently receive drinking water from EOCSD; however, residents have been reliant on bottled water for over a decade due to exceedance of the nitrate MCL in both wells. The SWRCB issued a 6-month consolidation letter in 2018 requiring consolidation of EOCSD's water system with OPUD. Fresno Superior Court issued a peremptory writ of mandate on June 27, 2022, directing the SWRCB to set aside the mandatory consolidation order. EOCSD and OPUD continue to work voluntarily towards the consolidation of EOCSD's water system to OPUD. A consolidation project is being prepared and includes a new well located south of the OPUD service area on Avenue 408 which will provide water to EOCSD via a new pipeline and the OPUD distribution system.

EOCSD has had Tulare County serving as its Administrator since 2022, which was recently renewed for an additional 2-year period.

2.3.2 EXISTING FACILITIES

The EOCSD water system currently consists of two wells pumping directly to hydropneumatic pressure tanks prior to serving the distribution system. The East Orosi/Orosi Consolidation Project PER, prepared by QK, notes there are existing meters, but they are not considered accurate and have not been utilized as a basis for monthly billing. The most recent sanitary survey is attached as Appendix F.

2.3.2.1 WATER SUPPLY SOURCES

EOCSD Well E1 was drilled in 1983 to a depth of 365 feet with a sanitary seal extending to 200 feet bgs. The 10-inch casing has perforations between 220 and 360 feet. EOCSD completed a successful modification to Well E1 in 2018, which resulted in the well producing 190 GPM at a discharge pressure of 35 PSI. Due to the presence of nitrate levels exceeding the MCL in this well and the expectation it will be abandoned on completion of the consolidation with OPUD, it is not included in future capacity projections for this Study.

Well E2 was drilled in 1984 to 350 feet with a sanitary seal extending to 20 feet. The extent of perforations in the 10-inch casing is unknown. Both sources were identified as being most vulnerable to known contaminant plumes (nitrate) and septic systems. Well E2 in 2018 was reported to be producing approximately 130 GPM. Due to the presence of nitrate in this well and the expectation it will be abandoned on completion of the consolidation with, it is not included in future capacity projections for this Study.

The new supply well, Well E3, proposed by QK, is located approximately two miles southwest of East Orosi, on the north side of Avenue 408, east of the intersection with SR 63. A test well was completed in October 2016 to 550 feet, and the PER describes the expected production as being between 1,200 and 1,400 GPM. Due to this well not being complete, this Study considers only 600 GPM capacity from this well to remain conservative with supply capacity estimates.

2.3.2.2 WATER STORAGE

EOCSD system pressure is regulated by a 7,500-gallon and a 3,500-gallon hydropneumatic tank at Well E1 and Well E2, respectively. Due to the operation of the hydropneumatic tanks as pressure regulation vessels, the tank sizes are not considered for purposes of total water storage in the system. The hydropneumatic tanks are expected to be abandoned with wells E1 and E2 on completion of the East Orosi/Orosi Consolidation Project.

The East Orosi/Orosi Consolidation Project identifies the need for a storage tank for EOCSD to meet MDD and fire flow demands. Draft construction documents show the tank will have 329,600-gallons of usable storage volume located in EOCSD.

A booster pump system consisting of two pumps equipped with variable frequency drives (VFDs), each capable of providing 250 GPM at 55 PSI will draw water from the tank to the EOCSD distribution system. A 1,000 GPM high flow pump will be provided in parallel for fire flow.

2.3.2.3 WATER TREATMENT

EOCSD provides continuous chlorination of the water produced by Wells E1 and E2. The chlorination equipment is activated upon startup of the well. Sodium hypochlorite solution is injected directly into the discharge line of Wells E1 and E2 upstream of each pressure tank. The sodium hypochlorite solution is stored at the well sites in 35-gallon polyethylene tanks.

On completion of the East Orosi/Orosi Consolidation Project, chlorination will be provided at the well discharge and tank fill line by flow paced metering pumps located at the well site and at the tank site. The Draft construction documents indicate a wall mounted metering pump package and 55-gallon drum containing sodium hypochlorite to be housed in an enclosure at each site.

2.3.2.4 WATER DISTRIBUTION SYSTEM

The East Orosi/Orosi Consolidation Project report describes the distribution system as having been upgraded in 1984, to 4-inch and 6-inch PVC piping, which is now 40 years old and inadequate for fire flow. QK proposes abandoning the existing distribution system in place, to be replaced with 8-inch ductile iron piping.

The East Orosi/Orosi Consolidation Project includes metering of connections with modern remote read and recording meters compatible with OPUD's metering to facilitate either consolidation or an agreed meter maintenance/meter reading contractual service by OPUD.

2.3.2.5 SYSTEM CAPACITY

The following summary of system capacity for EOCSD assumes the new well proposed as part of the ongoing consolidation with OPUD will provide at least half the 1,200 to 1,400 GPM capacity anticipated in the East Orosi/Orosi Consolidation Project report. The two existing wells are expected to be abandoned or destroyed due to exceedance of the nitrate MCL, and are not included in the total.

Table 2-9 EOCSD Water Supply from Groundwater Wells

SOURCE	YEAR DRILLED	DEPTH (FT BGS)	TOTAL CAPACITY (GPM)	NOTES
Well E1	1983	365	~~190~~	To be Abandoned
Well E2	1984	350	~~130~~	To be Abandoned
Well E3	Anticipated in 2027	Designed for 550	600	Incomplete*
		Total	600	
*EOCSD Well 3 capacity has been estimated as 1,200 to 1,400 GPM, however the well is not yet completed. Prior to completion a conservative value of 600 GPM is used to ensure demand can be met without overreliance on this source prior to completion.				

2.3.3 EXISTING WATER SYSTEM DEMANDS

Water demands were calculated based on CCR Title 22 as described for previous systems. Monthly water production data for the last 5 years was obtained from EOCSDs eARs. The two wells are currently the sole sources of water for EOCSD. In the absence of metered usage data, the demand is assumed to equal production. The data obtained is incomplete, in part due to wellhead meters being out of service from September 2021 through 2022 and into 2023. The maximum month identified for EOCSD was June 2021. Water production during the maximum month, in MG, for EOCSD over the last 5 years is presented below in Table 2-10.

Table 2-10 EOCSD Maximum Month Water Usage Data

MAXIMUM MONTH	EOCSD (MG)
August 2019	4.67
October 2020	2.95
June 2021	4.92
2022	No Data
July 2023	2.51

2.3.3.1 AVERAGE DAY DEMAND

To calculate average daily usage during maximum month, divide the total water usage during the maximum month by the number of days in that month; the resulting MMADD for EOCSD is 0.16 MG.

2.3.3.2 MAXIMUM DAY DEMAND

To calculate the MDD, multiply the MMADD by a peaking factor of 1.5; the resulting MDD for EOCSD is 0.24 MG.

2.3.3.3 PEAK HOUR DEMAND

To calculate the PHD, determine the average hourly flow during MDD and multiply by a peaking factor that is a minimum of 1.5; the resulting PHD for EOCSD is 257 GPM.

2.3.3.4 FIRE-FLOW REQUIREMENTS

The QK Supplemental PER states “Tulare County Fire will require that 1,000 gallons per minute with a one-hour duration would be minimally satisfactory.” However, this Study assumes the minimum fire flow of 1,500 GPM for 2 hours per Table B105.1(2) will be required as previously described. The difference is due to the region being considered as one larger system for this Study.

2.3.3.5 INDUSTRIAL AND COMMERCIAL USERS

SDWIS data reflects that EOCSD serves no industrial or commercial users.

2.3.3.6 WATER SYSTEM DEMANDS SUMMARY

The maximum annual demand for EOCSD was 27 MG, in 2021, which equates to 175 GPCD.

Table 2-11 Summary of EOCSD Water System Demands

DEMAND TYPE	RESULT (GPM)
MMADD	114
MDD	171
PHD	257
Fire Flow	1,500

The 2023 eAR reports a single flat rate residential water charge of $17.15 per connection.

Current certification for both the East Orosi system operator was retrieved from (www.waterboards.ca.gov), and is shown in Table 2-12.

Table 2-12 EOCSD Operator Certification

OPERATOR	CERTIFICATION No.	CERTIFICATION TYPE
Ralph Gutierrez, Jr.	30860	D2
Ralph Gutierrez, Jr.	27334	T2

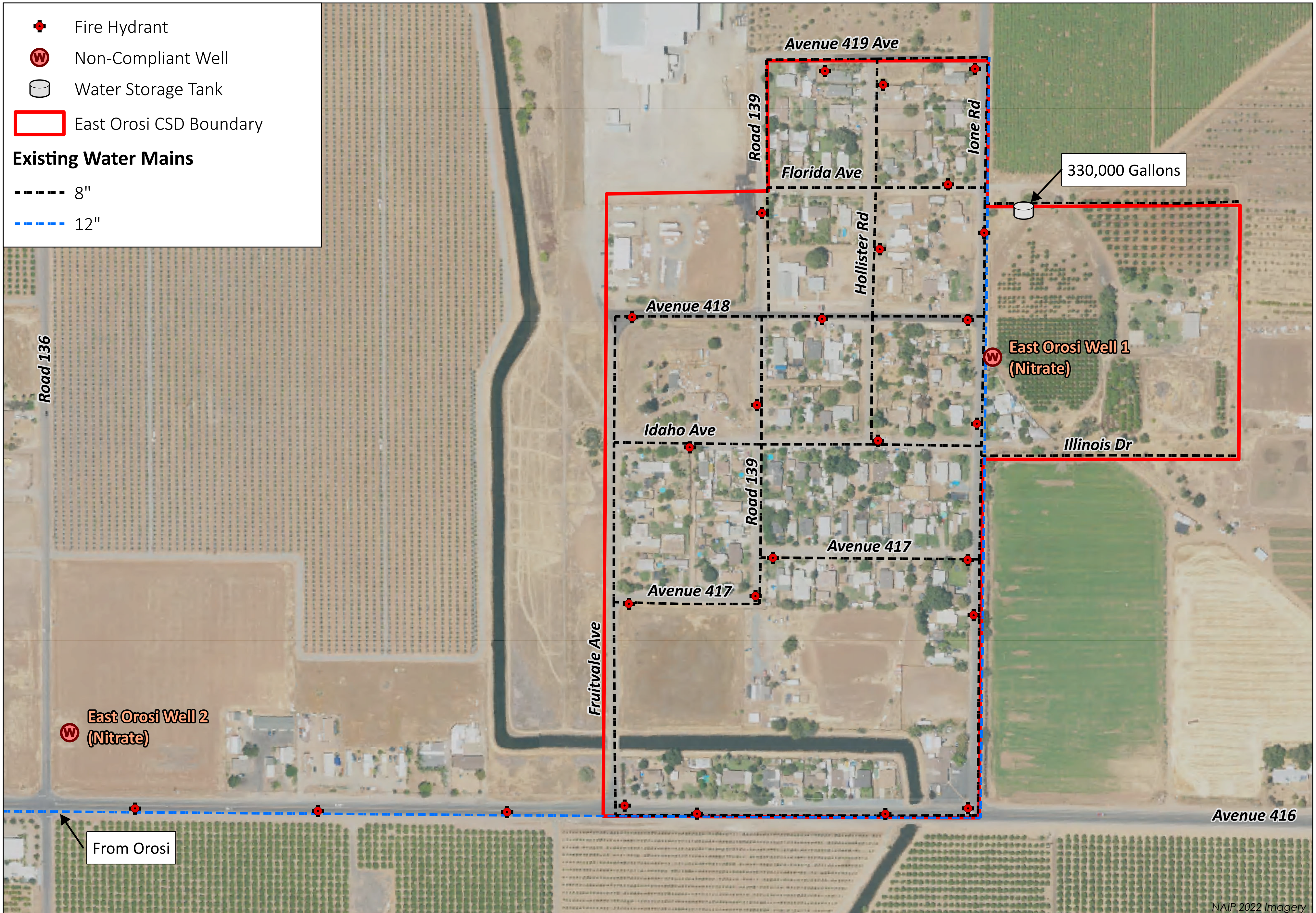

Figure 2-3: Existing East Orosi Water System

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12/17/2024 G:\CA SWRCB-4011\TA\401124009-AR7197 NE Tulare County\400 GIS\Map\NE_Tulare_County_Feasibility_Study\NE_Tulare_County_Feasibility_Study.aprx

2.4 SULTANA COMMUNITY SERVICES DISTRICT

2.4.1 COMMUNITY DESCRIPTION

2.4.1.1 SULTANA

Sultana is an unincorporated community in Tulare County, located approximately 2.5 miles east of Dinuba and 2.5 miles west of Orosi along Avenue 416. The Sultana Community Services District was formed in 1978 and provides water service to a population of approximately 779 residents through 249 metered water service connections. SCSD water system, CA5400824, consists of 239 residential connections, and ten (10) commercial connections. Not all homes within SCSD's boundaries are served water by SCSD; approximately five (5) homes rely on private groundwater wells. The most recent sanitary survey, conducted in 2024, is attached as Appendix G.

2.4.1.2 MONSON

Monson is an unincorporated community in the Tulare County, located approximately 4 miles south of Sultana along Avenue 104. The Monson water system, CA5403212, is comprised of approximately 152 residents through 31 residential service connections. In 2017, Tulare County obtained construction funding for the community of Monson to install a community well, storage tank, distribution system, and meters for the community. Tulare County also received a Legal Entity Formation Assistance (LEFA) grant to establish a governance structure that would enable SCSD to provide water through expansion of the SCSD service area boundary. Previously, the residents of Monson obtained drinking water from private wells. However, many of the wells had nitrate concentrations above standards. Also, several of the wells had gone dry due to drought. As a result, Monson faced major issues with their water supply and water quality. SCSD added Monson to their service area in 2017. The most recent domestic water supply permit 03-24-22P-012 (Revised Permit) and sanitary survey, conducted in 2022, is attached as Appendix H.

2.4.2 EXISTING FACILITIES

Water system improvements are in process (construction began in 2024) which, when completed, will result in a fully interconnected water system between the two communities and all metered connections. The two community water systems of the SCSD are connected via a 12-inch transmission main approximately 4 miles long. Both communities are completely reliant on groundwater supplies, as described below.

2.4.2.1 WATER SUPPLY SOURCES

Well SL1 was drilled in 1978, removed from service in 2005 due to nitrate contamination, and finally destroyed in 2013.

Well SL2 was drilled in the 1980s but has not been in operation since 2005 due to DBCP levels above the MCL, increasing nitrate concentrations, and poor well production. SL2 was SCSD's backup well prior to being destroyed as part of the current water system improvements.

Well SL3 was drilled in 1996 and is the primary active well. It is equipped with a 60 horsepower (hp) oil-lubricated vertical turbine pump and 5,500-gallon hydropneumatic tank. Well SL3 was drilled to a depth of 430 feet and has an annular seal to a depth of 250 feet with a 14-inch casing installed to a depth of 430 feet and perforated between 260 and 420 feet. Pump testing recorded in August of 2020 resulted in the measured flow rate of 543 GPM. SL3 is equipped with a standby engine which can provide pump power in the event of an electrical failure; however, the site does not have back up electrical power for the other systems such as the hydropneumatic tank air compressor, chlorination facilities, and controls.

Well SL4 has been constructed and start up was completed in May 2025. It is anticipated to be online by September 2025. Well SL4 is designed with 16-inch casing to a depth of 610-feet, perforations from 330 feet to 425 feet and from 485 feet to 590 feet, and an annular seal extending to 310-feet below grade. The flow rate is estimated to be 350 GPM based on pumping tests completed in November 2023.

Monson Well M1 was installed in 2017 along with the construction of a water distribution system and meters for all services. The well is equipped with a 50 hp submersible pump, a booster pump station set to pump into a 60,000-gallon bolted steel water storage tank, chlorination shed, electrical equipment, truck fill station, and storm water basin. The existing well was drilled to a depth of 1,000 feet and has an annular seal to a depth of 300 feet with a 10-inch casing installed to a depth of 990 feet perforated between 350 and 980 feet. The well produces approximately 400 GPM.

The Monson well site electrical facilities are configured to receive power from a portable generator if required during a power failure, however this requires bringing a portable generator to the site.

2.4.2.2 WATER STORAGE

The Monson system operates a 60,000-gallon water storage tank, with a booster pump station that is fed by the lone Monson supply well. The well feeds directly into the 60,000-gallon tank, while the booster pumps operate to pull water out of the tank to meet the system demands.

There is no storage within the Sultana system.

2.4.2.3 WATER TREATMENT

Sultana Well SL3 and SL4 and Monson Well M1 are actively being chlorinated at each of the well sites.

2.4.2.4 WATER DISTRIBUTION SYSTEM

SCSD has recently installed water meters to promote water conservation and apply appropriate water use charges to users within both the Monson and Sultana.

The Sultana distribution system is currently being upgraded. On completion of the current project, the system will consist of 6-inch and 8-inch PVC C900 water mains and 1-inch water services and meters. The system will include 19 fire hydrants, 2 blow-off assemblies, and approximately 4 air release valves. Figure 2-4 shows the existing distribution system for Sultana.

The Monson water system consists of 8-inch PVC C900 water mains and 1-inch water services and meters. The system includes 11 fire hydrants, and 3 blow-off assemblies. The properties that are metered are located along Monson Drive and Campbell Drive between Avenue 388 and Simpson Road. Figure 2-5 shows the existing distribution system for Monson.

A 12-inch PVC pipeline intertie between Monson and Sultana was constructed in early 2024 as part of the current project to provide a redundant water source for both the Sultana and Monson communities. This pipeline has also been equipped with a pressure-reducing valve (PRV) set to 35 PSI to prevent excess water pressure within the Monson distribution system due to the approximately 50-foot elevation difference between the communities. The pipeline is also equipped with 14 new fire hydrants, 10 air release valves, and 3 blow-off assemblies along Road 104.

2.4.2.5 SYSTEM CAPACITY

The following summary of system capacity for SCSD assumes Sultana Well SL4 meets its projected production of 350 GPM, adding this production to the existing Monson Well M1 and Sultana Well SL3.

Table 2-13 SCSD Water Supply from Groundwater Wells

COMMUNITY	SOURCE	DATE DRILLED	DEPTH	TOTAL CAPACITY
Sultana	Well SL3	1996	430	540
Sultana	Well SL4	2023	620	350
Monson	Well M1	2017	920	400
			Total	**1,290**

2.4.3 EXISTING WATER SYSTEM DEMANDS

The methodology for calculating water system demands was applied as described for previous systems. Monthly water production data for 2019 through 2022 was obtained from the eARs. Water production during the maximum month, in MG, over the last 5 years is presented below in Table 2-14.

Table 2-14 SCSD Maximum Month Water Usage Data

MAXIMUM MONTH	MONSON (MG)
September 2019	0.72
August 2020	0.62
August 2021	0.83
July 2022	0.81
2023	No Data

MAXIMUM MONTH	SULTANA (MG)
July 2019	6.22
July 2020	6.57
August 2021	7.50
July 2022	6.80
2023	No Data

The maximum months used below in calculating demands for Monson and Sultana were both August 2021.

2.4.3.1 AVERAGE DAY DEMAND

To calculate average daily usage during maximum month, divide the total water usage during the maximum month by the number of days in that month; the resulting MMADD for Monson is 0.03 MG and for Sultana is 0.24 MG.

2.4.3.2 MAXIMUM DAY DEMAND

To calculate the MDD, multiply the MMADD by a peaking factor of 1.5; the resulting MDD for Monson is 0.05 MG and for Sultana is 0.36 MG.

2.4.3.3 PEAK HOUR DEMAND

To calculate the PHD, determine the average hourly flow during MDD and multiply by a peaking factor that is a minimum of 1.5; the resulting PHD for Monson and Sultana are 57 GPM and 386 GPM, respectively.

2.4.3.4 FIRE-FLOW REQUIREMENTS

This Study assumes a minimum fire flow of 1,500 GPM for 2 hours per Table B105.1(2) will be required as described previously.

2.4.3.5 INDUSTRIAL AND COMMERCIAL USERS

The 2024 Engineering Report for the distribution system project describes Sultana water system as serving 188 connections, Monson-Sultana School, and eleven (11) commercial establishments, including two (2) gas stations, four (4) supply stores, one (1) church, one (1) tire shop, one (1) hair salon, one (1) money transfer services, and one (1) motel.

The Monson Water System includes no commercial connection or industrial connections.

2.4.3.6 WATER SYSTEM DEMANDS SUMMARY

The maximum annual demand for Monson was 7MG, in 2022, which equates to 126 GPCD. Sultana's maximum annual demand was 57MG, in 2021, which equates to 200 GPCD.

Table 2-15 Summary of SCSD Water System Demands

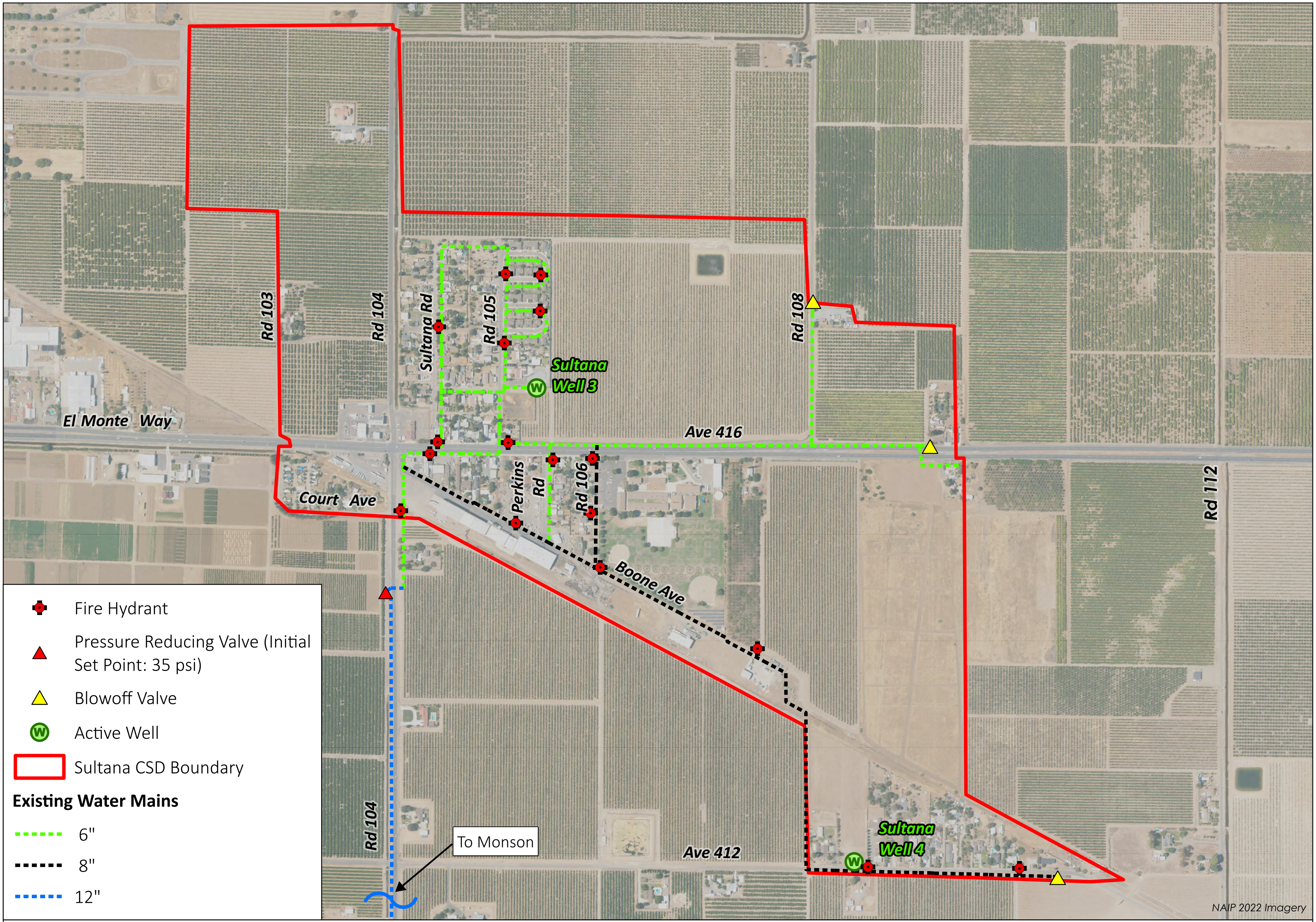
DEMAND TYPE	MONSON (GPM)	SULTANA (GPM)
MMADD	21	171
MDD	36	257
PHD	57	386
Fire Flow	1,500	1,500

The Sultana 2023 eAR reports flat rate water charges of $45.85 per single family residential connection, $91.70 per multi family connection, $65.88 per commercial connection, and $91.72 per institutional connection. Monson is operated by SCSD and reflected the same rate structure in their 2023 eAR.

Current certification for both the SCSD system operators was retrieved from (www.waterboards.ca.gov), and is shown in Table 2-16.

Table 2-16 SCSD Operator Certification

OPERATOR	CERTIFICATION No.	CERTIFICATION TYPE
Cruz Perez	39737	D1
Jose A. Padilla	25926	T2
Jose A. Padilla	27640	D1



0 500 1,000
Feet

Figure 2-4: Existing Sultana Water System

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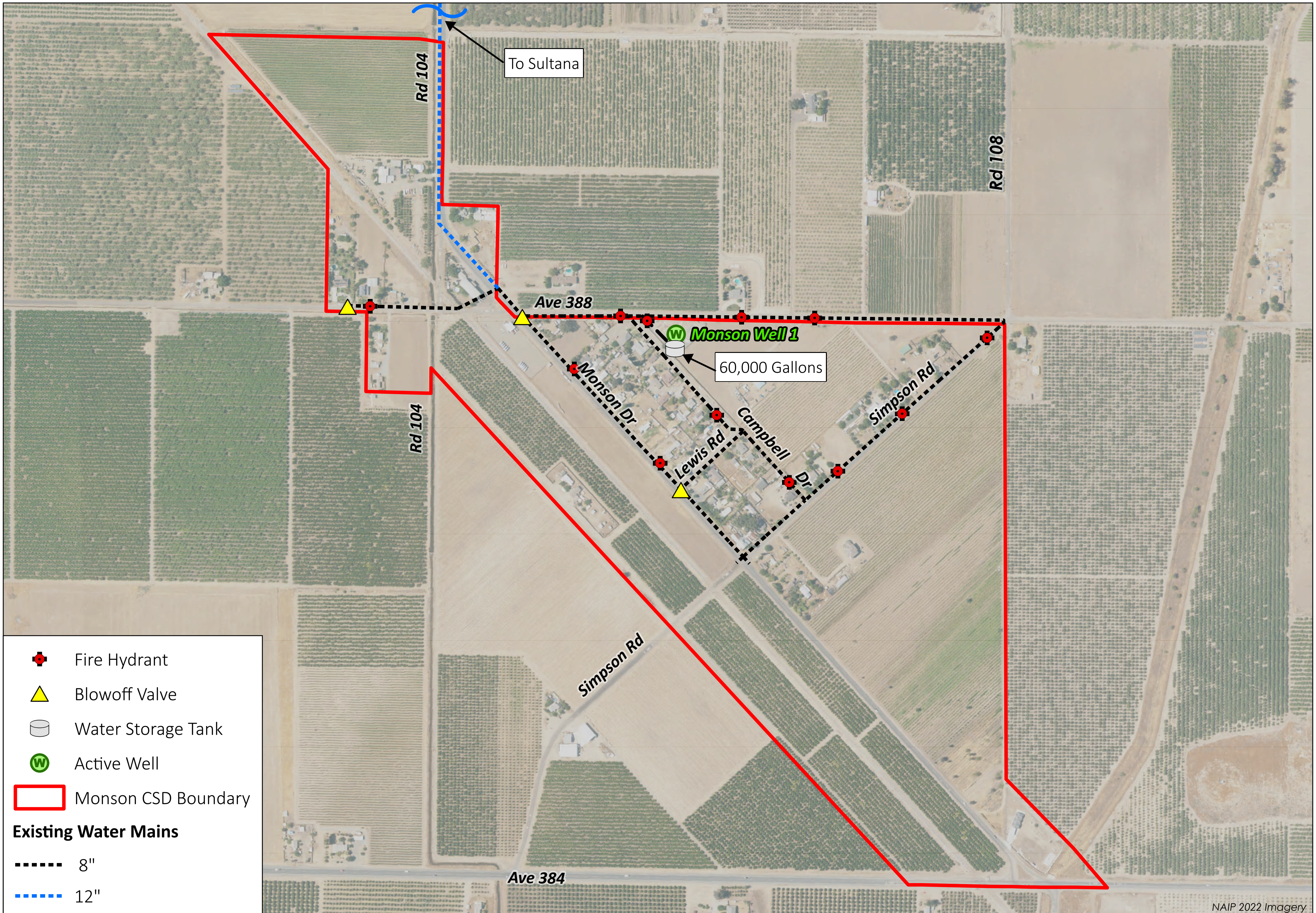

Figure 2-5: Monson Existing System Schematic

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2.5 YETTEM-SEVILLE COMMUNITY SERVICES DISTRICT

2.5.1 COMMUNITY DESCRIPTION

The communities of Yettem and Seville are located, approximately 1.5 miles apart, along Avenue 384 (SR 201). In 2009, the Seville Water Company was put into receivership, and Tulare County was named as receiver. Seville, which serves 89 residential connections, was included with Yettem, which serves 64 residential connections and 2 commercial connections, in County Service Area (CSA) #1, to be governed and administered by the County. Both communities remain part of Tulare County CSA #1, which continues to operate the wastewater collection system and lift stations. The communities recently completed the process of forming Yettem-Seville Community Services District (YSCSD) which now operates the water systems.

The Yettem and Seville water systems both face problems with nitrate levels in the source water. Additionally, the Seville water system, CA5400550, suffers water outages due to insufficient supply from the existing wells. Seville is currently receiving daily deliveries of water by trucking to supplement groundwater supplies. Approximately five (5) deliveries of 5,600 gallons each are made daily to fill the storage tank and supplement well production. An intertie with the Yettem water system, CA5403043, and new wells at both Yettem and Seville are in the planning stages. The most recent sanitary surveys, Yettem conducted in 2023, and Seville conducted in 2022, are attached as Appendix I and Appendix J.

2.5.2 EXISTING FACILITIES

The Seville water system currently consists of two wells with a booster pump array, bladder tanks, and a small, welded steel water storage tank located near the intersection of the Tulare Valley Railroad and Road 156. Water from the wells is transferred by pipeline to a larger bolted steel storage tank near the intersection of Madera Street and Road 154. A booster pump array draws water from the storage tank and pumps into the distribution system, through a hydropneumatic tank.

The Yettem water system currently consists of two wells that discharge to a bolted steel water storage tank located on the west side of Road 140. Booster pumps draw water from the storage tank and pump into the distribution system, through a hydropneumatic tank.

2.5.2.1 WATER SUPPLY SOURCES

Well SV1 was drilled to a total depth of 125 feet deep in 1960 with screenings between 60 and 80 feet bgs. Seville Well SV1 is equipped with a 7.5 hp submersible pump. The capacity was stated as 10 GPM in the 2022 Sanitary Survey, but the well is seldom used due to low production and excessive sanding.

An emergency well, Well SV2, was installed at the existing well site in 2014. This well was drilled to a total depth of 300 feet bgs with screenings between 80 and 160 feet bgs, and between 180 and 300 feet bgs. Well SV2 is equipped with a 10 hp submersible pump. Based on correspondence with County staff, this pump was replaced in 2017 and was set to a working depth of 285 feet bgs. The well capacity is described as having 100 GPM in the 2022 Sanitary Survey. However, the operator reported that the two active Seville wells only produce 15 GPM between them. The daily water deliveries supplement the well production to meet demands.

An additional emergency well, designated as Well SV3, had been designed, and was under construction in fall of 2024. Well SV3 is located at the Seville tank site and was planned to discharge directly into the 211,000-gallon bolted storage tank. Initial pump tests and water quality testing indicated low production of marginal quality in November 2024, and it was determined that a well at this site was not viable.

Well Y1 is approximately 340 feet deep and is equipped with a 5 hp vertical turbine pump. County staff indicated that the well capacity is approximately 50 GPM. There is a flowmeter on the discharge. The well is located at the Yettem tank site and the pump discharges directly into the 150,000-gallon water storage tank.

Well Y2 is approximately 330 feet deep and is equipped with a 5 hp submersible pump. County staff indicated that the well capacity is approximately 70 GPM. There is a flowmeter on the discharge. Under normal operations, Well Y2 discharges into the water storage tank located at the Well Y1 site via a 3-inch water main located off of Road 140. Existing valves and piping configuration allow for Well Y2 to discharge directly into the water system.

The Well Y2 Motor Control Center (MCC) is hardwired to the Well Y1 MCC (via buried telemetry cable running between the sites). The MCCs at each site are equipped with cell phone dialers for alarms.

A proposed Well Y3 is planned as part of Phase II of current YSCSD water system improvement project. It has been proposed that the remaining funding from Well SL3 will be used to drill a test well for Well Y3.

2.5.2.2 WATER STORAGE

Both of Seville's existing wells are located on the same site, and discharge to a 12,300-gallon water storage tank at the well site. Booster pumps transfer the water from the well site to the 211,000-gallon storage tank and booster pump array near the intersection of Madera Street and Road 154.

Two 15 hp horizontal end suction centrifugal pumps draw water from the Seville storage tank and pump to a 5,000-gallon hydropneumatic tank. A 50 hp horizontal split case centrifugal pump is also available to fill the hydropneumatic tank and is primarily used for fire flow capacity. The hydropneumatic tank pressure settings maintain a distribution system pressure of 35 to 55 PSI.

Water produced by the two existing Yettem wells is blended in a 150,000-gallon storage tank located at the Well Y1 site to maintain a water supply below the nitrate MCL of 10 mg/L.

A 10 hp vertical Inline booster pump draws water from the Yettem storage tank and pumps into a 5,000-gallon hydropneumatic tank. A 25 hp canned vertical turbine pump is available to fill the hydropneumatic tank and is primarily used for fire flow capacity. The hydropneumatic tank pressure settings maintain a distribution system pressure of 35 to 55 PSI.

2.5.2.3 WATER TREATMENT

Both systems have chlorination facilities to maintain a residual in the respective storage tanks. The Seville system automatically adds chlorine to the Well SV2 fill line into the 12,300-gallon tank at the well site. The chlorination facilities at the 211,000-gallon tank site are unused. Well SV1 is not routinely chlorinated.

The Yettem system automatically adds chlorine at the Well Y1 fill line discharging to the 150,000-gallon tank. Yettem Well Y2 is not routinely chlorinated.

Well Y3 is planned to discharge directly to the 150,000-gallon Yettem storage tank, similarly to Well Y2.

Nitrate blending treatment of water produced by the two existing Yettem wells occurs in the 150,000-gallon storage tank. The controls signal Wells Y1 and Y2 to fill the tank simultaneously when the water level in the tank reaches 19 feet. Well Y1 is signaled to turn off when the water level reaches 19.75 feet, but Well Y2 continues to fill the tank until the water level in the tank reaches 21 feet.

2.5.2.4 WATER DISTRIBUTION SYSTEM

The Yettem water system was constructed in 1995. The distribution system is constructed with 6-inch PVC water mains and 1-inch connections predominantly located in front yards. There are some residential water meters, but they have not been utilized for metered water usage charges. According to County staff, properties were initially required to connect to the water system but those having private wells were required to have a backflow prevention device installed on their water service as a precaution against cross-connection. It is not known whether private wells on these properties were ever destroyed in accordance with State requirements.

The failing distribution system in Seville was abandoned in place and replaced with new 8-inch water mains within County right-of-way (ROW) during Phase I construction in 2020. Water meters were installed at all water service connections. Fire hydrants, isolations valves, blow-offs, and sampling stations were installed throughout the system in accordance with County standards.

An interconnecting pipeline to provide redundancy for both systems is proposed as part of Phase II, the construction of which will help resolve several water issues in each community. Construction of Phase II is expected to be completed in 2027.

2.5.2.5 SYSTEM CAPACITY

The following summary of system capacity for YSCSD assumes all components of Phase II are completed, including the additional wells and interconnecting pipeline.

Table 2-17 YSCSD Water Supply from Groundwater Wells

COMMUNITY	SOURCE	DATE DRILLED	DEPTH	TOTAL CAPACITY (GPM)	NOTES
Yettem	Well Y1	1994	340	50	Blended
Yettem	Well Y2	1994	330	70	Blended
Yettem	Well Y3	Planned			
Seville	Well SV1	1960	125	0	To be abandoned
Seville	Well SV2	2014	300	15	
Seville	Well SV3	2024		0	Not developed
			Total	135	

It is planned to abandon Well SV1 upon completion of Phase II of the current improvement project. Well SV3 was under construction as an emergency well to relieve Well SV2, with the expectation they would alternate production to allow groundwater levels to recover. Long term, the Yettem wells are expected to be the primary source of water for YSCSD, with the interconnecting pipeline serving Seville from Yettem.

2.5.3 EXISTING WATER SYSTEM DEMANDS

CCR Title 22 describes the process for estimating the MMADD for a system based on the month with the highest water usage during the most recent ten years of operation or, if the system has been operating for less than ten years, during its period of operation. Monthly water production data for 2019 through 2022 was obtained from the eAR. The wells are the sole source of water for each system, in the absence of metered usage data, the demand is assumed to equal production. The maximum months for Yettem and Seville have consistently been June or July. Water production during the maximum month, over the last 5 years is presented below in Table 2-18 .

Table 2-18 YSCSD Maximum Month Water Usage Data

MAXIMUM MONTH	YETTEM (MG)
July 2019	2.04
2020	Not Used
July 2021	2.33
July 2022	2.12
2023	No Data

MAXIMUM MONTH	SEVILLE (MG)
June 2019	3.15
2020	Not Used
June 2021	2.66
July 2022	2.10
August 2023	2.06

Reporting for 2020 is inconsistent with the data received for other years. Both systems reported consistent monthly water usage a fraction of 2019 and 2021 years that did not exhibit the expected annual curve. Data from 2020 was therefore not used.

The maximum months used below in calculating demands for Yettem and Seville were July 2021 and June 2019, respectively.

2.5.3.1 AVERAGE DAY DEMAND

To calculate average daily usage during maximum month, divide the total water usage during the maximum month by the number of days in that month; the resulting MMADD for Yettem is 0.08 MG and for Seville is 0.10 MG.

2.5.3.2 MAXIMUM DAY DEMAND

To calculate the MDD, multiply the MMADD by a peaking factor of 1.5; the resulting MDD for Yettem is 0.11 MG and for Seville is 0.15 MG.

2.5.3.3 PEAK HOUR DEMAND

To calculate the PHD, determine the average hourly flow during MDD and multiply by a peaking factor that is a minimum of 1.5; the resulting PHD for Yettem and Seville are 121 GPM and 164 GPM, respectively.

2.5.3.4 FIRE-FLOW REQUIREMENTS

This Study assumes the minimum fire flow of 1,500 GPM for 2 hours per Table B105.1(2) will be required.

2.5.3.5 INDUSTRIAL AND COMMERCIAL USERS

SDWIS indicates that Yettem serves 2 commercial connections. There are no commercial connections for Seville.

2.5.3.6 WATER SYSTEM DEMANDS SUMMARY

The maximum annual demand for Yettem was 17 MG, in 2022, which equates to 133 GPCD. Seville's maximum annual demand was 25 MG, in 2023, which equates to 99 GPCD.

Table 2-19 Summary of Seville-Yettem CSD Water System Demands

DEMAND TYPE	YETTEM (GPM)	SEVILLE (GPM)
MMADD	57	71
MDD	86	107
PHD	129	164
Fire Flow	1,500	1,500

The 2023 eAR for Yettem reports a single flat rate residential water charge of $82.80 per connection. The Seville 2023 eAR reports base rate water charges of $58.90 per residential connection, $166.95 per commercial connection, and $58.90 per institutional connection with a cost per 1,000-gallon unit of measure of $1.50.

The YSCSD system is operated by the same operators as the SCSD system, and their current certification is repeated below in Table 2-20.

Table 2-20 YSCSD Operator Certification

OPERATOR	CERTIFICATION No.	CERTIFICATION TYPE
Cruz Perez	39737	D1
Jose A. Padilla	25926	T2
Jose A. Padilla	27640	D1

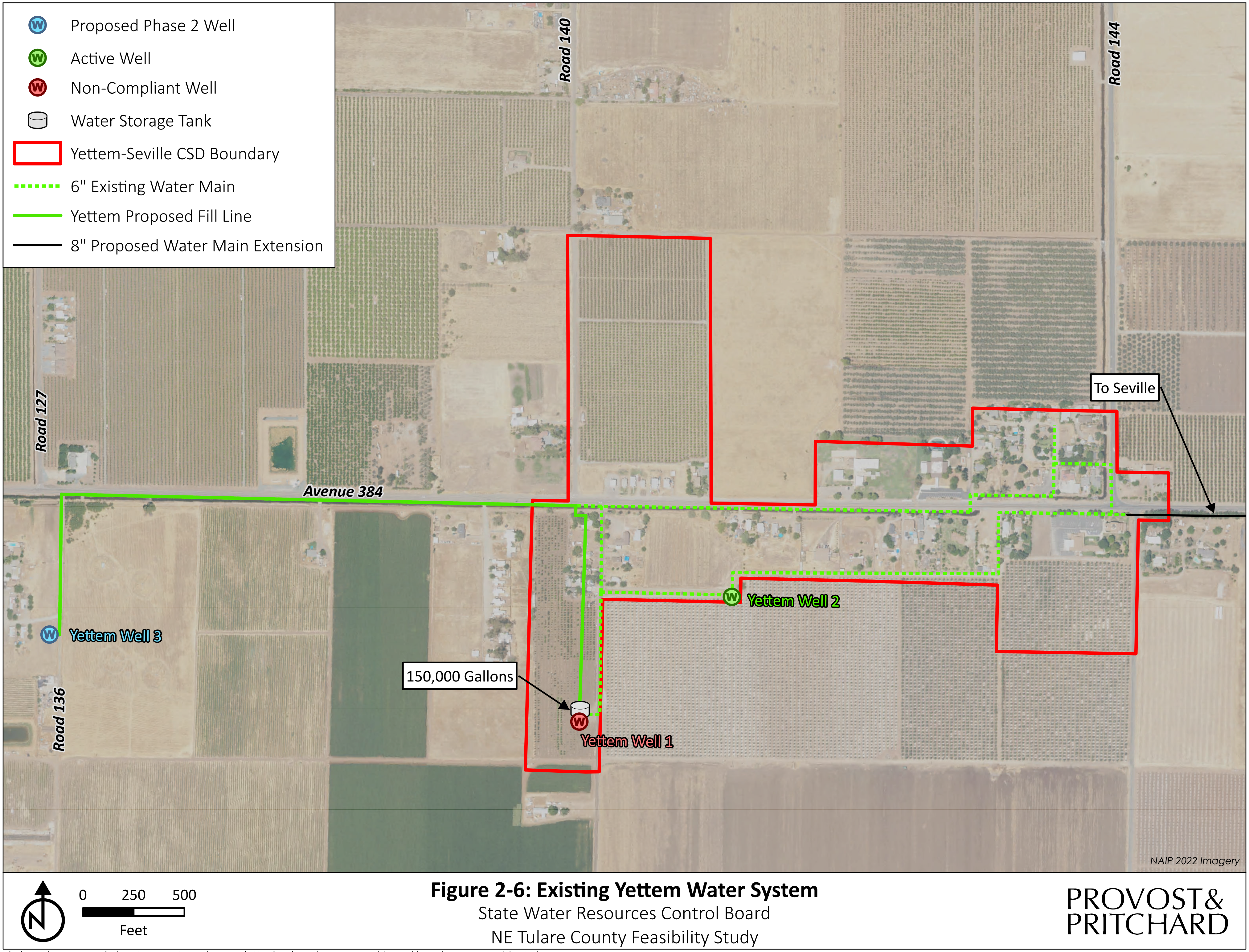

Figure 2-6: Existing Yettem Water System

State Water Resources Control Board

NE Tulare County Feasibility Study

PROVOST & PRITCHARD

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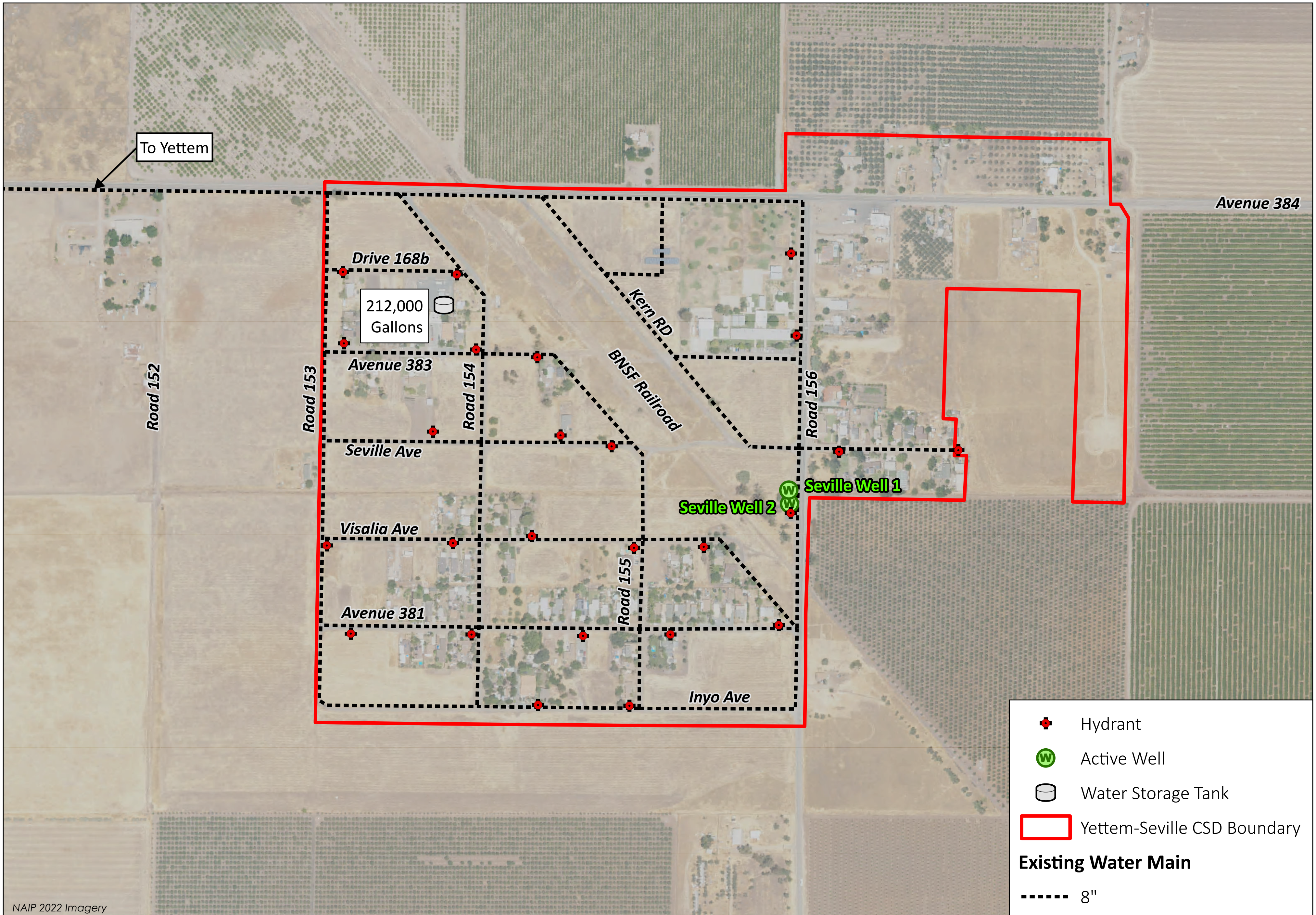


Figure 2-7: Existing Seville Water System

State Water Resources Control Board

NE Tulare County Feasibility Study

PROVOST & PRITCHARD

3 PROBLEM DESCRIPTION

As discussed in the previous sections, this region has a long history of projects to overcome challenges of operating water systems individually. Recent and ongoing projects have provided more reliability and resiliency for the individual water systems; however, vulnerabilities remain to the long-term sustainability of the individually operated systems. This Study is intended to identify long-term reliable and sustainable water supply solutions that may be viable for a regional project, to support the water supply needs of all the communities in Northeast Tulare County.

3.1 WATER SUPPLY AND DEMAND

The following tabulation of total water supply for the Northeast Tulare County area includes active sources meeting drinking water standards. Well numbers in this table have been prefixed to identify the community system. This table excludes any wells that have existing compliance orders for MCL violations.

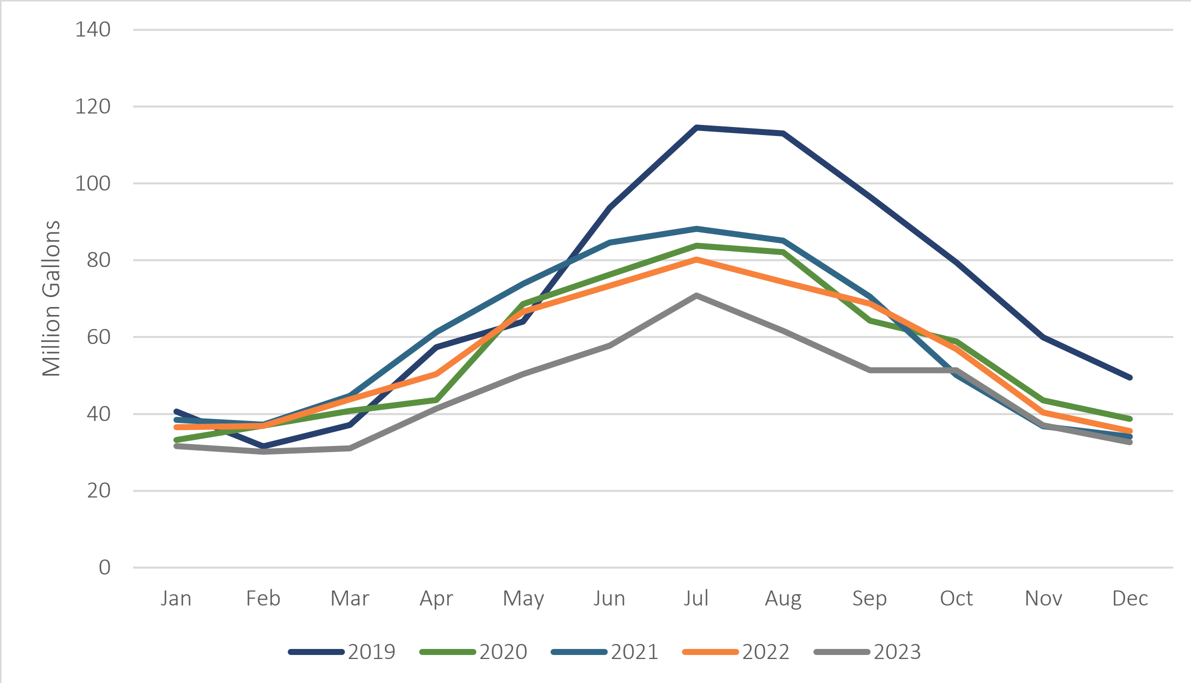
Table 3-1 Existing Regional Groundwater Supply Wells

DISTRICT/ COMMUNITY	SOURCE	DATE DRILLED	DEPTH	TOTAL CAPACITY (GPM)	NOTES
CPUD	Well C9	2007	515	300	
OPUD	Well O4	1966	425	525	
OPUD	Well O5A	1990	433	525	
OPUD	Well O8	1996	455	700	
OPUD	Well O10	2006	496	800	
Sultana	Well SL3	1996	430	540	
Sultana	Well SL4	2023	620	350	
Monson	Well M1	2017	920	400	
Yettem	Well Y1	1994	340	50	Blended
Yettem	Well Y2	1994	330	70	Blended
Seville	Well SV2	2014	300	15	
Current Total Supply Capacity				4,275	
Firm Source Capacity with largest source offline				**3,475**	

Demands calculated in the previous section rely on the process of identifying the maximum month, dividing by the number of days in that month to produce the MMADD and subsequently applying the 1.5 factors for MDD and PHD as described in Title 22 for systems with monthly usage data. It follows that the demands for the entire system could be derived by the summation of the MMADDs, MDDs, and PHDs for the individual systems, however this would result in an inflated demand as the maximum months for each system, although generally occurring in summer, occur in different years and different months.

Figure 3-1 below shows the summation of water demands used to determine the maximum month for the Northeast Tulare County area as a whole. The 2023 production data is lacking for some systems, and OPUD 2019 production data seems to have been excessive compared to subsequent years. The 2020, 2021, and 2022 production data appear consistent and produce a maximum month of 88.2 MG occurring in July of 2021.

Figure 3-1 Northeast Tulare County Region Total Demands



Dividing the maximum month of 88.2 MG by the number of days in that month to produce the MMADD and subsequently applying the 1.5 factors for MDD and PHD as described in Title 22 for systems with monthly usage data results in the region wide demands shown in Table 3-2.

Table 3-2 Summary of Regional NTC Water System Demands

DEMAND TYPE	RESULT (GPM)
MMADD	2,100
MDD	3,150
PHD	4,725
Fire Flow	1,500

The current total supply capacity of the regional wells with the largest source offline, 3,475 GPM (Table 3-1), is adequate to meet MDD of 3,150 GPM.

As required by Title 22, a system with 1,000 or more service connections shall be able to meet four hours of PHD with source capacity, storage capacity or emergency interconnections. While the PHD of 4,725 GPM cannot be met by the current firm supply of 3,475 GPM, the total water storage between all seven communities is 1.62 MG, which provides capacity to meet 4 hours of PHD. Additionally, various improvements described above in current projects would potentially increase the total groundwater supply in the region to meet the regional demand per Title 22. The East Orosi Consolidation Project will add an additional 330,000 gallons of storage.

The following sources of supply listed in Table 3-3 are either existing sources planned to be treated by blending, or planned new groundwater sources that are currently funded and under construction, and not included in the existing capacity totals shown in Table 3-1. If all projects are completed as planned, the revised firm capacity of the combined supply sources is sufficient to meet the 4-hour PHD requirements of Title 22.

Table 3-3 Planned Regional Groundwater Supply

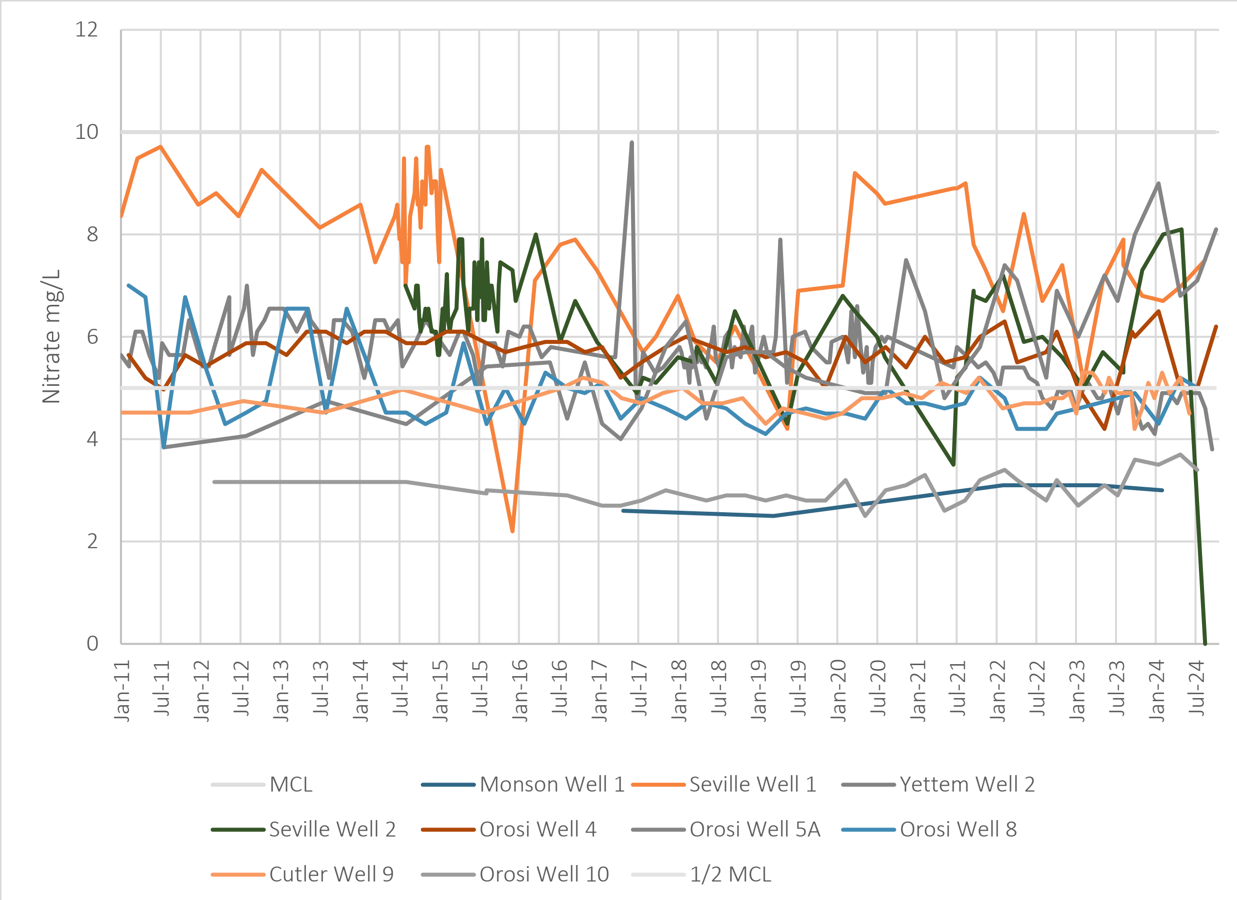
DISTRICT/ COMMUNITY	SOURCE	DATE DRILLED	DEPTH	PLANNED CAPACITY	NOTES
CPUD	Well C6	1979	497	750	Blending with C10 expected completion 2027
CPUD	Well C10	2016	440	750	Expected Completion 2027
EOCSD	Well E3	2025		1,200	Expected Completion 2027
Yettem	Well Y3	Planned		149	Expected Completion 2027
Planned Total Supply Capacity (including existing sources)				7,124	
Firm Source Capacity with largest source* offline				**5,624**	
*With Well C10 offline Well C6 cannot be blended, resulting in the combined 1,500 GPM from both wells being considered the largest source.					

3.2 WATER QUALITY

Water quality monitoring requirements for each system are described in the most recent sanitary surveys and water quality data are reported on SDWIS and Groundwater Ambient Monitoring Assessment (GAMA) Program. The water systems are required to monitor their active groundwater sources for general mineral (GM), general physical (GP), and inorganic (IO) chemical water quality every three years, except for nitrate which has a different monitoring frequency. The sanitary survey report by DDW notes East Orosi Well E1 exceeds the secondary MCLs for the following constituents: iron, manganese, and turbidity. A new East Orosi well is in the planning phase as part of the Orosi/East Orosi Consolidation Project. The remaining wells in the area show results are below the respective GM, GP and IO MCLs except Nitrate, DBCP, and TCP which are discussed further below, and are non-detect (ND) for volatile organic compounds (VOCs). Gross Alpha monitoring for radiological contaminants, are on 9- and 6-year cycles for the various wells. A summary table of groundwater quality data for each well is presented in Appendix K.

The individual water systems are required to monitor active groundwater sources for nitrate (as N) annually if monitoring data indicates nitrate concentrations of less than one-half the MCL of 10 mg/L, and quarterly if the concentrations are greater than or equal to one-half the MCL. Multiple sources within the communities produce water with nitrate concentrations greater than 5 mg/L and are on a quarterly monitoring frequency. Several sources have exceeded the nitrate MCL and are either inactive or subject to compliance orders. Nitrate levels in those active sources that remain below the MCL are shown in Figure 3-2. All but two sources, Well M1 and Well O10 are consistently at or above ½ the MCL for nitrate. Excluding all the wells that have exceeded or currently exceed the MCL for nitrate significantly restricts the available water supply. Well Y1 is currently in use through blending operations with well Y2 to lower the nitrate concentrations supplied to the distribution system. Well C6 is planned to be blended with Well C10, which is yet to be equipped.

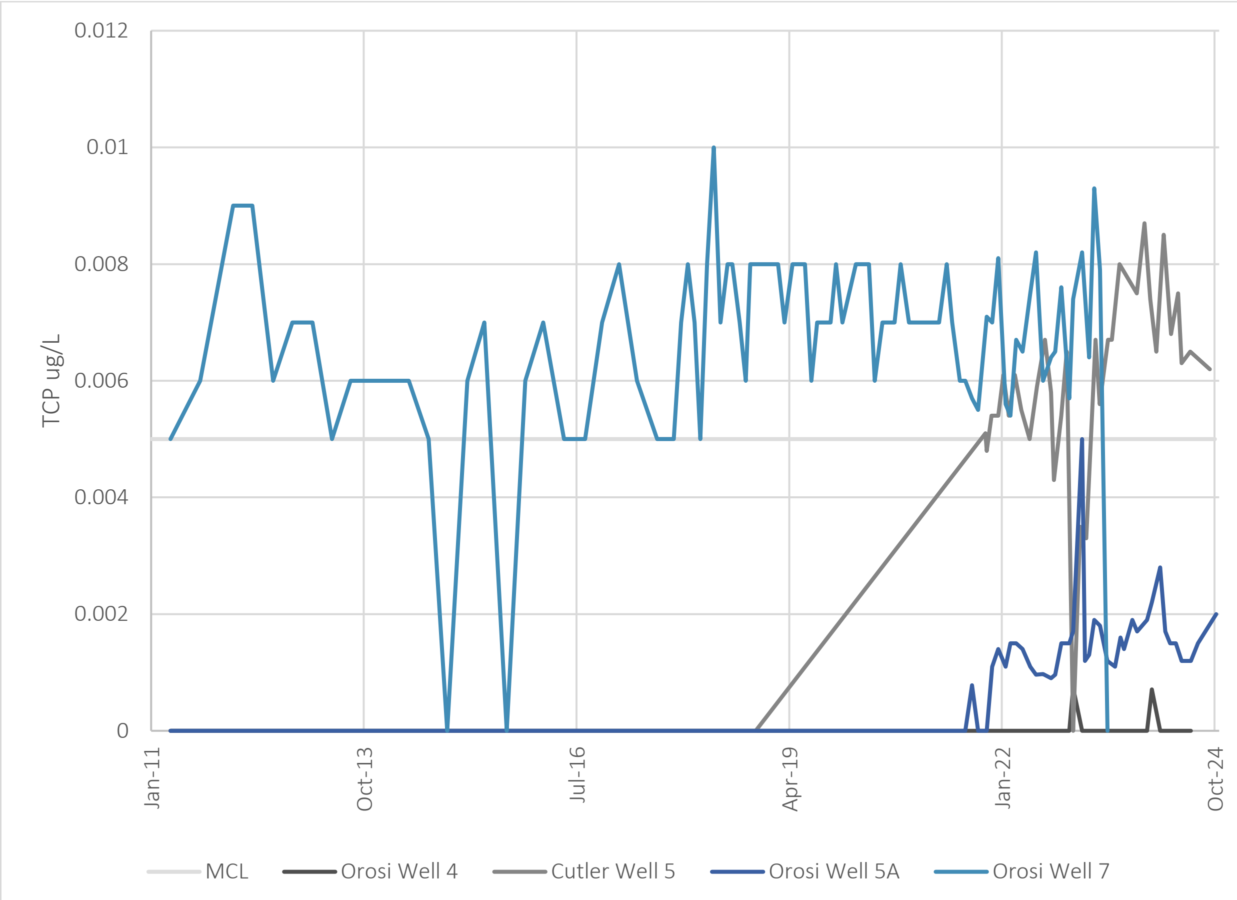
Figure 3-2 Nitrate Levels in Groundwater Sources



Wells SV1 and SV2 are consistently over half the nitrate MCL, but to date have reported no exceedances of the MCL. Groundwater levels in Well SV1 and its history of pumping sand excludes it from consideration as a viable source in the long term. The emergency Well SV3, proposed to replace Well SV1, produced poor initial testing results in terms of both production and water quality so it will be excluded from further discussion. Both Wells E1 and E2, Well SL2, Well C5, and Well O7 have a history of exceeding the MCL but no means of treatment or blending.

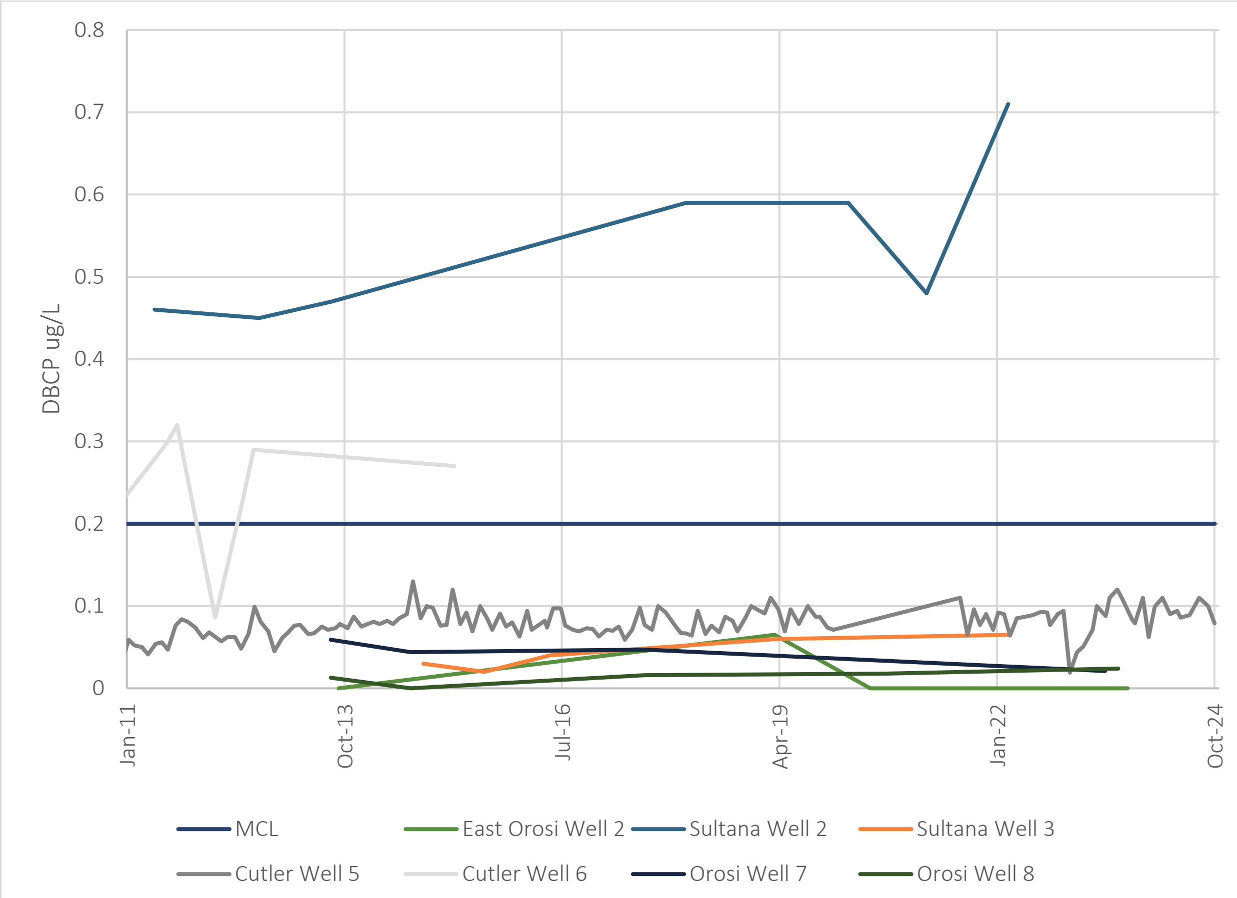
TCP has been detected in Well C5, and Wells O4, O5A and O7, which are shown below in Figure 3-3. Well O7 is offline due to both nitrate and TCP exceeding the MCL of 0.005 ug/l.

Figure 3-3 TCP Levels in Groundwater Sources



The wells shown below in Figure 3-4 have detected levels of DBCP. Well C6 and SL2 are inactive due to both sources containing DBCP at levels above the MCL of 0.2 ug/l. Well SL2 is to be destroyed on completion of the SCSD project.

Figure 3-4 DBCP Levels in Groundwater Sources



3.3 SENATE BILL 552

Senate Bill No. 552 (SB 552) was approved by the Governor of California on September 23, 2021. The bill requires certain drought resiliency measures of all "small water suppliers"[1] . The following list presents several questions that provide insight into the community's ability to meet those requirements. It should be noted that a fully consolidated single water system serving all 7 communities would no longer be a small water system as it would total 3,373 connections, exceeding the 2,999-service connection definition of a small water system.

- Is the system able to ensure continuous operations during power failures with adequate backup electrical power supply? <u>Partially</u>
    - CPUD: The 2022 Sanitary survey reports backup power generation is available for CPUD. Well C6 has back-up power and Well C9 does not; the new Well C10 and Blending tank facilities will include a generator.
    - OPUD: Wells O4 and Well O5A do not; Wells O8 and O10 have on-site diesel-powered emergency auxiliary power generators.
    - EOCSD: Wells E1 and Well E2 do not; and the draft construction plans for Well E3 do not include backup power generation.
    - SCSD – Sultana: Well SL3 is equipped with an LPG standby engine to provide power to the well and Well SL4 is equipped with an on-site emergency auxiliary power generator.
    - SCSD – Monson: Monson Well M1 has the means to connect a portable generator in the event of a power failure.
    - Yettem: Wells Y1 and Y2 do not; the new Yettem Well Y3 design includes a backup generator.
    - Seville: Wells SV1 and SV2 do not; backup power is available at Seville Well SV3 in the form of a portable generator.

- Does the system have at least one backup source of water supply, or a water system intertie, which meets current water quality requirements and is sufficient to meet average daily demand? <u>Not at present, but projects are in process to fulfill this requirement.</u>
    - The projects to interconnect CPUD – OPUD and OPUD – EOCSD provide water system interties capable of meeting MMADD. The new well drilled for EOCSD within the OPUD service area and equipping of CPUD's Well C10 blending tank provides additional supply.
    - The project to physically interconnect Monson – Sultana provides an intertie such that each is capable of meeting the other systems demands. Monson is able to store its MDD. Sultana has a standby well that does not meet water quality standards, and no storage so will rely solely on the Monson Intertie.
    - The project to physically interconnect Yettem and Seville provides an intertie such that Yettem is capable of meeting Seville's system demands. Given the Seville well production even with the emergency well is expected to be less than Seville's MMADD, the Yettem intertie should be considered Seville's sole source. Seville's backup source is primarily the 211,000-gallon tank, with some minimal production from its 2 wells.

- Has the system metered each service connection, and does it monitor for water loss due to leakages? <u>Partially</u>
    - OPUD and Seville water systems are metered.

[1] Pursuant to the Water Code, a "small water supplier" is defined as any community water system serving 15 to 2,999 service connections, inclusive, and that provides less than 3,000 acre-feet of water annually.

  - CPUD has installed meters on about 20 service connections and is expected to complete the remainder as a condition of the potential consolidation project with OPUD.
  - Metering of Yettem is included in phase 2 of the Yettem-Seville project.
  - Metering of Monson-Sultana is included in the Sultana CSD project.
  - The EOCSD water system is metered, but meters are reportedly not functioning and not used for billing. The EOCSD project includes replacement of the distribution system and meters.

- Does the system have source system capacity, treatment system capacity if necessary, and distribution system capacity to meet fire flow requirements?
  - The fire flow requirement for the region as a whole is assumed to be 1,500 GPM for 2 hours, based on the most restrictive requirements identified in individual Communities, although they have not been confirmed by Tulare County.
  - It is assumed that CPUD and OPUD, once connected, will be able to meet fire flow demand of 1,500 GPM for 2 hours with the combination of storage and production capacity from both CPUD and OPUD wells. Distribution system modeling has not been completed, and it would be required to confirm available fire flows with any degree of certainty.
  - The existing well production of East Orosi, Monson and Sultana and lack of storage for fire flow indicate they cannot meet the minimum 1,500 GPM for 2 hours required for unincorporated areas by County of Tulare's adoption of the California Fire Code assumed in this Study. A lower fire flow requirement of 500 GPM at 20 PSI was used in the design and modeling of Monson and Sultana based on Tulare County requirements. Tulare County similarly provided QK a reduced fire flow requirement for EOCSD indicating 1,000 GPM at 1 hour would be "minimally acceptable".
  - The design criteria for Yettem and Seville included 1,500 GPM fire flow for 2 hours at a residual pressure of 20 PSI. The Seville water system can also meet the 1,500 GPM for 2 hours requirement from its 211,000-gallon tank and booster station. The Yettem system is expected to meet fire flow by a combination of water from the 211,000-gallon Seville Tank and booster pumps via the interconnecting 8-inch pipeline and the 150,000-gallon Yettem tank.

3.4 AFFORDABILITY AND SUSTAINABILITY

Five of the seven systems charge flat water rates with no usage-related fees. The two systems charging a Unit of Measure (UOM) based cost on top of the base rate are Orosi and Seville, at $0.96 and $1.50 per 1,000-gallons, respectively. The majority of users are residential customers, so this section focuses primarily on the residential rates.

DDW requests each system approximate drinking water charges based on consumption of 6, 9, 12, and 24 hundred cubic feet (HCF) per month in the systems eAR. This approximates to 150, 225, 300 and 600 gallons per day (GPD) per household. The average per capita water usage in the region is 137 GPCD, which is comparable with Tulare County design standards of 150 GPCD for new developments.

Figure 3-5 Existing Residential Water Rates

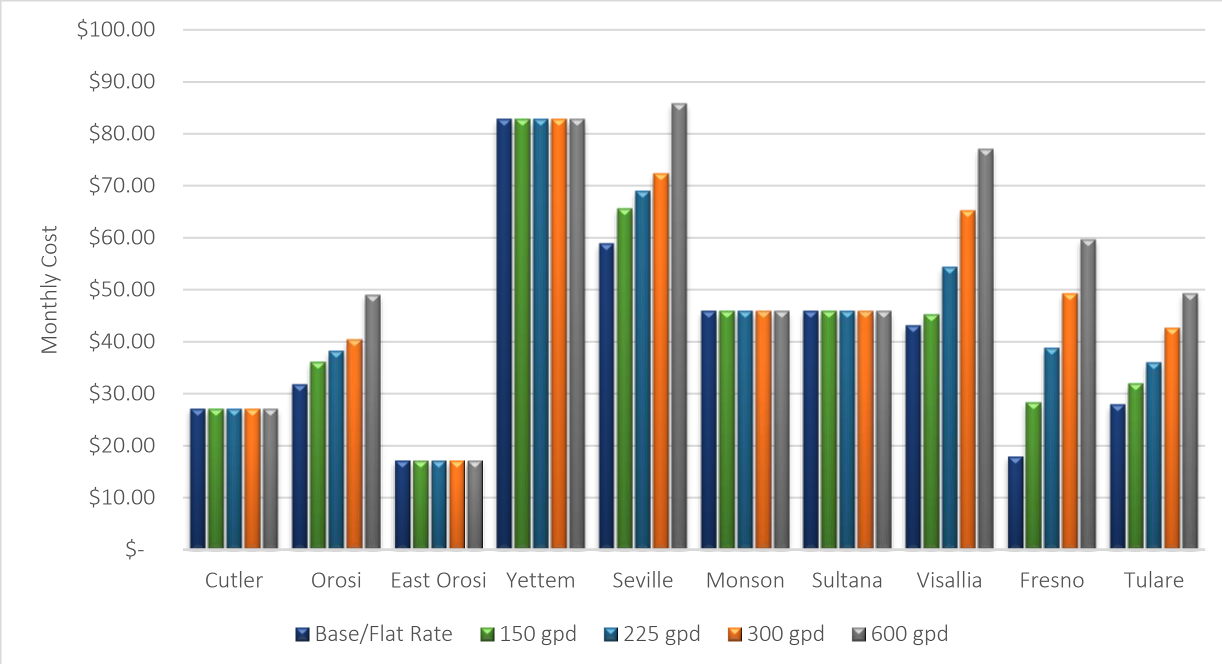


Figure 3-5 shows household water costs based on 150 GPD, 225 GPD, 300 GPD, and 600 GPD, which correspond to approximately 6, 9, 12, and 24 HCF per month. At the upper end of 600 GPD, Yettem and Seville range between $83 and $86 per month. Monson-Sultana has a newly metered system resulting from grant funded projects but have not yet established commensurate UOM rates and remain at $45.85 flat rate, approximately in line with a 600 GPD household in Orosi at $49.01. It should be noted that CPUD and EOCSD, with respective rates of $27.10 and $17.15, are both systems that are considered failing by DDW and in the process of consolidations originated by the SWRCB. The water rates for the cities of Visalia, Tulare, and Fresno, using the same usage assumptions and 1-inch meter, are provided for comparison, as larger systems with a wider base of rate payers over which to spread operational costs.

The affordability index measures the burden of costs passed from the water utility to the users. Affordability is generally considered to be 1.5% to 2% of MHI for 6 HCF (150 GPD) per month. Table 3-4 shows current rates based on 150 GPD, compared to MHI. An affordability index less than 1.5% may impact the approval of grant funding. Rates approaching 2.5% of MHI can be considered unaffordable.

Table 3-4 Existing Rate Affordability

DISTRICT/COMMUNITY	MHI	150 GPD (6HCF/MONTH)	% OF MHI
Cutler PUD	$58,692	$27.10	0.55%
Orosi PUD	$52,692	$38.24	0.87%
East Orosi Community Services District	$33,472	$17.15	0.61%
Monson Water System	$49,750	$45.85	1.11%
Sultana Community Services District	$38,125	$45.85	1.44%
Yettem Water System	$42,500	$82.80	2.34%
Seville Water Company	$39,500	$65.63	1.99%

4 PRIOR STUDIES AND REPORTS

4.1 BRIEF HISTORY

Beginning around 2014, the County, Alta Irrigation District (AID), and communities in the NTC area worked to form a JPA to pursue a regional surface water project. AID decided they did not need to be a member of the JPA and could enter into water supply agreements with the JPA, once formed.

In 2014, the County and the communities embarked on forming a JPA with assistance from Rural Community Assistance Corporation (RCAC), funded through a Legal Entity Formation Assistance grant from SWRCB. After three years of collaboration and negotiations (and many iterations and revisions) CPUD and OPUD left the effort and formed their own JPA, the Cutler-Orosi Surface Water Project Authority (COSWPA).

In 2015, an updated feasibility study was completed for the regional surface water project.

In 2017, the County (representing Monson and property owners outside of an established district), East Orosi, Sultana, Yettem, and Seville formed a JPA, the Northern Tulare County Regional Water Alliance (NTCRWA). The goal was to pursue funding for a regional surface water project which would provide water to communities in Northeastern Tulare County. In 2019, the State Board terminated the project stating it was too expensive for the number of connections potentially included. Since that time, the JPA has not been active.

In 2020, the COSWPA reached out to the County requesting participation in their effort to secure funding for the surface water treatment project. The County entered into an MOU with the COSWPA, Appendix L, on behalf of Yettem and Seville, and residents along the pipeline route outside of a district. Sultana CSD and Monson did not participate in this MOU.

Through the 2015 effort, the SWRCB had identified several pieces of the project that needed to be resolved. These are the subject of this Study, as outlined in Section 1.1 to include analysis of water rights, treatment plant capacity, unit process design, distribution water quality concerns, disinfection strategy, operator requirements and expertise, system hydraulics, potential for conjunctive use of groundwater and surface water, and strategy for uninterrupted service during canal maintenance, as well as governance and financial analysis.

4.2 PREVIOUS STUDIES

4.2.1 WATER SUPPLY STUDY CUTLER-OROSI AREA

In 2007, AID, CPUD, and OPUD commissioned the preparation of a study to evaluate options for providing potable drinking water to Cutler and Orosi (Dennis R. Keller/ James H. Wegley, 2007). The recommendations of that study were to proceed with development of a treated surface water supply to provide a long-term drinking water supply to Cutler and Orosi.

Currently, all urban water uses in the NTC area are supplied from groundwater wells. The study aimed to address a concern regarding the long-term viability of the existing groundwater supply. These concerns were a result of declining groundwater quality, including increased occurrence of nitrates and DBCP.

4.2.2 NORTH TULARE COUNTY REGIONAL SURFACE WATER TREATMENT PLANT STUDY

The North Tulare County Regional Surface Water Treatment Plant Study (NTCRSWTPS) was prepared by Keller-Wegley Engineering. A draft of the NTCRSWTPS was submitted to DDW in October 2014. The study was funded through DWSRF.

The NTCRSWTPS was intended to serve the following seven communities:

- Cutler Public Utility District
- Orosi Public Utility District
- Sultana Community Services District
- East Orosi Community Services District
- Seville (Zone of Benefit CSA No. 1)
- Yettem (Zone of Benefit CSA No. 1)
- Monson Area

A Final Report was completed in February 2015, and an addendum prepared in September 2015 (Dennis R. Keller / James H. Wegley, 2015).

DDW commented on the draft NTCRSWTPS supporting development of surface water as a drinking water source of supply but noted that there were many compliant groundwater sources in the communities and that a long-term solution is likely to include both surface water and groundwater. DDW was also concerned, based on the explanation of the firm supply, on the availability of surface water as a reliable drinking water source of supply.

Comments were also provided by Community Water Center and Self-Help Enterprises echoing the DDW comments regarding a lack of understanding of the "firm supply" and what level of commitment AID would be able to provide to supply surface water, concerns over the increased costs of purchasing and treating surface water, and lack of analysis of groundwater supplies in the greater region, outside an undefined "Cutler Orosi Area". The most prevalent questions in both letters related to the increased O&M costs and resulting costs per connection, notably the way the allocation of costs to the smaller communities resulted in a significantly higher per connection cost than could be achieved by spreading the project cost across the region.

4.2.3 COMMUNITY WATER CENTER PUBLIC OUTREACH EFFORTS

At the meeting of the Board of Directors of the Northern Tulare County Regional Water Alliance held on April 11, 2018, CWC was approved to carry out a public scoping process for identifying alternatives to be considered by consultants for the Alternatives Analysis as the first step in planning of shared drinking water projects. The final Scoping Report was submitted to NTCRWA in August 2018.

The approved plan consisted of meetings with a "focus group" of engaged residents, followed by a first round of three community meetings, and concluding with a larger regional public meeting. The objectives of these meetings were to re-engage residents in the project, providing information on local groundwater quality conditions, an update on the formation of the NTCRWA, and discussion of the pros and cons of the project alternatives, and ways community residents could stay informed and involved in the process.

For this scoping effort, CWC conducted outreach to the seven NTC communities, as well as the cities of Orange Cove and Dinuba. At these engagements, the potential pros and cons of different water sources were discussed, including surface water, groundwater, wellhead treatment, groundwater blending, or a combination of surface and groundwater. Qualitative discussions were facilitated to explore potential interest in different solutions without conducting quantitative analysis. In 2018, Dinuba was focused on local groundwater recharge and remediation of groundwater quality and was not interested in surface water. Orange Cove expressed interest in a potential intertie with a regional system to provide groundwater as a back-up to their surface water supply.

5 WATER SUPPLY ALTERNATIVES

5.1 REGIONAL GROUNDWATER SUPPLY

This section examines the existing regional groundwater supply, discussing subsurface hydrogeologic conditions, the potential to drill new municipal wells when existing wells reach the end of their working life, and the viability of treatment options should groundwater quality in currently compliant wells fall out of compliance with drinking water standards.

5.1.1.1 SUBSURFACE HYDROGEOLOGIC CONDITIONS

Page and LeBlanc (1969) and Croft and Gordon (1968) describe the geology, hydrology, and water quality of the Fresno Area and Hanford-Visalia Area. The NTC project area, particularly Yettem-Seville at the southeast of the project area, lies on the border between the two hydrogeologic study areas. Site specific hydrogeologic evaluations have been completed by Kenneth D. Schmitt and Associates (KDSA) for multiple water systems in the area for P&P including Monson, Sultana, Yettem, and Seville, and for QK relating to the new East Orosi well and for Cutler and Orosi. Extensive work by both KDSA and P&P has been conducted developing data and analyzing the larger region as part of Kings Subbasin Sustainable Groundwater Management Act (SGMA) coordination efforts. These reports provide information on subsurface geologic conditions within the area. Groundwater condition reports, and a copy of the East Orosi Test well memo, are included in Appendix N.

The area is bounded to the east by the foothills of the Sierra Nevada, Stokes Mountain, and a significant inlier of consolidated rock, Smith Mountain, is located northwest of Sultana. Page and LeBlanc (1969) describe a basement complex consisting of consolidated rocks of pre-Tertiary age which crops out along the eastern border of the area and yield only small amounts of water to wells. Page and LeBlanc (1969) divide the overlying unconsolidated deposits into an older series of Tertiary and Quaternary age, and a younger series of Quaternary age.

The depth to the basement complex in the area increases from northeast to southwest as it is overlain by increasing depths of alluvium from the "compound alluvial fan of intermittent streams south of the Kings River" and the "Interfan area of Cottonwood Creek", as described in Page and LeBlanc (1969). The Quaternary Older Alluvium deposits overlie the older Tertiary-Quaternary continental deposits. These Tertiary-Quaternary continental deposits which occur at greater depths are generally much finer grained than the overlying deposits, and clay layers are often present. Although not as extensive as the regional confining bed of Corcoran Clay which lies west of Highway 99 well beyond the study area, less continuous, but important, local confining beds have been identified in the region since the 1960s as wells have progressed deeper into these layers in search of water. Figure 5-1 shows the location of the Geomorphic units and Geologic deposits described as they relate to the communities and topographic features of the landscape.

The aquifer above these clay layers, which exist near the base of the Quaternary older alluvium or in the upper part of the underlying continental deposits, is generally defined as unconfined shallow groundwater in which KDSA notes concentrations of nitrate, TCP, and DBCP tend to be higher. This groundwater, above an average depth of approximately 250 feet across the Kings Sub basin, is generally indicated to be younger than about 70 years old, while water below the confining beds is less, or minimally, affected by irrigation practices.

Within the project area, several wells have been drilled in recent years by tapping deeper portions of the aquifer below these confining layers, producing water meeting drinking water quality standards. Sultana

Well SL4 was drilled in 2023 to a depth of 620 feet and has an annular seal to a depth of 310 feet with a 16-inch casing installed to a depth of 610 feet and perforated between 330 and 425 feet and between 425 and 590 feet and produces 350 GPM. Monson Well M1 was drilled in 2017 to a depth of 1,000 feet and has an annular seal to a depth of 300 feet with a 10-inch casing installed to a depth of 990 feet perforated between 350 and 980 feet and produces approximately 400 GPM. Page and LeBlanc (1969) notes that deep wells almost always had lower yield factors than shallower wells when comparisons were made using wells of similar construction and penetrating similar material.

KDSA identifies three important issues as being depth to the top of the hard rock, depth to the top of the reduced (blue green) deposits and whether salty groundwater is present at depth. The depth to base of unconfined groundwater, depth to bed rock is shown in Figure 5-2. In deeper groundwater, the most common constituents of concern are manganese, arsenic, and possibly iron. The origin of the blue green deposits is described in Page and LeBlanc (1969) and Croft and Gordon (1968). Unconsolidated deposits of Tertiary and Quaternary age and those of Quaternary age were laid down in either an oxidizing or a reducing environment. According to R. H. Meade (1967, p. C6-C7) and Davis and others (1959, p. 58-59) oxidized deposits are red, yellow, or brown, indicating subaerial deposition; and reduced deposits are blue, green, or gray, indicating they were probably deposited in a deltaic or flood-plain environment. The blue or green micaceous, fine to medium sand, silt, and clay, layers contain little or no gravel. The significance of these reduced deposits, per KDSA, is that the groundwater in them may be unusable for public water supply without treatment. The test well for the proposed East Orosi well, located between Cutler and Orosi, was completed to a depth of 590 feet, encountering the blue-green deposits between 391 and 421 feet. KDSA subsequently recommended to QK that the annular seal of a new well should be installed to a depth of 230 with casing installed to a depth of 590 feet and perforated between 255 and 390 feet and between 430 and 570 feet. Pump-efficiency tests cited by Croft and Gordon (1968) suggest that the reduced older alluvium is moderately permeable and wells less than 500 feet in depth generally yield 200 to 1,500 GPM. The Water Quality table prepared by KDSA for the East Orosi well indicates elevated EC, TDS, and manganese at 394-400 feet within the blue or gray-green deposits present from 391-421 feet and at 572 to 577 feet.

Should it be necessary in future to develop additional groundwater supply wells, the exploration of the areas west of Cutler and Orosi and south of Sultana, excluding the immediate vicinity of the existing wastewater plant, can be considered. Selection of test well locations and supply well recommendations would be prepared on a case-by-case basis working directly with a professional hydrologist and assessing the vulnerability of sites to possible contaminating activities. Figure 5-3 highlights existing well locations in the area.

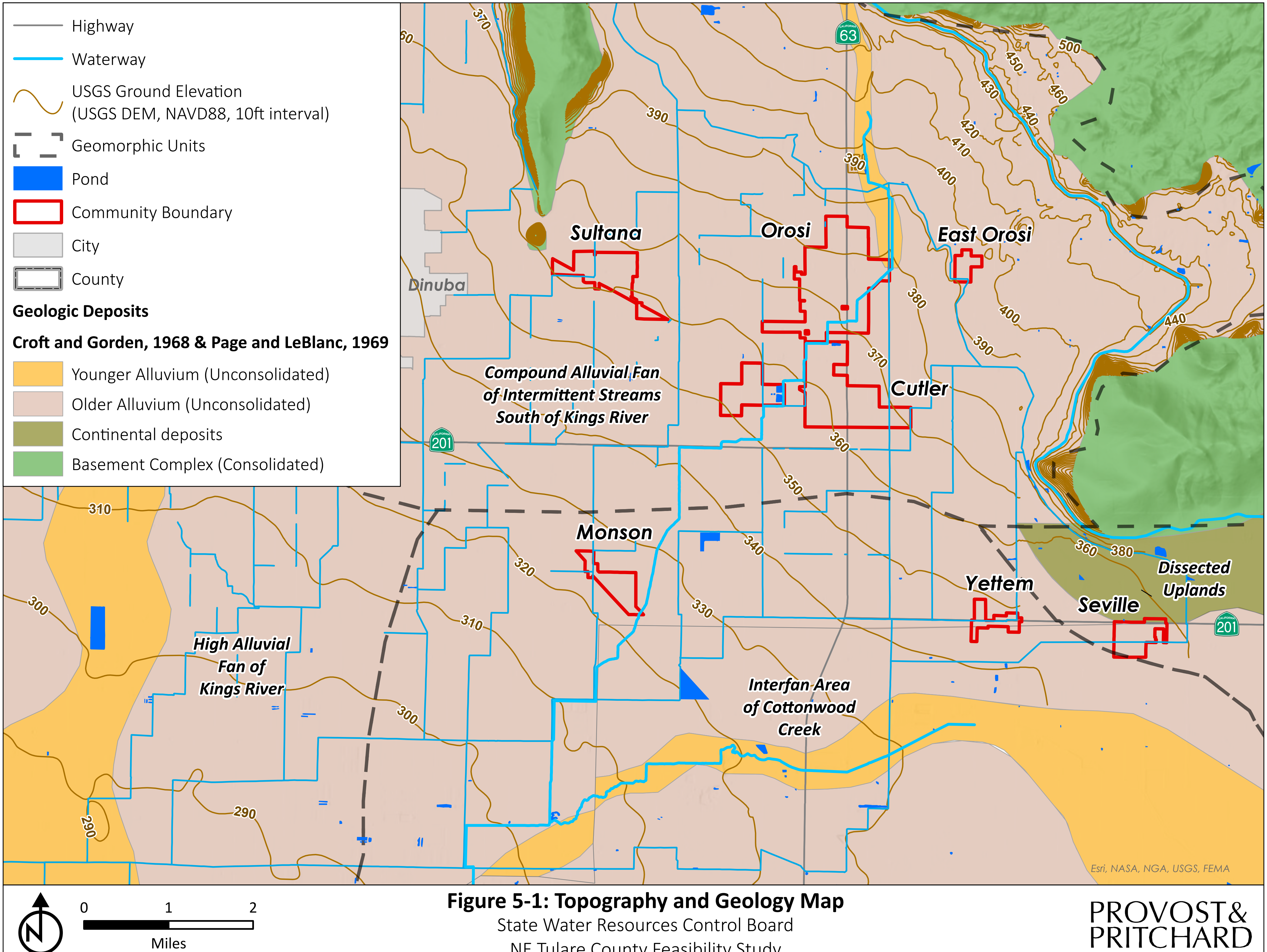


Figure 5-1: Topography and Geology Map

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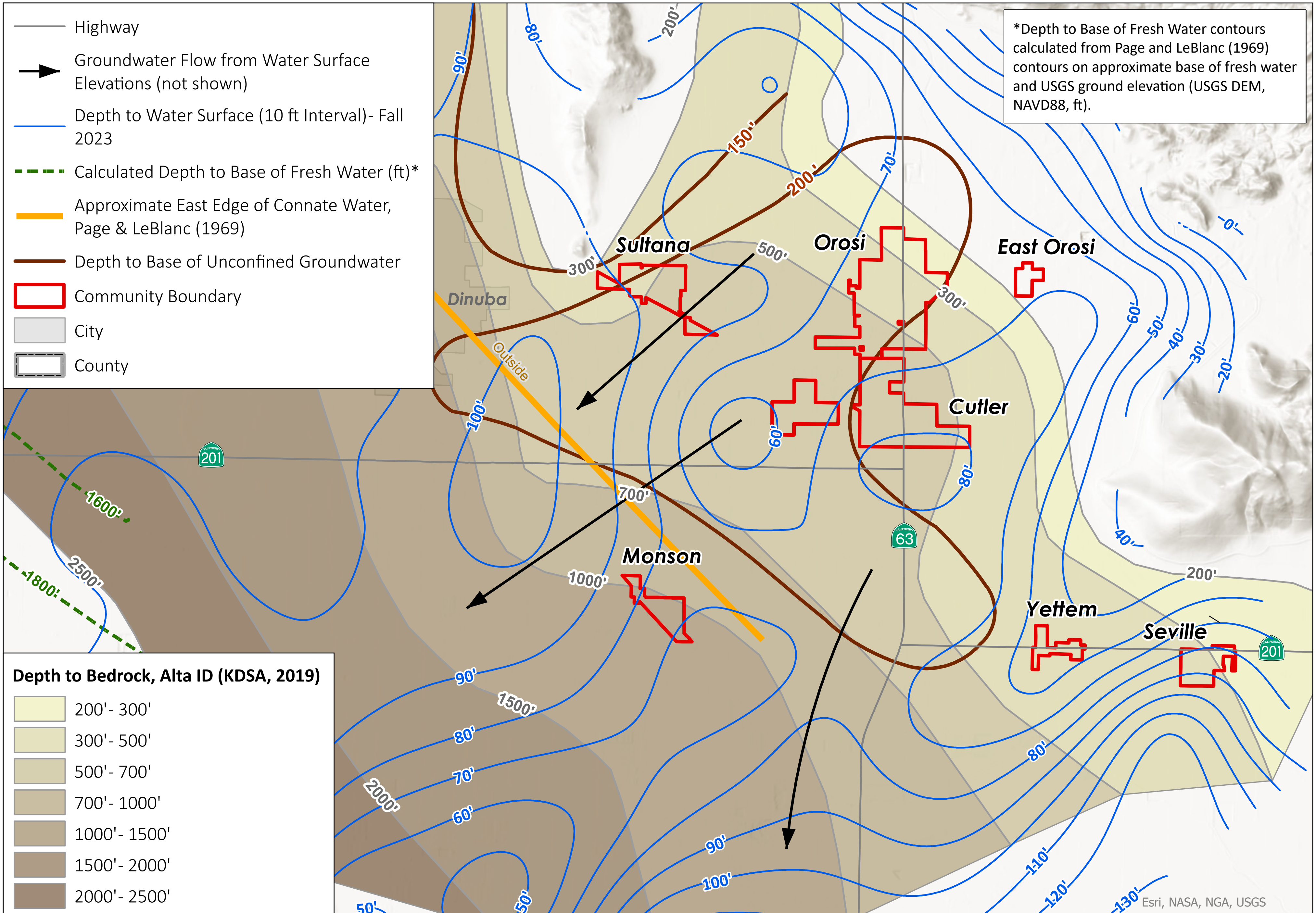

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Figure 5-2: Groundwater Map

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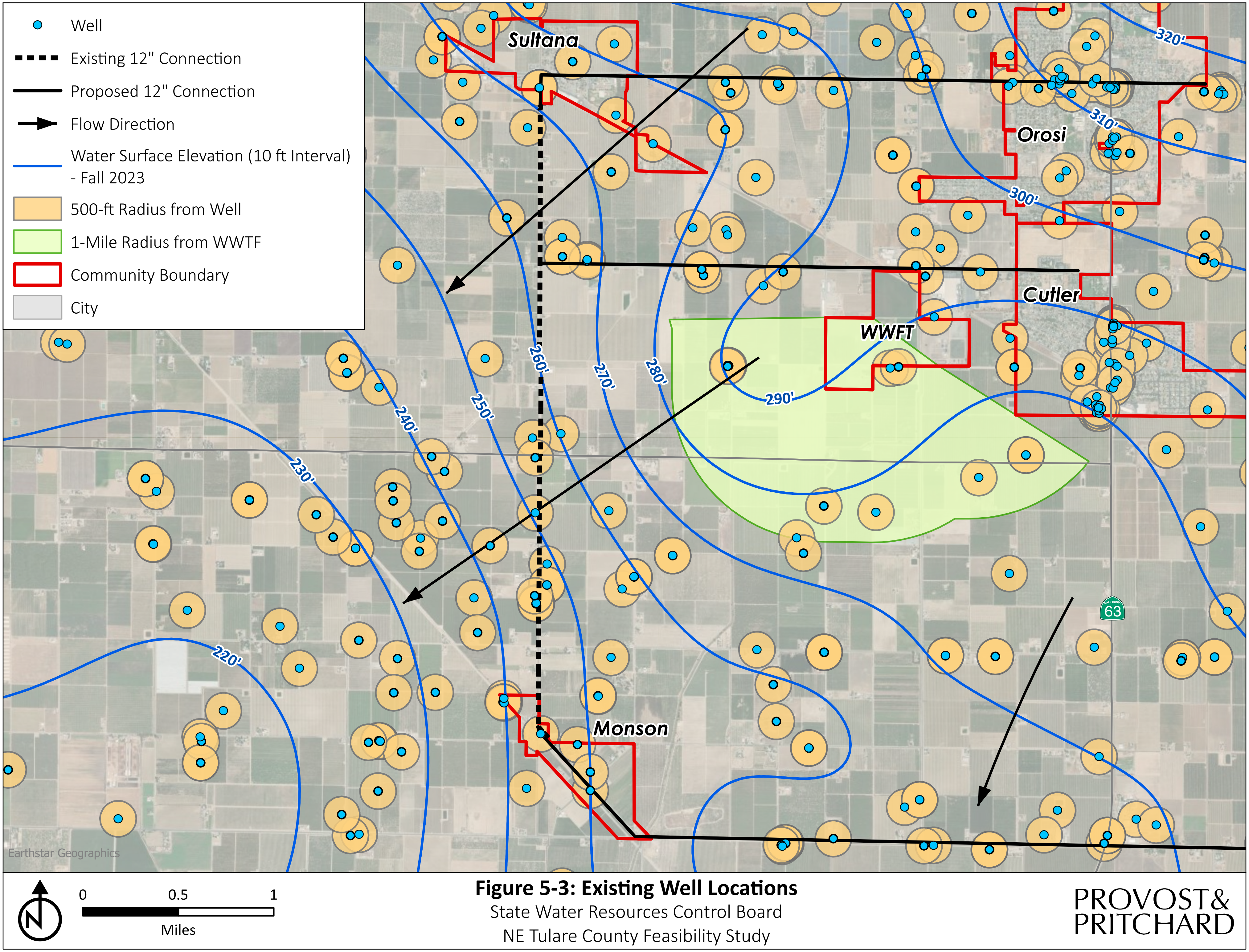

Figure 5-3: Existing Well Locations

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5.1.1.2 TREATMENT

Sealing off the upper layers of the aquifer, which are affected by agricultural practices, can be expected to limit the need for treatment. Based on the wells described above, sealing wells to approximately 300 feet and tapping the lower strata to depths ranging from 600 feet to 1,000 feet dependent on depth to bedrock, and avoiding the blue green deposits, has proven to produce reliable yields of at least 350 GPM of water meeting drinking water quality standards without treatment.

The opposite approach would be constructing wells in areas known to produce water with high nitrate concentrations and likely to also produce water containing TCP and DBCP above the MCL. This would mean installing wells to tap the shallower unconfined groundwater above 300 feet. The best available technology (BAT) for removal of TCP and DBCP is Granular Activated Carbon (GAC) and has been successfully implemented at numerous wellhead treatment projects throughout the Central Valley.

The BATs for the treatment of nitrates are ion exchange (IX) or reverse osmosis (RO). As discussed in the 2007 report by Keller/Wegley, and supported by more recent projects for nitrate removal, IX would be the appropriate treatment method for consideration. P&P prepared a PER in October 2024 for the City of Lindsay, to analyze the feasibility of treating their Well 11. The project would bring them closer to meeting their MDD with groundwater during periods that the Friant Kern Canal (FKC) is down for maintenance. The selected project would treat 630 GPM of the 1,400 GPM flow from the well. The total capital cost for that project, which included pretreatment for perchlorate, was estimated at $5,943,000, with O&M Cost of $1.89/1,000 gallons (City of Lindsay Well 11 Preliminary Engineering Report, 2024). Assuming half the MDD in the NTC study area requires treatment, the capital costs, for treatment alone, would likely exceed $18,000,000 and additional annual O&M costs to treat 865 MG/year and dispose of brine waste exceeding $1,650,000 annually.

Piping from existing active wells, which do not currently require nitrate treatment, would add further capital costs above the costs of constructing a centralized treatment site. The drilling of new wells at the treatment site to specifically target shallow groundwater with high concentrations of nitrate would likely be preferable to installing new piping for untreated water through the communities from existing aging wells. Of the two highest producing wells with known nitrate contamination, Cutler Wells C5 and C6, Well C5 is reported to be in a state of disrepair and rehabilitation unfeasible. Land requirements for evaporation ponds to concentrate the spent brine would be an additional concern which would increase the area required. The City of Lindsay PER contemplated 1.5 acres of double-lined ponds. A conservative estimate would place the requirements for the NTC region demands at 4.5 acres. Given the number of unknowns in predicting which, if any, existing wells would potentially require treatment, and what other constituents may be present, a treatment approach will not be considered further.

5.2 SURFACE WATER SUPPLY

There are two local sources of surface water that can be considered for this area. The first is from the Kings River where storage is provided by Pine Flat Dam, which was constructed by the Corps of Engineers. The second is the San Joaquin River where storage is provided by Friant Dam impounding at Millerton Lake. Friant Dam was constructed by the Bureau of Reclamation. Friant Dam and Millerton Lake are part of the Central Valley Project (CVP). Conveyance of surface water supplies south of the San Joaquin River is by the Friant-Kern Canal to the federal contractors. Both dams are federally constructed projects. Alta Irrigation District is located to the east of the Kings River and is a member of the Kings River Water Association (see Figure 5-4). AID has rights to diversion of surface water from the Kings River based upon a schedule agreed to by the association members and overseen by a Watermaster that reports to the SWRCB. The communities described previously are all within AID, apart from East Orosi which is within the Orange Cove Irrigation District, and within the place of use of the CVP. Under the license(s) with the State of California, the Kings River water can be used for irrigation and in some limited cases for incidental municipal use.

Water sourced from the Kings River would be subject to the following constraints to be overcome in the development of a source of supply for municipal use:

- AID's surface water supplies under the Kings River Licenses are for agricultural use. One license does include domestic use for a specific location.
- Conveyance by the FKC would require pumping of water from AID facilities into the FKC.
- AID delivers water during the irrigation season.
- Place of use restrictions for communities outside AID's boundaries would need to be overcome.
- Zero delivery years due to hydrology have occurred historically in 2015 and 2021.

Water sourced from the CVP (Class 1) water would be subject to the following constraints to be overcome in the development of a source of supply for municipal use:

- Place of use, primarily within AID's boundaries, is outside the areas served by Friant Water Authority (FWA) members.
- Zero delivery years for Class 1 water have occurred historically in 2014 and 2015.

To implement the construction and operation of a surface water treatment alternative there must be the ability to deliver an adequate, dependable, and safe supply of surface water. Kings River water must be diverted from existing points of diversion under the State license, and there are no diversion points within close proximity to the project area. Considering a new point of diversion from the Kings River potentially in Reedley, or west of Dinuba, and pumping raw water would significantly increase the costs of a potential project, requiring a pump station located on the river, and additional pipeline. Therefore, only existing conveyances can realistically be considered. The FKC, which is largely concrete lined in the vicinity of the project area, is within reasonable proximity to the planned project and upgradient of the communities, allowing for gravity flow from the canal to potential surface water treatment plant (SWTP) locations. The FKC runs approximately 152 miles from the town of Friant to the Kern River in Bakersfield and is located along the eastern edge of the project area. The Friant Water Authority, through contract with the United States Bureau of Reclamation (USBR), is responsible for the operation and maintenance of the FKC. The Friant Water Authority manages delivery of the San Joaquin River water supply via the FKC, on behalf of the Friant Division Contractors of the Federal Central Valley Project. To date, it is understood that conversations have been with the AID to provide the surface water supplies. Other CVP districts could also be an option.

For an agreement to be developed with AID, the restrictions identified above would need to be overcome. The most significant of these are conveyance and delivery of the supply which are thought to occur through use of the Friant-Kern Canal and ability to store water through multiple dry years. It has been presumed that a Warren Act agreement could be obtained from the USBR, but absent other deliveries in the canal all the time a small amount of surface water would enter the large canal and there are some considerations about trying to convey 3 to 5 cubic feet per second (cfs) of flow through a canal capable of 3,000 cfs.

Since the proposed SWTP would receive water from the FKC, a water supply agreement that provides for diversion from the FKC will be required. This could be accomplished by an agreement directly with an entity with an FKC supply, or an agreement with AID (or other Kings River entity) to convey Kings River water that is exchanged and diverted into the FKC. There are specific limitations and requirements for such an exchange that would require additional evaluation.

At the time the NTCRSWTPS was prepared, (Dennis R. Keller / James H. Wegley, 2015), AID had consistently diverted and delivered surface water to lands within AID. Since that report was prepared, AID has experienced two water years with no diversions. The first event occurred in 2015 and the second took place six years later in 2021. In addition, CVP allocations for Friant Class 1 water were zero in 2014 and 2015. Critical-High and Critical-Low years within the neighboring San Joaquin watershed, the source of FKC water, are identified in 1976 and 1977, 2014 and 2015, and 2021. Considering these drought years and in anticipation that water in such critically dry years could be anticipated to reach costs of upwards of $1,500 per AF. As reported by SJV Water, a nonprofit news site dedicated to covering water in the San Joaquin Valley, surface water was being sold at $970 per acre-foot in 2015 and 2016.

CVP surface water supply is not dependable during drought years as allocations of CVP Class 1 water can be significantly curtailed and can be reduced to 0%. The City of Lindsay is in the process of adding nitrate treatment to one of their wells and intends to drill three new wells to ensure demands can be met when their 2,500 AF allocation is curtailed in dry years. The City of Orange Cove inactivated all groundwater sources from 2003 to 2004, and the City's sole source of supply is surface water. Orange Cove has a water contract with USBR allocating 1,400 AF per year. To provide for future growth, Orange Cove entered a long-term FKC water transfer agreement with the Lower Tule Irrigation District for an additional 2,000 AF of water. The City of Orange Cove has local storage ponds which store only 30 days of water supply, and the City is under a compliance order related to source capacity (03 23 17R).

The 2,500 AF surface water supply cited in the 2015 Keller-Wegley report was considered to be a firm supply, developed specifically for the Cutler-Orosi Area by AID through Proposition 50 funding. The draft consolidation agreement between Cutler and Orosi says that 2,800 AF is considered firm supply and states a draft contract with COSWPA exists, to be executed in the event funding for a SWTP can be secured. P&P has requested the Proposition 50 closure report and draft contract from COSWPA and AID for review. At the Cutler and Orosi joint board meeting in August 2025, it was stated that conversations are taking place with AID to draft an agreement relating to surface water supply that will be available for review in December 2025. The District Engineer for Cutler PUD and Orosi PUD (Keller) had previously advised P&P that AID would not relinquish any portion of its pre-1914 water rights to the Communities, nor enter into a contract for delivery of water until the SWTP project moves forward. Tulare County provided a letter from AID regarding a pledge to commit to supply 2,000 to 2,300 AF/yr made in 2013, contingent on execution of a formal contract.

There are no facilities below AID's point of measurement at Frankwood Ave for the transfer of Kings River water to the FKC. Also, because AID only operates during the summer months, getting a steady flow of surface water from Cobbles Wier to any potential pumping location at the rate demanded by the communities throughout the year is not feasible. Constructing separate facilities for pumping into the FKC would still necessitate an exchange agreement with an FKC contractor to enable delivery of the whole surface water supply during AID's irrigation season as described above. Such a pump station would need to deliver the surface water supply over a 3-month period. Based on experience with prior projects we can estimate an order of magnitude cost for construction of a new pumping facility of $500,000 to $1,000,000, excluding environmental compliance, and permitting. If CVP water or use of an existing facility is negotiated, this cost would not need to be included in the project cost, so it has not been included in project cost estimates at this time.

The use of the existing pump facility between the point of diversion at Cobbles Weir and the point of measurement, would need to be negotiated. (Dennis R. Keller / James H. Wegley, 2015) proposed utilizing these existing facilities above AID's point of measurement. However, as these are not owned by AID, this would require a separate negotiation with the owner. The existing pumps are in the 100 to 150 cfs capacity range, so their use would similarly require partnering with another entity on the FKC to take that delivery of the entire water over a matter of days and regulate the supply to the communities throughout the course of the year. This would be more difficult in a dry year if there are reduced volumes in the FKC. It is understood that the existing pumps are permitted to pump flood flows; it is not known currently if the permitting allows for use outside of flood events.

5.2.1 SURFACE WATER COSTS

The actual cost of water will need to be determined by the Communities through negotiating a water exchange contract with AID, another CVP district, or a combination of both, to secure the surface water supply. In determining the costs of water for the purposes of financial analysis for the alternatives in this Study, this section compares known costs from other districts. The 2019 and 2025 South Kings Groundwater Sustainability Plans use a cost of $395 per AF in the operational cost of their recharge projects. The source of this $395 per AF cost is a contract between Consolidated Irrigation District and the South Kings Groundwater Sustainability Agency (GSA).

Comparatively, Orange Cove's transfer agreement with Lower Tule Irrigation District provides for a series of 500 AF options that require a one-time payment of $250,000 per increment, equating to $500 per AF for water. The available supply of this water can be reduced during years with low snowpack and drought conditions.

AID's Proposition 218 report used a cost of $214/AF for the development of supplies through the construction of recharge facilities (Engineer's Report for Alta Irrigation District Proposition 218 Procedures for Benefit Assessments, 2022). This cost was based on the 2019 Kings River East Groundwater Sustainability Plan (KREGSP), which is in the process of being updated for 2025, however the 2025 report remains in the draft stage.

While the consideration of delivering the water through an otherwise empty FKC during a dry year remains a challenge, it is suggested that negotiations with AID include the potential for 2 years supply of water to be retained behind the Pine Flat dam to meet the regional demands in dry years. Based on the $214/AF recharge cost this would generate a cost of $642 per AF delivered (based on 2 years storage plus current year supply at $214 per AF recharge cost), however review of annualized storage costs associated with recent projects to increase storage in the state show that this cost may be low.

- Construction of Sites Reservoir is estimated to cost $850 per AF of supply.
- Raising of San Luis Reservoir is estimated to cost $485 per AF of supply.
- Los Vaqueros reservoir expansion project is estimated to cost $1,000 per AF of supply.

Both the $395 per AF and $500 per AF figures mentioned above, are several years old and the duration and any year-on-year price escalations in those contracts is unknown. The range of costs discussed above spans from $395 to $1,000 per AF for supply with an average of $645 per AF. This is consistent with the $642 per AF determined by multiplying AID's Proposition 218 figure by 3 to account for 2 years of storage. In the absence of a negotiated cost of water from AID, $645 per AF will be utilized as the estimated cost of a drought firm supply. However, storage costs, pumping costs, wheeling charges in the FKC will elevate this cost further and are discussed below in greater detail. Finding a partner that will guarantee surface water delivery in dry years is critical to the project. The actual figure will be subject to negotiation with a surface water provider.

5.2.2 VOLUMETRIC WATER CHARGES

All water customers of AID, excluding those with parcels classified as Groundwater Only, pay a volumetric surface water surcharge (toll charge) per AF for water measured at turnouts. Customers with parcels classified as Groundwater Only pay the volumetric surcharge plus an additional charge of $3.00/AF, when water is available for them to take. Both charges are independent of an entitlement category assigned to a parcel. The toll charge was established in 2001, initially at $1.71/AF, and raised in 2022 to $10.25/AF with the subsequent four years increased for inflation up to an additional 3.5 percent per year to a current maximum of $11.76/AF. It is assumed this charge would apply to get the water from the Kings River point of diversion, Cobbles (Alta) Wier, to the pumping location for transfer into FKC.

5.2.3 FRIANT-KERN CANAL USAGE

A Warren Act contract is required to allow pumping of water into the FKC, alongside an agreement with Friant Water Users Association for the use of the conveyance facility. The published conveyance rates apply to all classes of water deliveries that are conveyed on the FKC on behalf of any non-Long-Term Contractor of the FKC. The rates are split into two categories, 215 and flood water and all other FKC conveyance fees. 215 refers to a section in the Reclamation Reform Act of 1982 relating to temporary water supplies. For the 2024 Water year the non-215/Flood water fee is expressed as a composite conveyance rate of $62.10. Additionally, any contractor wishing to discharge “non-Millerton” water into FKC must, concurrent with its application for a contract or other applicable approval from USBR, obtain a determination from FWA as to compliance with their water quality requirements. The Guidelines Surcharge was $4.58 per AF as of May 2023. Appendix O contains Conveyance Fees for Non-FKC Contractors and “Guidelines for Accepting Water into the Friant-Kern Canal”. In partnering with an FKC exchange contractor these costs would be factored into the agreement.

5.2.4 SUMMARY OF SURFACE WATER SUPPLY COSTS

The following table (Table 5-1) summarizes the total potential cost of a surface water supply. It is important to recognize this does not include treatment costs contained in the respective alternatives. It is also important to recognize the water purchase and storage costs presented in the table will be subject to selection of an alternative and negotiation of an agreement with a supplier to include pumping costs and exchange contract costs.

Table 5-1 Surface Water Supply Cost

SUMMARY	PER AF	Notes
Water (drought) regulation/storage	$645	Reference 5.2.1 Surface Water Costs
Water development (Purchase)	$214	Reference 5.2.1 Surface Water Costs
AID Water Charge (2026)	$11.76	Reference 5.2.2 Volumetric Water Charges
FKC Conveyance	$62.10	Reference 5.2.3 Friant-Kern Canal Usage
FKC Surcharge	$4.58	Reference 5.2.3 Friant-Kern Canal Usage
Total	**$937.44**	

Ultimately, the cost of water is tied directly to the security of the supply. CVP water is divided into classes, with Class 1 having a higher priority for delivery than Class 2. Both will see their respective allocations reduced in dry years with Class 2 seeing the first reductions, however as stated above even Class 1 water has been subject to 0 allocation years in the recent past. Banking of water behind a dam will entail paying for the use of that facility (i.e., Friant or Pine Flat).

5.2.4.1 AID ASSESSMENTS

Property owners within AID, including community members in the study area, are charged AID assessments, which are collected via the County tax rolls. The majority of AID revenue used toward the expenses of operating the irrigation district, and supplying water during the growing season, is generated through assessments allocated to landowners and/or water users within the district. Parcels classified as Urban/Town Groundwater Replenishment rates represent about 4.5 percent of the total AID service area and remained at $11.50 per acre in the 2022 rate adjustment. Landowners paying these assessments are able to receive supplies from AID through normal operations according to the agricultural irrigation schedule, typically May through July. AID operations are not scheduled around providing a reliable source of year-round supply suitable for municipal use. The collection of assessments in Tulare County via the County tax rolls would not be expected to change with or without the proposed project.

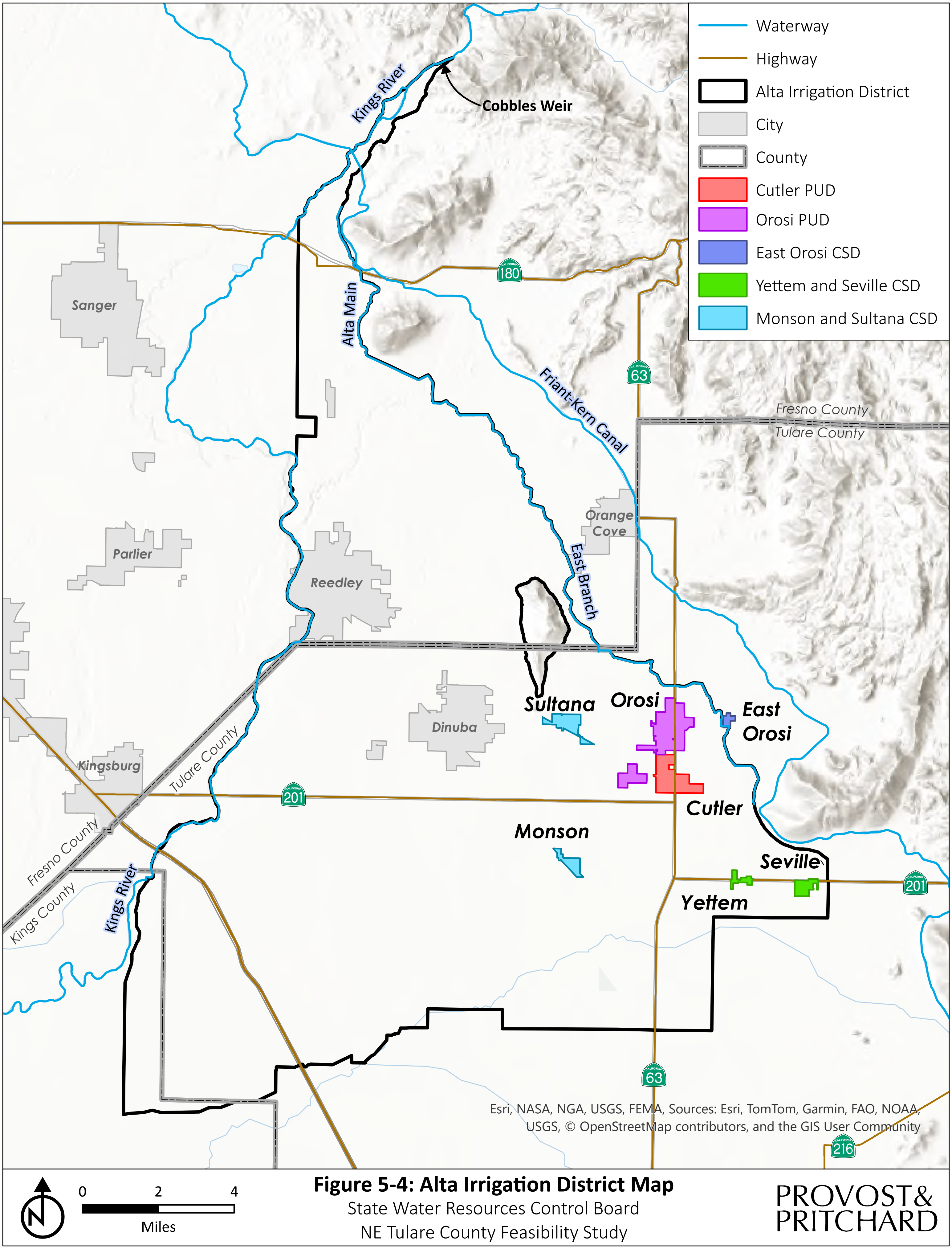

Figure 5-4: Alta Irrigation District Map
State Water Resources Control Board
NE Tulare County Feasibility Study

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6 INFRASTRUCTURE ALTERNATIVES

The previous sections outline that while water supply can be met by the existing and currently planned groundwater wells, including those under construction, there are underlying groundwater quality issues that affect the long-term reliability of the groundwater supply. Emerging contaminants coupled with the impacts of climate change and drought on groundwater levels present an ongoing combination of problems for water systems relying solely on groundwater. Addressing the resiliency of each system within the region in large part has been, or will have been, completed by ongoing projects in accordance with SB 552 requirements.

The addition of CPUD Well C10 and CPUD Well C6 blending, Sultana Well SL4, EOCSD Well E3, together with a planned Yettem Well Y3, should ensure an ample groundwater supply to the region, however in isolation each system has limited capacity to meet SB 552 recommendations for individual small systems which include:

- Having at least one backup source of water supply, or a water system intertie, which meets current water quality requirements and is sufficient to meet average daily demand.
- Ensuring source system capacity, treatment system capacity if necessary, and distribution system capacity to meet fire flow requirements.
- Metering each service connection.
- Providing adequate backup electrical supply to ensure continuous operations during power failures.

To ensure that either the existing groundwater supply, or a new surface water supply, can be efficiently supplied and shared between communities as part of a regionalization project, water system interties are proposed. Keller/Wegley in 2015 proposed a “tree” distribution system, originating at the SWTP to transfer water from single source branching to the most remote connections. This Study will consider a looped system, providing each system with 2 points of connection to the system, where practical. Looped systems in general are less vulnerable to water main breaks, provide lower likelihood of water quality deterioration, and can provide increased fire flow capacity.

For continuous operation during power failures, an adequate backup electrical power supply will need to be provided for each zone where the supply is dependent on power to well pumps or booster pumps associated with tanks.

Backup power generation is located at Cutler Well C6, and the planned Cutler Well C10. The new East Orosi Well being constructed as part of the consolidation project feeds directly into the Orosi system. This well does not appear to have back up power, however Orosi has backup power located at Wells O8 and O10. The East Orosi 90% plans do not show back-up power for the booster pumps feeding the East Orosi distribution system. At least a portable generator may need to be considered at the new tank site, however switch gear and a permanent generator at the East Orosi tank site would be preferred.

The physical connections between Monson and Sultana and between Yettem and Seville provide redundancy of supply. However, where that supply relies on a water storage tank and booster pumps, the ability to operate at least one well and the tank fed booster pumps in each system would be required to maintain operation, distribution system pressure, and operation of chlorination systems and communications. The Yettem tank and booster pumps do not have a generator, however Seville has a portable generator and booster pumps able to maintain pressure in both systems via the interconnecting pipeline. It is noted that the proposed generator at the Yettem Well Y3 site would serve only to feed the Yettem tank and not maintain the distribution system pressure or flows to Seville. A switch gear and generator at the Yettem tank site could be considered during the implementation of that project. The Sultana Well SL4 site is equipped with a standby generator and Well SL3 is equipped with a backup engine.

Table 6-1 demonstrates that MDD can be met for the entire system by the listed wells and tanks provided water system interties capable of distributing the supply and backup power is provided.

Table 6-1 Back Up Power Requirements

DISTRICT/ COMMUNITY	SOURCE	TOTAL CAPACITY (GPM)	STORAGE (GALLONS)	BACK UP POWER
CPUD	Well C10	750	400,000	Yes
OPUD	Well O8	700		Yes
OPUD	Well O10	800		Yes
EOCSD	Well E3	600	330,000	No
Monson	Well M1	400		Yes
Sultana	Well SL4	350		Yes
Seville			211,000	Yes
Total		**3,600**	**941,000**	

6.1 ALTERNATIVE 1 – INDIVIDUAL SYSTEM IMPROVEMENTS AND PHYSICAL CONSOLIDATION LOOP

This alternative includes water system interties extending from Yettem to Monson, Yettem to East Orosi, and Sultana to East Orosi to complete a water system loop for the region. Looping of the 4 communities adds potential sources to each which could potentially be sized to provide fire flow requirements and additionally prepares the communities with the infrastructure required to distribute treated surface water or groundwater from a regional source. This looping takes advantage of existing and proposed interties between Sultana and Monson, Yettem and Seville, Orosi and East Orosi, and Orosi and Cutler. A map of the communities and the proposed interties is provided in Figure 6-1.

This alternative assumes both Orosi and East Orosi as well as Cutler and Orosi are already physically connected and operating as a single water system. The 12-inch interconnection forming the western leg of the loop has already been constructed between Monson and Sultana. Yettem and Seville are being connected by an 8-inch interconnection enabling Seville to receive flows from Yettem, and for the Seville tank to provide storage to the system as part of the Yettem-Seville Phase II project. A second point of connection to Seville is proposed in this alternative, via railroad right-of-way.

Providing interconnecting pipelines would remove the need for the smaller communities to rely on the proliferation of small wells and large storage tanks. The MDD for the region of 3,150 GPM would be met by the wells listed in Table 6-2, producing 3,715 GPM with the largest offline and PHD of 4,725 GPM by the wells total capacity of 4,515 GPM plus the storage facilities which would need to make up the deficit of 210 GPM for 4 hours (a total of 504,000 gallons). This selection removes the older (pre-1990) wells and contaminated sources, paring down the supply closer to what is required to meet the region’s demands. There is room to further evaluate other wells remaining in operation based on desire for redundancy in case a well fails in the future, however each additional well comes with operational costs which must be borne by the communities. For the purposes of this section, it is assumed wells not listed will be rendered inactive and disconnected from the system. This alternative would utilize the 9 wells, and 4 storage tanks listed in Table 6-2.

The connection of the systems into one operational water system is its own independent alternative, and it is also considered a base alternative on which the remaining alternatives would build, including shared surface water supply.

Table 6-2 Wells and Storage Utilized in Alternative 1

DISTRICT/ COMMUNITY	SOURCE	DATE CONSTRUCTED	DEPTH	TOTAL CAPACITY (GPM)	STORAGE (GALLONS)
CPUD	Well C9	2007	515	300	
CPUD	Well C10*	2016	440	750	400,000
OPUD	Well O5A	1990	433	525	750,000
OPUD	Well O8	1996	455	700	
OPUD	Well O10	2006	496	800	
EOCSD	Well E3**	2027		600	330,000
Monson	Well M1	2017	920	400	
Sultana	Well SL3	1996	430	540	
Sultana	Well SL4	2023	620	350	
Seville		2020			211,000
TOTAL	PHD (GPM)	4,725	Total Capacity	4,965	1.69 MG
	MDD (GPM)	3,150	Firm Capacity	4,165	

*The expected production of CPUD Well 10 is 750 GPM per Project Specifications.
**EOCSD Well 3 capacity has been estimated as 1,200 to 1,400 GPM, however the well is not yet completed. Prior to completion, a more conservative value of 600 GPM is used to ensure demands can be met without overreliance on this source prior to completion.

6.1.1 EFFECT ON INDIVIDUAL SYSTEM OPERATION

6.1.1.1 MONSON

Monson is the low point in the system at approximately 320 feet elevation. Monson Well M1 currently fills the 60,000-gallon water storage tank directly. Booster pumps maintain pressure in the distribution system. The existing pressure reducing valve (PRV) installed on the 12-inch line from Sultana prevents excess water pressure within the Monson distribution system due to the approximately 50-foot elevation difference between Sultana and Monson. This PRV, however, will prevent flow around the looped regional system. Relocating the PRV to the connection with the Monson distribution system will enable the loop to function effectively. The recommendation is that the loop bypass Monson and two points of connection, each with PRVs, would serve the Monson distribution system which will operate as a separate pressure zone.

At Monson's PHD of 57 GPM, the head loss in 4 miles of 12-inch piping is minimal. The MDD (36 GPM) plus Fire Flow (1,500 GPM) split between pipelines from Yettem to Monson and Sultana to Monson would require 768 GPM in each. The resulting head loss is approximately 12.5 PSI which is less than the elevation 30-foot elevation difference. Without regular flow through the loop, assuming half of MMADD originates from Sultana and half from Yettem, the travel time of water in 4 miles of 12-inch pipeline at 10 GPM each would be upwards of 8 days. Cycling the 60,000-gallon tank at 21 GPM adds upwards of 2 days to water age and breaking the pressure then requires the stored water to be pumped back into the distribution system. It may be recommended to remove the 60,000-gallon tank and instead connect the well to the loop via a hydropneumatic tank. This would also require re-bowling the well pump and upsizing the motor but would eliminate both the water age concerns and costs of operating and maintaining the tank and booster pumps. When called, the well would produce 400 GPM, of which only 21 GPM is required locally by Monson. 200 GPM in each 12-inch pipeline would produce a velocity of 0.6 ft/sec in each leg of the loop, displacing the volume of water in the pipeline over approximately 10 hours of operation.

6.1.1.2 SULTANA

Sultana is at an elevation of approximately 365 feet. Sultana's wells pump directly into the distribution system. Hydropneumatic tanks maintain pressure in the distribution system and will continue this operation with the connected regional water system loop. Sultana's wells have a combined capacity of approximately 890 GPM, so during periods when Sultana's demand is at or below MMADD of 171 GPM, their well production has the potential to supply 719 GPM to other communities. The 12-inch pipeline loop would permit transfer of water 3 miles to Orosi, or 9 miles to Yettem (via Monson). Yettem and Seville have a combined peak demand of 293 GPM. Supplying excess water from Sultana to Yettem at peak hour flows it would take approximately 16 hours to turn over the pipeline. During MDD (257 GPM) plus fire flow (1,500 GPM) demands with both Sultana wells operational only 867 GPM would be required to be made up by supply from the pipeline connections to Orosi and Yettem via Monson. In a situation where neither well was available, the MDD plus fire flow demand would be balanced between the two connected systems resulting in a demand of approximately 1,200 GPM from Orosi and 600 GPM from Monson and Yettem. The sizing of a 12-inch pipeline limits the potential head losses to 21 PSI, an upstream pressure of 55 PSI should be more than adequate to maintain a downstream residual of 20 PSI for fire flow. Peak flows at Sultana are only 389 GPM, or 433 GPM including Monson. Even in a situation where neither Sultana well was operating, system pressure could be maintained from wells in Orosi and the Monson well.

6.1.1.3 YETTEM-SEVILLE

Yettem is at an elevation of approximately 350 feet. The Yettem wells pump directly into a 150,000-gallon water storage tank. Booster pumps maintain pressure in the distribution system, and the 8-inch connection to Seville. The Yettem wells have limited capacity and water quality that requires blending. Together with the age of the tank and the operational costs of multiple wells and treatment by blending leads to the conclusion that these facilities should be abandoned in this alternative. In the event Yettem Well Y3 produces an adequate amount of good water quality it can be evaluated how best to connect it to the system to provide additional redundancy.

The Seville wells similarly provide a minimal flow, 15 GPM to the system, and would not provide enough benefit to the consolidated system to merit the ongoing operational costs of these wells. The 211,000-gallon water storage tank in Seville is intended to fill primarily from the Yettem connection during periods of low demand (high system pressure). Booster pumps at the Seville tank site maintain pressure in the distribution system. The Seville tank is required to meet Seville's fire flow demand as the 8-inch connecting pipeline from Yettem is insufficient to deliver 1,500 GPM while maintaining 20 PSI residual pressure.

Seville is approximately 5 feet higher than Yettem at about 355 feet elevation. Water age concerns with the 211,000-gallon tank can be reduced by ensuring the water delivered from Yettem is directed through the tank prior to being discharged to the Seville distribution system or returned to the loop. A pressure sustaining valve (PSV) and a check valve installed between the discharge from the hydropneumatic tank and the fill line, would enable provision of water from the storage tank to Yettem during periods of high demand but prevent water from the interconnecting pipeline bypassing the tank. Provided that the tank fill valve is closed when the booster pump is operating, Seville's tank and booster can contribute to system storage and fire flow. At 73 GPM MMADD, the 211,000-gallon tank should cycle fully over a 48-hour period. The provision of a second point of connection would provide a redundant source of supply in lieu of maintaining operating wells within Seville.

6.1.1.4 EAST OROSI

East Orosi sits at the highest elevation, approximately 400 feet, with its well located southeast of OPUD. As part of the consolidated looped regional system, the East Orosi tank will receive water from the south via the loop in addition to the supply from Orosi to the west. Booster pumps at the East Orosi tank site maintain pressure in the East Orosi distribution system. Due to the elevation gain it is impractical to expect the lower elevation systems to provide distribution system pressure at East Orosi. Similarly to Seville, the East Orosi tank and booster can contribute to system storage and fire flow by the provision of a check valve and PSV between the distribution system and loop. As with Seville, the tank fill valve should remain closed when the booster pumps are operating. At 114 GPM MMADD East Orosi's 330,000 tank should be fully cycled over a 48-hour period.

6.1.1.5 OROSI

OPUD Wells O8 and O10 pump directly into the distribution system to maintain system pressure. OPUD Well O5A pumps into a 750,000-gallon water storage tank. Booster pumps fed by the tank maintain pressure in the system. The intersection of Ave 416 and SR 63 in Orosi is approximately 380 feet elevation. The new East Orosi supply well also discharges to the OPUD system. The four wells, totaling 2,625 GPM capacity, continue to provide water to meet the Orosi, East Orosi, and Family Center MDD, with excess capacity available to supplement neighboring Cutler and other communities via the looped water main.

6.1.1.6 CUTLER

Cutler Well C9 pumps directly into the distribution system. Cutler Wells C6 and C10 will pump into the 400,000-gallon tank, once equipping of the site has been completed. Booster pumps at Well C10 will maintain distribution system pressure. The Well C10 tank site is at an elevation of approximately 360 feet. This alternative utilizes 1,050 GPM of production from Cutler Well C9 and Well C10. Additional capacity is available from Well C6 with implementation of blending, however with the 987 GPM excess from Orosi and East Orosi, the total of 2,037 GPM exceeds the Cutler MDD of 1,134 GPM. Modifications to the blending tank will be required to enable filling from the distribution system, with controls to prevent the fill valve opening while the booster pumps are operating so the pumps are not simply recirculating water.

6.1.2 DESCRIPTION

This alternative will include the following key project components:

- Connect Yettem to Monson by installation of approximately 5 miles (26,400-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Connect Sultana to Orosi by installation of approximately 3.5 miles (18,480-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Connect East Orosi to Yettem by installation of approximately 4 miles (21,120-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Second point of connection to Seville by installation of approximately 2-miles (10,560-linear feet) of 8-inch PVC water main, valves, and appurtenances.
- Replace Monson 60,000-gallon tank and booster pumps with hydropneumatic tank.

- Re-bowl Monson Well and replace motor to discharge to loop via new hydropneumatic tank.
- Monson onsite and offsite piping to discharge to loop separate from distribution system.
- Install PRVs at 2 points of connection from loop to Monson distribution system.
- Abandon Yettem and Seville existing wells.
- Demolish Yettem 150,000-gallon tank and appurtenances.
- Install switch gear and backup power generator at the East Orosi tank site.
- Install switch gear and backup power generator at the East Orosi Well E3 site.
- Install PSV and check valves between the distribution systems and the tanks at Orosi, East Orosi, Cutler, and Seville to enable tanks to fill from distribution system pressure during periods of low demand while returning water to the system during high demand periods.
- Install check valve at Seville to ensure the distribution system water passes through tank but can be returned to Yettem during peak and fire flow demands.
- Controls modifications to close fill valves when tank booster pumps are operating.

6.1.3 ENVIRONMENTAL IMPACTS

Environmental impacts related to this project would be temporary and related to construction.

- Noise will be generated during construction. Construction hours of operation will be limited to daytime in conformance with any local ordinances to minimize impacts on residents.
- Dust prevention measures will be implemented to prevent the nuisance of airborne particulates and comply with the Air Quality District requirements during construction.
- Best management practices will be employed to prevent storm water pollution during construction. Construction will comply with local requirements and statewide general construction permit (if applicable).
- Environmental compliance documents for compliance with the California Environmental Quality Act (CEQA) and federal crosscutting requirements would be necessary for this project to comply with funding program requirements that include federal funds. It is assumed that an Initial Study/ Mitigated Negative Declaration (IS/MND) would be the appropriate level of environmental document required for this project.
- Traffic control will be implemented throughout the project area to minimize impacts to neighboring properties during construction.
- A biological investigation would be conducted to identify any potential protected endangered species within the project area. Species of concern should be identified early in the process and take permits considered as the presence of Tiger Salamander and Fairy Shrimp are known to have impacted project timelines of nearby projects.
- The proposed second point of connection to Seville, via railroad ROW, is adjacent to the Stone Coral Ecological Reserve. The California Department of Fish and Wildlife will need to be consulted regarding this area, in addition to authorizing incidental take permits in other areas that are not as readily identifiable at this stage.

6.1.4 LAND REQUIREMENTS

No land acquisition is anticipated for the physical consolidation of the community water systems.
The alignment of the water mains will be in the County right-of-way. Additional encroachments permits will be required for crossings of railway, Caltrans, and irrigation district rights-of way and facilities. A longitudinal encroachment permit from Caltrans will be required for SR 201 between Yettem and the intersection with SR 63.

The second point of connection to Seville relies on utilizing railroad ROW, tentatively identified as the former Porterville-Orosi District line, purchased by Tulare Valley Railroad (TVRR) in 1992. TVRR is part of the San Joaquin Valley Railroad (SJVR) and part of the western region division of Genesee & Wyoming Inc.

(G&W). Review of G&W utility specifications indicates increased cover, wall thickness, or a casing may be required for a longitudinal carrier pipe withing their ROW, subject to approval by G&W engineering staff.

Work at existing tank and well sites will be confined to the existing sites and existing easements, and no additional land is expected to be needed.

6.1.5 CONSTRUCTION OR SITE CONSIDERATIONS

Typical construction considerations such as traffic control, dust control, and worker protection are routinely managed by construction contractors and should not be a hurdle for the project. Detours will likely be required, especially in areas where the installation will occur in built up areas where multiple conflicts with existing utilities can be expected.

Crossing of AID facilities will require maintaining required clearances below the invert of pipelines or canals and vary based on the type and condition of the AID facility. Work impacting AID facilities will generally be limited to outside of the irrigation season. Construction techniques may be open cut or require a trenchless approach such as horizontal directional drilling or bore and jack. At the feasibility study stage, the total number of crossings and specifics of each crossing have not been investigated in detail.

6.1.6 OPERATION AND MAINTENANCE COSTS

Comparison of alternatives based on life cycle costs for Alternative 1 includes the potential for savings based on eliminating sampling and operation and maintenance costs for several wells and tanks utilized by the communities which would no longer be required to operate once the Alternative is implemented.

6.1.6.1 SAMPLING

DDW requires sampling of each water source on a regular basis for various contaminants. The most common regular testing requirement is the monthly bacteriological (BAC-T) test for coliform, which also applies to any storage tanks and post treatment processes. For the NTC region, most of the groundwater wells are subject to monthly testing for nitrate, which is a similarly straightforward test with analysis of each sample costing around $35. Every 3 years, each municipal well is required to undergo sampling for the full range of potential Title 22 contaminants. Analysis depending on the selected laboratories' current rates, can be expected to be around $3,500. Another significant consideration in the NTC region is the number of wells requiring testing for TCP and DBCP. When required to be monitored, these quarterly monitoring tests can be expected to cost approximately $150 each.

Table 6-3 Budgetary Laboratory Testing Costs

SAMPLING COSTS	PER ANALYSIS	ANNUAL BUDGET
3 Year Drinking Water Matrix	$3,500	$1,167
Monthly BAC-T	$35	$420
Quarterly Nitrate	$35	$140
Quarterly TCP/DBCP	$150	$600
	Total	$2,300 per Well $420 per Tank

The resulting estimated sampling expenses are applied across each system. The 7 communities currently operate 16 wells, while Alternative 1 would supply the region with only 9 wells in operation, reducing the overall system sampling costs (see Table 6-4).

Table 6-4 Budgetary Laboratory Testing Costs per System

ANNUAL COSTS	CUTLER	OROSI	EAST OROSI	YETTEM-SEVILLE	MONSON-SULTANA	7 SEPARATE COMMUNITIES	ALTERNATIVE 1
Wells*	3	4	1	5	3	16	9
3 Year Drinking Water Matrix	$3,500	$4,667	$1,167	$5,833	$3,500	$18,667	$10,500
Monthly BAC-T	$1,260	$1,680	$420	$2,100	$1,260	$6,720	$3,780
Quarterly Nitrate	$420	$560	$140	$700	$420	$2,240	$1,260
Quarterly TCP or DBCP	$1,800	$2,400	$600	$3,000	$1,800	$9,600	$5,400
Tanks*	2	1	1	2	1	7	4
Monthly BAC-T	$840	$420	$420	$840	$420	$2,940	$1,680
Total	$7,820	$9,727	$2,747	$12,473	$7,400	$40,167	$22,620
*Number of Wells and Tanks in this table is the number expected to remain at the completion of current projects							

While it is understood that each well has unique sampling requirements based on constituent detection from prior samples, this table demonstrates how significant costs can be eliminated by removing smaller wells from service and utilizing the larger capacity wells or alternative supplies to meet the needs of all the communities. When a system pays the same sampling costs per well regardless of whether that well is producing 15 GPM or 1,500 GPM, it makes sense to eliminate smaller less productive wells where possible. In addition, the impact of a nitrate, TCP, or DBCP hit on a small system resulting in a greater testing frequency is commensurably greater with less connections over which to spread the resulting costs.

6.1.6.2 OPERATOR REQUIREMENTS

Developing a budget for staffing of the water systems assumes the operator's time requirement and costs are directly related to the number of well and tank sites required to be attended to. A contract operator was expected to cost $24,000 annually per the 2018 Yettem-Seville rate study. An assumption of 3 hours per week per site at a cost of $80 per hour generates a similar per site cost of $12,480 per site.

The resulting site-based (well or tank) operating expenses applied across each system, all 7 communities and Alternative 1, is as follows in Table 6-5.

Table 6-5 Budgetary Operator Costs per System

	CUTLER	OROSI	EAST OROSI	YETTEM-SEVILLE	MONSON-SULTANA	7 SEPARATE COMMUNITIES	ALTERNATIVE 1
Sites	5	8	2	7	4	23	13
Contract Operator $12,480 per site per year	**$62,400**	**$99,840**	**$24,960**	**$87,360**	**$49,920**	**$287,040**	**$162,240**

As with the sampling costs, a reduction in the number of facilities requiring operation to serve the region represents a significant potential saving for the communities.

The total population served by combining the systems would be greater than 10,000, requiring a D3 chief operator, which Cutler currently employs, and D2 shift operators, which both Orosi and East Orosi currently have operating their system. Cutler's operator is additionally T3, which exceeds the expected requirements for the current and planned blending operations, and Orosi, East Orosi operators are T2 as is the operator for YSCSD and SCSD.

6.1.7 COST ESTIMATE

A cost estimate including life cycle costs for Alternative 1 with breakdown of total capital, operation and maintenance (O&M), and capital replacement costs is provided in Table 6-6 below. A more detailed breakdown of the opinion of probable construction costs is provided in Appendix P.

Table 6-6 Alternative 1 Project Cost Summary

ITEM DESCRIPTION	ESTIMATED COST
Construction Costs	$22,490,000
Non-Construction Costs*	
Engineering Design (12%)	$3,508,000
Construction Management and Inspection (7%)	$2,047,000
Environmental, Legal, and Administration (5%)	$1,462,000
Cost Contingency (30%)	$8,852,000
Total Project Cost	**$38,359,000**
Groundwater Operational Costs	($142,350)
Annual Maintenance and Capital Replacement Costs	$787,150
Estimated Annual O&M Costs	**$644,800**
Present Value of O&M Costs**	**$9,593,000**
Total Life Cycle Cost	**$47,952,000**
*Does not include LAFCo and legal fees dependent on consolidated system governance selection **Present Value is based on 3% rate applied to Annual O&M Costs over a 20-year period	

The sampling and operational savings associated with removal of wells described represent a reduction in operational and labor costs in Table 6-6. The additional cost is 3.5%, applied to the capital cost of the interconnecting pipelines comprised of 1.0% maintenance, and 2.5% replacement reserves.

6.1.8 RECOMMENDATIONS FOR FURTHER STUDY

There is insufficient information, including lack of known pump curves, distribution system layouts, and lack of a topographic survey of the region, to create a complete and properly calibrated hydraulic model of the interactions between the 7 distribution systems. However, for the purposes of this Study, it is assumed each system is capable of maintaining at least 55 PSI at its own MDD, and by inference sufficient pressure exists to move water between systems. A model was developed using these limited criteria to gauge the effects of connecting the individual systems and to guide decision making, even if the parameters are inexact and require further study.

Figure 6-2 shows both the potential consolidation alignments and the resulting maximum and minimum pressures resulting at each point of connection based on the existing hydropneumatic tank operating ranges maintaining 35-65 PSI. Notable areas for further refinement include evaluating the potential for low pressures (<20 PSI) at the high point of the system in East Orosi and alleviating the high pressure (90 PSI) experienced at the low point of the system in Monson. Raising the low end of the operating range on the supply wells from 35 PSI to 40 PSI could be expected to alleviate the low-pressure concerns, while PRVs would regulate the system pressure at Monson.

A complete rate study should be completed to explore the effect of consolidation on water rates dependent on the selected governance in combination with the selected physical alternative.

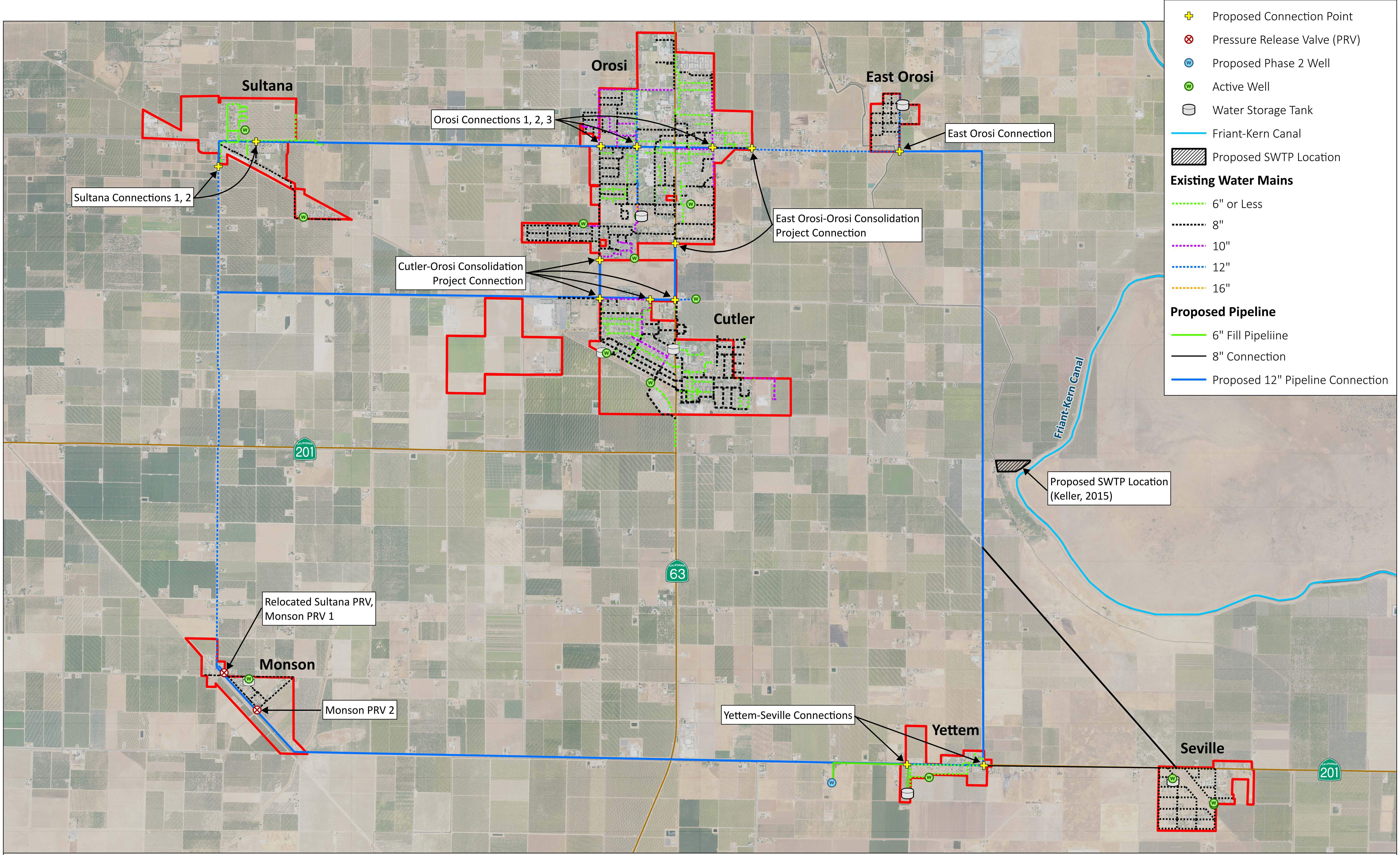

Figure 6-1: Potential Consolidation Alignments

State Water Resources Control Board

NE Tulare County Feasibility Study

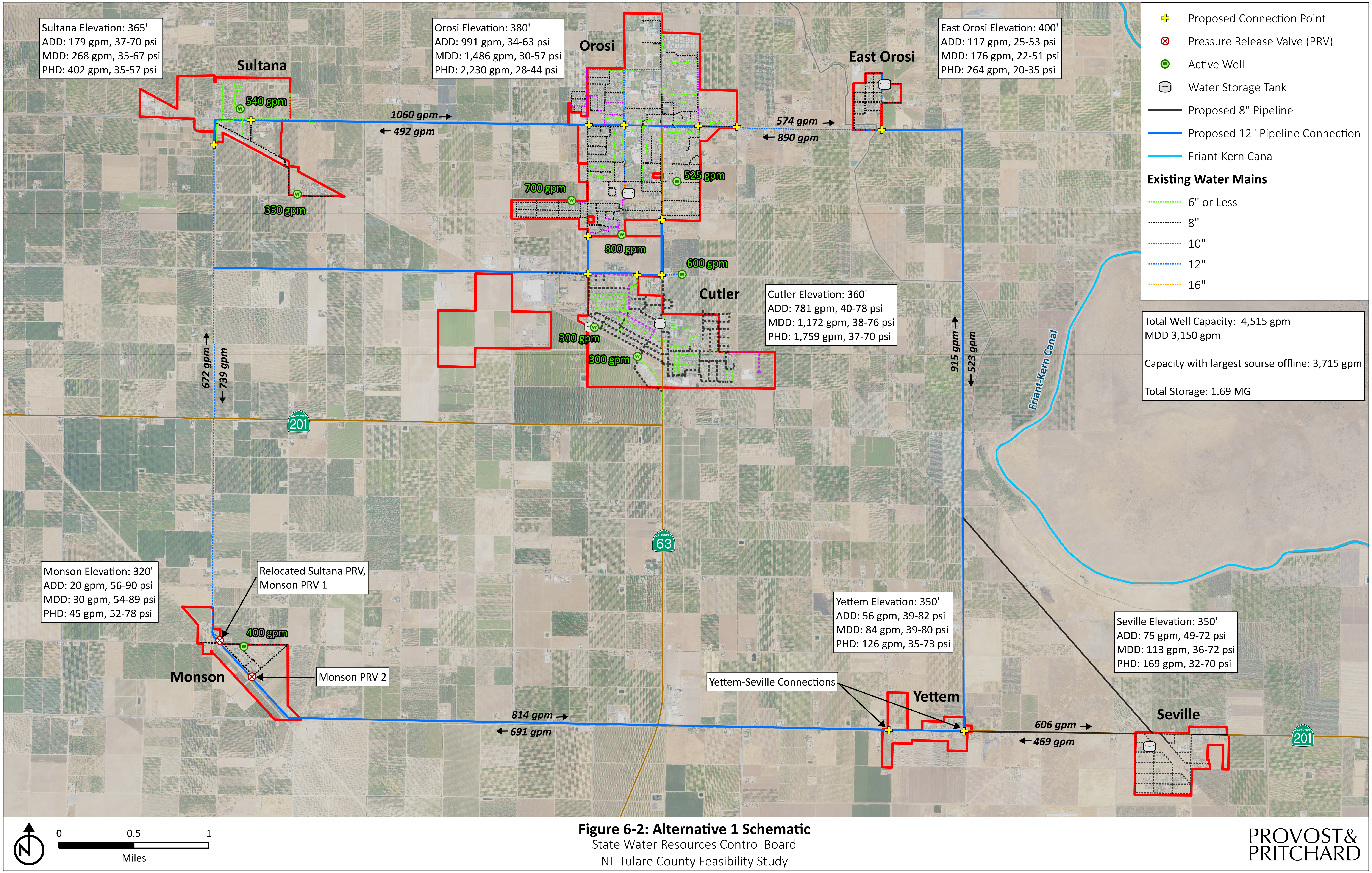

Figure 6-2: Alternative 1 Schematic

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PROVOST & PRITCHARD

6.2 ALTERNATIVE 2 – REGIONAL SURFACE WATER TREATMENT PLANT PARTIAL SUPPLY

Alternative 1 provides the physical consolidation and interconnection of the systems. This alternative adds additional infrastructure to enable supplementing the existing groundwater sources with treated surface water. By maintaining sufficient wells in operation this alternative would be less reliant on the surface water supply and have sufficient groundwater supplies to fall back on during drought years.

6.2.1 DESCRIPTION

This alternative includes the following key components, in addition to those included in Alternative 1:

- Development of an agreement for the purchase of surface water.
- Construct FKC turnout.
- Raw Water pipeline to SWTP, installation of approximately 3.5 miles (18,480-linear feet) of 18-inch PVC water main, valves, and appurtenances.
- Orosi Well O8 blending supply pipeline to SWTP, installation of approximately 3,500-linear feet of 8-inch PVC water main, valves, and appurtenances.
- Orosi Well O10 blending supply pipeline to SWTP, installation of approximately 1,400-linear feet of 8-inch PVC water main, valves, and appurtenances.
- East Orosi Well E3 blending supply pipeline to SWTP, installation of approximately 1,000-linear feet of 8-inch PVC water main, valves, and appurtenances.
- Finished Water pipeline to distribution system, installation of approximately 3,000-linear feet of 16-inch PVC water main, valves, and appurtenances.
- 2 million gallon per day (MGD) Surface Water Treatment Plant described below.

Alternative 1 improvements to groundwater supply and distribution loop.

- Connect Yettem to Monson by installation of approximately 5 miles (26,400-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Connect Sultana to Orosi by installation of approximately 3.5 miles (18,480-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Connect East Orosi to Yettem by installation of approximately 4 miles (21,120-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Second point of connection to Seville by installation of approximately 2-miles (10,560-linear feet) of 8-inch PVC water main, valves, and appurtenances.
- Replace Monson 60,000-gallon tank and booster pumps with hydropneumatic tank.
- Re-bowl Monson Well and replace motor to discharge to loop via new hydropneumatic tank.
- Monson onsite and offsite piping to discharge to loop separate from distribution system.
- Install PRVs at 2 points of connection from loop to Monson distribution system.
- Abandon Yettem and Seville existing wells (4 total).
- Demolish Yettem 150,000-gallon tank and appurtenances.
- Install switch gear and backup power generator at the East Orosi tank site.
- Install switch gear and backup power generator at the East Orosi Well E3 site.
- Install PSV and check valves between the distribution systems and the tanks at Orosi, East Orosi, Cutler, and Seville to enable tanks to fill from distribution system pressure during periods of low demand while returning water to the system during high demand periods.
- Install check valve at Seville to ensure the distribution system water passes through tank but can be returned to Yettem during peak and fire flow demands.
- Controls modifications to close fill valves when tank booster pumps are operating.

The proposed plant location and pipeline alignments are shown in Figure 6-3.

6.2.2 SYSTEM OPERATION

This alternative considers operating the SWTP as a supplement to existing groundwater supplies, reducing groundwater demand from the aquifer within the area, and benefiting both the communities and regional recharge efforts. The alternative considers a site capacity that can provide the 2,100 GPM MMADD for 8 hours per day (1 MGD) for the region. Blending is proposed to mitigate both disinfection by product (DBP) formation and general water chemistry compatibility issues.

Operating 8 hours a day, the SWTP would produce 0.67 MGD of treated surface water, blended with 0.33 MGD from existing groundwater wells, to provide 2,100 GPM while the plant is operating. The remaining groundwater supply wells would produce the remainder of the MDD to accommodate maximum days and peak hours, as well as MMADD for the remainder of the day while the SWTP is offline. Wells O8, O10, and E3 and the other remaining wells identified in Alternative 1 are also able to meet MDD while the plant is offline between shifts or due to FKC maintenance.

6.2.2.1 WATER RIGHTS

Water rights for the surface water supply are discussed Section 5.2 above. COSWPA JPA documents refer to having contracted with AID for 2,800 AF of surface water, which would be adequate for the region. This is understood to be a verbal agreement, which cannot be contracted until a SWTP is funded. If this alternative is to be developed further, the next steps would include negotiations with a surface water provider for the water supply and refining the associated costs.

Table 6-7 Water Supply Requirements

COMMUNITY	MAX YEAR (MG)	MAX YEAR (AF)
Cutler	253	777
Orosi	479	1,471
East Orosi	27	83
Monson	17	52
Sultana	25	77
Yettem	7	21
Seville	57	175
Total	**865**	**2,656**

This alternative considers operating the SWTP to supplement existing groundwater supplies and reduce overdraft of the aquifers within the basin benefiting both the communities and the region. Production of 1 MGD of blended water at a 67% surface water to 33% groundwater ratio would require purchase of only 0.67 MGD (752 AF) of surface water, as opposed to the 2,656 AF that would be needed to meet all the water demand from the communities. A benefit to this approach is that the existing wells will need to be retained for times when the FKC is down for maintenance, and therefore this takes advantage of those existing wells while also providing a surface water supply. Additionally, this would reduce the susceptibility of the communities to potential fluctuations in the cost of surface water in dry years.

6.2.2.2 TREATMENT PLANT CAPACITY

In order to provide 1 MGD of blended water daily during a single manned 8-hour shift per day, 7 days per week, the plant capacity would need to be 1,400 GPM (2 MGD) with 700 GPM (1 MGD) available for blending from Wells O8, O10, and E3.

The proposed 1,400 GPM treatment train could produce 2 MGD of treated surface water prior to addition of groundwater if it were to be operated 24 hours per day. If the treatment plant is permitted to operate unattended, then daily production capacity can be increased, dependent on surface water purchase, or the number of treatment trains reduced. This is explored further in Alternative 3.

6.2.2.3 UNIT PROCESS DESIGN

Raw water will be conveyed from an intake/diversion structure located at the Friant-Kern Canal by an 18-inch transmission pipeline to the location of the surface water treatment plant. The planned capacity of the plant and relatively low raw water turbidities makes it a good candidate for a package style water filtration system that includes an up-flow adsorption clarifier adjacent to a mixed media filter, such as the Trident system provided by Westech. Trident treatment technology has been demonstrated to satisfy the operational and performance requirements necessary to be accepted as an alternative filtration technology under the California Surface Water Treatment Rule. The basic treatment process will therefore consist of the following steps:

1. Raw water screening at the canal turnout
2. Prefilter pH adjustment and coagulant addition
3. Polymer addition
4. High-rate solids contact clarification (first stage of package filtration unit)
5. Mixed granular-media filtration (second stage of package filtration unit)
6. Sodium hypochlorite disinfection
7. Final chlorine residual, pH, and alkalinity adjustment
8. Blending with groundwater

In addition to these treatment processes, the plant will also include washwater reclaim and residuals management systems. A potential layout of the treatment plant can be seen in Figure 6-4.
Specific and notable components of the plant include the following:

- Raw water screening structure and pumping station.
- Packaged filter system consisting of one (1) 1,400 GPM unit.
- Transfer pumping station.
- 330,000-gallon tank (finished water).
- 1 MG tank (blending).
- Chemical storage building.
- High service pumping station.
- Backwash pumping station.
- 150,000-gallon washwater equalization basin.
- Reclaim pumping station.
- Washwater clarifier.
- Sludge holding tank.
- Screw press.
- Space for future GAC vessels.

The location for constructing the treatment plant has been tentatively selected along Avenue 408, between the highest demand communities of Cutler and Orosi. Dependent on availability of land, the site that is ultimately selected should be strategically located to take advantage of blending with the compliant groundwater wells that are already available to the consolidating systems to diminish the potential for disinfection byproducts in the system. As such, the plant layout shown in the figure is schematic in nature and could be shifted as needed to fit into the treatment plant parcel.

Options for discharge of sludge dewatering water that cannot be reclaimed will need to be considered. Onsite disposal will require construction of ponding basins; while permitting a discharge to Sand Creek or an AID canal would require additional permitting and environmental review by the appropriate regulatory agencies. The disposal of backwash water to the sewer system should be a last resort, however a sewer service connection will be required for facilities at the treatment plant for operators and staff.

6.2.2.4 DISTRIBUTION WATER QUALITY CONCERNS

Disinfection byproducts (DBPs) are formed when disinfectant residuals, often in the form of free chlorine, combine with naturally occurring organic matter. Surface water treatment requires both primary and secondary disinfection stages. Primary disinfection provides the log inactivation required for giardia lamblia cysts and viruses to prevent water borne illness. Primary disinfection requires a Concentration for a required Time (CT) to achieve the targeted disinfection. This disinfection process can be completed with high concentrations for less time or low concentrations for longer times but in practice, most primary disinfection processes use a free chlorine concentration of less than 2 mg/L. Some organic compounds in the water, typically represented by total organic carbon (TOC), react with chlorine to form DBPs. DBP formation is closely correlated to contact time with free chlorine, in that the longer the disinfectant remains in contact with organic matter, the more likely it is to react and form DBPs.

There are two regulated categories of DBPs, both of which are a group limit made up of multiple compounds. Total Trihalomethanes (TTHMs) include a group of 4 different disinfection byproducts that together have an MCL of 80 ug/L. The four regulated TTHMs include chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

Haloacetic Acids (HAA5) are a group of 5 halogenated acids with a combined MCL of 60 ug/L. These MCLs are enforced based on a locational running annual average of each monitoring location on a quarterly basis. The five haloacetic acids included in the regulation are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

Each of these regulated compounds have varied characteristics, for example, chloroform is volatile enough to be removed through aeration or air stripping, while the other compounds are not as easily volatilized. Some of the haloacetic acids can be broken down through biologically active filters while the TTHMs will not. As a result, the primary method of DBP control is to prevent the formation of DBPs in the first place by increasing the removal of TOC from the filtered water.

The type and species of DBP depends on which compounds are the most prevalent in the source water TOC. The two nearest surface water systems to the potential regional plant that are also supplied by the Friant-Kern Canal (and therefore potentially the most representative of source water quality) are the City of Orange Cove (approximately 7.5 miles to the northwest) and the City of Lindsay (approximately 24 miles to the southeast). The City of Orange Cove has had several exceedances of the HAA5 MCL in the past decade, but never consistently enough to bring the quarterly running annual average above the limit. The City of Lindsay has had numerous exceedances of both the HAA5 and TTHM MCLs in the last several years that were consistent enough to bring it out of compliance for both constituents and cause the city to begin looking for solutions. The most likely cause of the consistent DBP exceedances is the city’s practice of dosing chlorine at the canal turnout before any TOC has been removed by the treatment plant, in conjunction with long post-chlorination residence times in transmission and distribution piping. As a result of the water quality challenges faced by these two nearest systems utilizing the same source water, it is reasonable to expect that the source water at the regional surface water plant would be prone to DBP formation following disinfection as well, which is an especially major concern given the long expected residence times to the users on the outskirts of the system whose usages do not necessitate large flows. Estimating the type and species of the DBPs and their formation would require a comprehensive sampling regimen at the expected intake location on the Friant-Kern Canal.

In addition to potential issues with DBP formation, there are other water quality concerns associated with the introduction of surface water into legacy water distribution systems that have previously only been exposed to groundwater. The surface water in the FKC is much lower in mineral content and alkalinity than the groundwater and this will tend to result in the surface water being corrosive if pH and alkalinity are not raised as part of the water treatment process. Even with pH and alkalinity adjustment of the treated surface water, it is possible that distribution system water quality will be adversely affected for a period of time due to existing scales and biofilms adjusting to the new water quality.

As will be discussed below, the proposed blending of water from existing groundwater wells with treated surface water would be expected to partially mitigate both DBP and general water chemistry compatibility issues. In addition, such a blending approach could also be used to mitigate water quality issues associated with the existing well water.

6.2.2.5 DISINFECTION STRATEGY

The consolidated water system will be required to achieve a minimum log inactivation level of Giardia cysts, viruses, and cryptosporidium through the disinfection process at the SWTP. Log inactivation through disinfection is based on the disinfection residual multiplied by the contact time of the delivered dose. For this alternative, free chlorine will be used for disinfection and contact time will be established in the finished water storage tank.

Free chlorine is the most commonly used disinfectant due to its efficacy in inactivating harmful bacteria and viruses, while also being cost-effective and fairly straightforward to operate. The downside, as discussed in the prior section, is when chlorine combines with naturally occurring organic matter, disinfection byproducts can be formed. There are other options for primary disinfectants that could reduce the formation of TTHMs and HAA5s, including ozone, ultraviolet light, or chlorine dioxide, but use of these alternative disinfectants would complicate the operation of the treatment plant and create new regulatory challenges. Utilizing chlorine as a primary disinfectant and converting to chloramines for secondary disinfection in the distribution system is likely to reduce DBP formation, but is also known to create operational difficulties including the challenge of controlling nitrification in the water distribution and storage tanks, an issue that would also be exacerbated by the prolonged residence time expected in the system. Therefore, in cases such as this, it often makes the most sense to minimize the level of TOC present when chlorine is added as opposed to using an alternate disinfectant.

Carefully optimized clarification and filtration processes can achieve significant removal of TOC; however, most TOC is in a dissolved form and typically greater than 50% of the TOC will remain downstream of the filters. A granular activated carbon (GAC) treatment process can be placed between the filters and the point of chlorine addition to provide additional TOC removal. GAC excels at removing many dissolved organic constituents from water through the physical process of adsorption. A GAC contactor allows water to pass through a bed of GAC where the constituent molecules are captured onto the surface of numerous pores present within the granules. Backwashing does not remove the accumulated TOC and eventually the carbon media becomes exhausted and needs to be replaced. While this would likely aid in preventing the formation of DBPs, it would also have significant capital and ongoing costs, specifically for media replacement.

A third option for reducing TOC levels is to blend with water sources that have low or no levels of organic matter, like most groundwater sources. Lowering TOC levels through blending with groundwater post-treatment can greatly mitigate the formation of DBPs and effectively dilute any that have been formed to well below their respective MCLs. In this case, because of the availability of high-quality groundwater sources in the vicinity of the largest users of the system, this is likely the most practical option for preventing DBP issues. While there will be some capital costs associated with transferring the groundwater to the treatment plant/blending site and modifying well pumps in doing so, the ongoing costs of this option would be minimal compared to adding a treatment process or more complex disinfectant strategy. A target blending ratio of 67% surface water to 33% groundwater would be the initial recommendation and could be adjusted as needed. This blending operation also provides the opportunity to potentially to blend down nitrate or other contaminants in the groundwater supply down to levels below the MCL should they ever be exceeded. Additionally, there will be space saved on the treatment plant site for the installation of GAC vessels as a backup plan should the need ever arise for it.

6.2.2.6 OPERATOR REQUIREMENTS AND EXPERTISE

The surface water treatment plant would be classified as a T3 treatment facility and therefore require a minimum T3 certified chief operator and minimum T2 certified shift operator. The distribution system would likely retain the same population-based classification of D3 as determined in Alternative 1.

6.2.2.7 SYSTEM HYDRAULICS

An 18-inch pipeline from the canal turnout to the SWTP is proposed to convey raw water from the FKC to a wet well at the SWTP site. The proposed SWTP location between Orosi (370 feet elevation) and Cutler (360 feet elevation) would be approximately 365 feet elevation, well below the FKC elevation of 415 feet elevation. An 18-inch pipeline would be adequate to convey the design flows from the FKC to the raw water wet well at the SWTP by gravity.

Treated surface water would be blended with groundwater from OPUD Wells OO8 and 10 and EOCSD Well E3. These wells can produce up to combined 2,100 GPM on their own, providing up to 3,500 GPM of blended surface and groundwater to the communities to meet MDD while the plant is in operation.

While the plant is not in operation the remaining wells utilized in Alternative 1 would supply the communities. These wells are listed in Table 6-2 and supply a firm capacity of 3,715 GPM.

6.2.2.8 CONJUNCTIVE USE OF GROUNDWATER

It is the intent of this alternative that the groundwater wells remain active to supplement and provide blending with the surface water supply. Ongoing projects and Alternative 1 enable the systems to consolidate and physically interconnect their compliant groundwater wells without being reliant on surface water deliveries to meet MDD. The provision of surface water in this alternative will benefit the communities and region by reducing groundwater pumping and facilitating groundwater recharge during wet years when surface water is available.

6.2.2.9 STRATEGY FOR CANAL MAINTENANCE

The nine (9) wells listed in Alternative 1 have capacity to meet the system MDD without the use of surface water, therefore the system will remain able to meet MDD during FKC shutdowns of any duration at any time of the year.

6.2.3 ENVIRONMENTAL IMPACTS

Environmental impacts of the connecting pipelines and raw water pipelines will be largely similar to those described in Alternative 1.

An important difference with this Alternative is the required work on the FKC to install a turnout and requirements for the use of the canal for conveyance will necessitate NEPA review in addition to CEQA requirements.

Environmental review and permitting will be required for disposal of backwash water to ground, or to a conveyance, either Sand Creek, or an AID facility. Should disposal of water from solids thickening or dewatering be to a sewer system, the criteria and flow limitations may be limited by the receiving system and WWTF (OPUD or CPUD, dependent on location, and COJPWA).

6.2.4 LAND REQUIREMENTS

As with Alternative 1, no land acquisition is anticipated for the physical consolidation of the community water systems. The alignment of the water mains will be in the County and Caltrans ROW. Encroachment permits will be required for crossing of railway, Caltrans, and irrigation district rights-of way and facilities. Similarly, the raw water pipeline and pipeline connections from Well O8 and Well EO3 will be located in existing County and Caltrans ROW. The pipeline from Well O10 is proposed to exit the rear of the Well O10 site and enter the treatment site alongside the Sand Creek alignment in ROW belonging to AID.

Work at existing tank and well sites will be confined to the existing sites and easements.

Land acquisition will be required for the surface water treatment plant. The site selected in 2015 appears to remain vacant; however, a more centrally located site is recommended. Piping raw water from the canal for treatment closer to the most concentrated demands in the Cutler and Orosi area is proposed to enabling blending with groundwater prior to delivery to the distribution system to alleviate DBP and water quality concerns. The proposed layout would require a minimum of 4 acres of land.

6.2.5 CONSTRUCTION OR SITE CONSIDERATIONS

Construction considerations will be as described in Alternative 1. As the work will require construction of a turnout in the FKC, dewatering of a section of the FKC for construction will likely be required. This will need to be coordinated with the FWA and United States Bureau of Reclamation and likely need to occur during a scheduled FKC maintenance period, potentially providing a window for construction only every 3 years.

6.2.6 OPERATION AND MAINTENANCE COSTS

Comparison of alternatives based on life cycle costs for Alternative 1 included the potential for savings based on eliminating sampling and O&M costs for several wells and tanks which would no longer be required to operate should Alternative 1 be implemented. This alternative maintains the same level of groundwater supply so there is no further reduction to groundwater operational and sampling costs above what was presented in Alternative 1.

The additional operational costs associated with the SWTP will include surface water purchase costs, operator labor for running the plant 50-60 hours per week, chemicals, sampling, and power (pumping) costs, and equipment maintenance costs, as necessary.

Table 6-8 below shows the estimated frequency and laboratory costs for sampling that will be required with the addition of the SWTP into the water system, including source and treated water samples for TOC, and samples for TTHMs and HAA5s at various points throughout the distribution system.

Table 6-8 Budgetary Surface Water Laboratory Testing Costs

SAMPLING COSTS	YEARLY SAMPLES	PER ANALYSIS	ANNUAL BUDGET
3-Year Drinking Water Matrix (Source)	0.33	$3,500	$1,167
Annual GM/GP/IO	1	$350	$350
Weekly BAC-T (Source)	52	$35	$1,820
TTHM (4 per quarter)*	16	$100	$1,600
HAA5 (4 per quarter)*	16	$175	$2,800
Monthly TOC (Source and Treated)	24	$55	$1,320
Monthly Alkalinity (Source)	12	$40	$480
Total			**$9,600**
*Frequency may be reduced after one year of monitoring if levels are below 50% of MCL			

Ongoing costs for other expenses related to the operations and maintenance of the SWTP based on treating 752 AF annually can be seen in Table 6-9 below.

Table 6-9 Alternative 2 SWTP O&M Cost Summary

SWTP OPERATIONAL COSTS	ANNUAL BUDGET
Raw Water Purchase	$706,000
Chemicals	$63,000
Sampling	$10,000
Labor*	$349,000
Power	$130,000
Maintenance	$122,000
Total	**$1,380,000**
*Assumes supervised operation is required at the SWTP	

6.2.7 COST ESTIMATE

A cost estimate including life cycle costs for Alternative 2 with breakdown of total capital, O&M, and capital replacement costs, is provided in Table 6-10 below. A more detailed breakdown of the opinion of probable construction costs is provided in Appendix P.

Table 6-10 Alternative 2 Project Cost Summary

ITEM DESCRIPTION	ESTIMATED COST
Construction Costs	$47,334,000
Non-Construction Costs*	
Land Acquisition	$308,000
Engineering Design (12%)	$7,384,000
Construction Management and Inspection (7%)	$4,307,000
Environmental, Legal, and Administration (5%)	$3,077,000
Contingency (30%)	$18,723,000
Total Project Cost	**$81,133,000**
Groundwater Operational Costs	($142,350)
Surface Water Operational Costs	$1,380,000
Annual Maintenance and Capital Replacement Costs	$1,656,690
Estimated Annual O&M Costs	**$2,894,340**
Present Value of O&M Costs**	**$43,061,000**
Total Life Cycle Cost	**$124,194,000**
*Does not include LAFCo and legal fees dependent on consolidated system governance selection. **Present Value is based on 3% rate applied to Annual O&M Costs over a 20-year period	

Alternative 2 includes the same reduction in operational and labor costs as Alternative 1 and adds the additional operational costs for the SWTP determined in Table 6-9. The third component of the additional cost is 3.5%, comprised of the capital cost of the alternative comprised of 1.0% maintenance, and 2.5% replacement reserves.

6.2.8 RECOMMENDATIONS FOR FURTHER STUDY

As with Alternative 1, this alternative relies on existing wells and distribution systems for which only rudimentary modeling has been completed, and which needs to be further refined.

The cost of surface water is a significant unknown, and negotiations will need to be entered into with potential suppliers to more accurately determine the costs once an alternative is selected.

A complete rate study should be completed to explore the effect of consolidation on water rates dependent on the selected governance structure in combination with the selected physical infrastructure alternative.

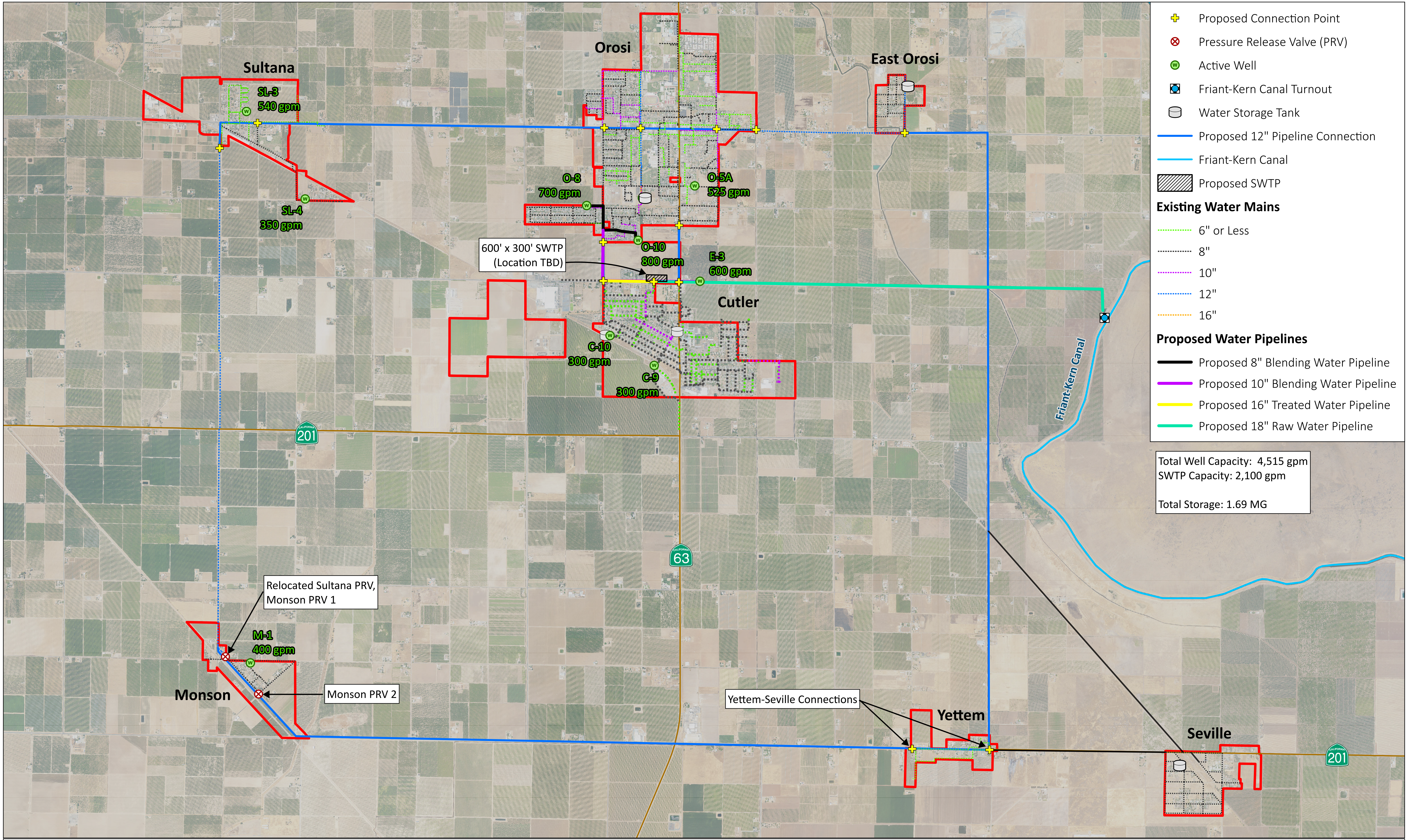
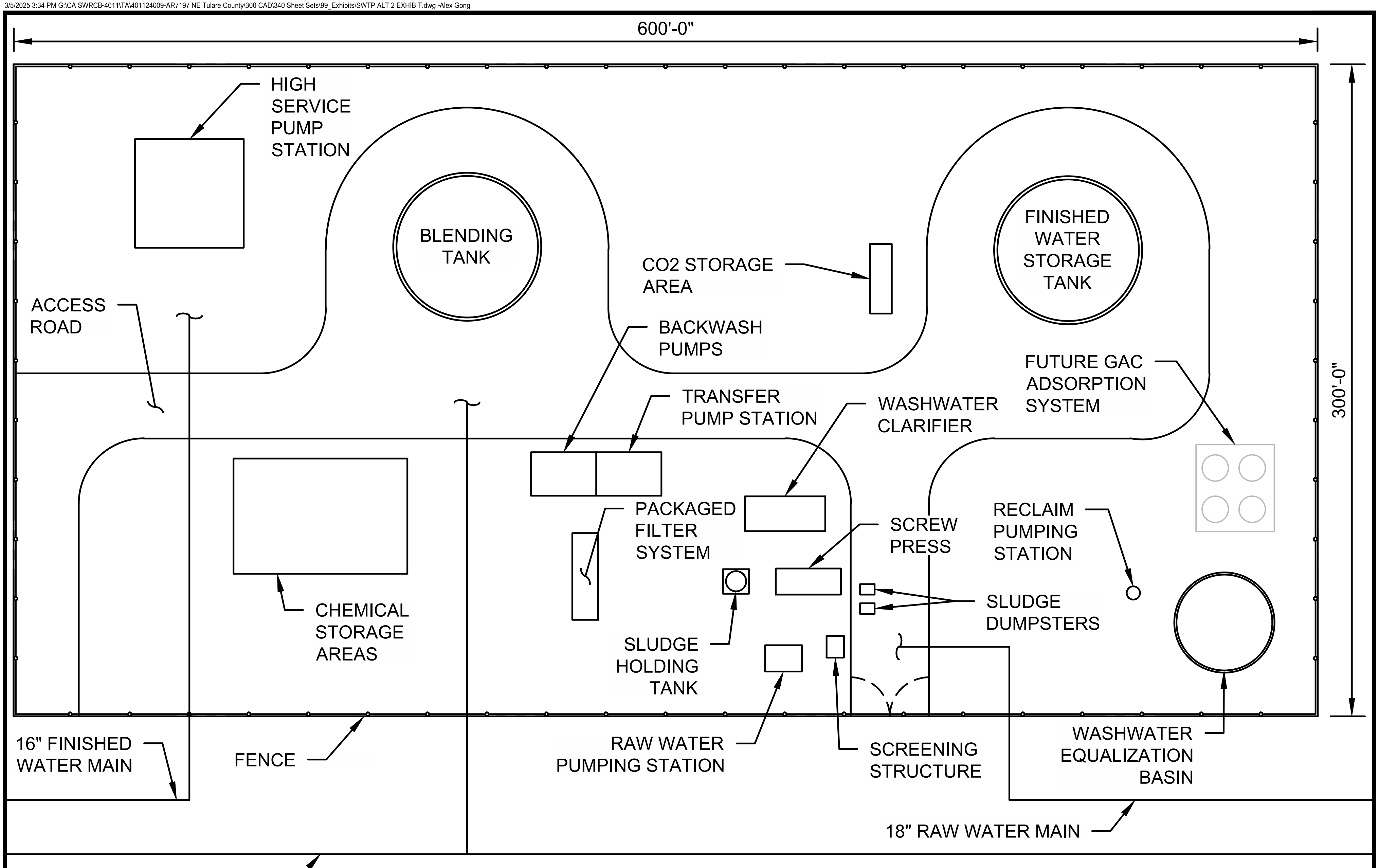


Figure 6-3: Alternative 2 Schematic

State Water Resources Control Board

NE Tulare County Feasibility Study

PROVOST& PRITCHARD



STATE WATER RESOURCES CONTROL BOARD
NE TULARE COUNTY FEASIBILITY STUDY

FIGURE 6-4: ALTERNATIVE 2 SWTP LAYOUT

6.3 ALTERNATIVE 3 – REGIONAL SURFACE WATER TREATMENT PLANT

Alternative 2 described a surface water treatment alternative limited to shift operation working in conjunction with the existing active groundwater wells described in Alternative 1. This alternative considers increasing the daily production capacity of the SWTP to provide the entire water demand without relying on groundwater wells, except blending with existing Wells O8, O10, and E3, which are retained for water quality purposes. This would require the SWTP to include the storage and pumping capacity to deliver the MDD for the complete system. It would also require securing an increased supply of surface water.

6.3.1 DESCRIPTION

Alternative 3 includes the following key components, in addition to those included in Alternative 1:

- Development of an agreement for the purchase of surface water.
- Construct FKC turnout.
- Raw Water pipeline to SWTP, installation of approximately 3.5 miles (18,480-linear feet) of 18-inch PVC water main, valves, and appurtenances.
- Orosi Well O8 blending supply pipeline to SWTP, installation of approximately 3,500-linear feet of 8-inch PVC water main, valves, and appurtenances.
- Orosi Well O10 blending supply pipeline to SWTP, installation of approximately 1,000-linear feet) of 8-inch PVC water main, valves, and appurtenances.
- East Orosi Well E3 blending supply pipeline to SWTP, installation of approximately 3,000-linear feet) of 8-inch PVC water main, valves, and appurtenances.
- 3 MGD Surface Water Treatment Plant.

Alternative 1 improvements to groundwater supply and distribution loop.

- Connect Yettem to Monson by installation of approximately 5 miles (26,400-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Connect Sultana to Orosi by installation of approximately 3.5 miles (18,480-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Connect East Orosi to Yettem by installation of approximately 4 miles (21,120-linear feet) of 12-inch PVC water main, valves, and appurtenances.
- Second point of connection to Seville by installation of approximately 2-miles (10,560-linear feet) of 8-inch PVC water main, valves, and appurtenances.
- Install PRVs at 2 points of connection from loop to Monson distribution system.
- Abandon Yettem and Seville existing wells (4 total).
- Demolish Yettem 150,000-gallon tank and appurtenances.
- Install switch gear and backup power generator at the East Orosi tank site.
- Install switch gear and backup power generator at the East Orosi Well E3 site.
- Install PSV and check valves between the distribution systems and the tanks at Orosi, East Orosi, Cutler, and Seville to enable tanks to fill from distribution system pressure during periods of low demand while returning water to the system during high demand periods.
- Install check valve at Seville to ensure the distribution system water passes through tank but can be returned to Yettem during peak and fire flow demands.
- Controls modifications to close fill valves when tank booster pumps are operating.

6.3.2 SYSTEM OPERATION

This alternative considers the SWTP operating continuously with the ability to provide the complete 3,150 GPM MDD for the region consisting of 2,100 GPM surface water blended with 1,050 GPM groundwater from Wells O8, O10, and E3, which are retained for water quality purposes.

6.3.2.1 WATER RIGHTS

Water Rights for the Surface Water Supply are discussed Section 5.2 above. COSWPA JPA documents refer to having contracted with AID for 2,800 AF of Surface Water which would be adequate for the region. If this alternative is to be developed further, next steps would include negotiations with a surface water provider for the surface water supply and refining the associated costs.

This alternative includes blending treated surface water with groundwater due to water quality concerns described below. A 67% surface water to 33% groundwater ratio would require delivery of 1,780 AF of surface water to produce the 2,656 AF required to meet the annual water demand from the communities as determined above in Table 6-7.

6.3.2.2 TREATMENT PLANT CAPACITY

It is required that the system has the capacity to provide the 3,150 GPM MDD demanded by the communities. Peak hour demands would be handled by the combination of local storage tanks and storage at the SWTP with booster pumps to provide flows to the system.

Without the ability to activate wells to accommodate fluctuations in demand, storage at the plant and through the system should be available to meet MDD, on top of existing requirements to meet 4 hours of PHD and storage of 2 hours fire flow. 1.69 MG is currently stored in the tanks retained in Alternative 1, at least 1 MG storage should be provided at the plant to accommodate 2.4 MG maximum day demand, plus Fire Flow of 180,000 gallons.

6.3.2.3 UNIT PROCESS DESIGN

The basic treatment process for Alternative 3 will be identical to those described in Alternative 2, albeit with some equipment size modifications to treat the increased capacity.

The potential layout of the treatment plant would be largely identical to that shown in Figure 6-4. Specific components listed in the previous section would also remain the same with the exception that the Packaged filter system would consist of two (2) 1,400 GPM units derated to run at 75% of total capacity (design capacity of 2,100 GPM, max capacity of 2,800 GPM) instead of the single unit considered in Alternative 2.

Similar to Alternative 2, the specific location for constructing the treatment plant has not been determined, it is assumed that the plant will be strategically located to take advantage of the compliant groundwater wells that are already available to the consolidating systems to diminish the potential for disinfection byproducts in the system. As such, the plant layout shown in the figure is schematic in nature and could be shifted as needed to fit into the treatment plant parcel.

6.3.2.4 DISTRIBUTION WATER QUALITY CONCERNS

Please refer to the same section in Alternative 2 for a discussion on distribution water quality concerns associated with introducing surface water into the consolidated system, largely pertaining to the formation of disinfection byproducts and the lengthy residence times anticipated in the distribution system (particularly to systems located the furthest from the treatment plant) and corrosion control, as the same concerns apply here. With no backup supply of groundwater available to those systems, the level of concern for DBP formation would be heightened, though the blending strategy at the treatment plant should still help to alleviate that.

6.3.2.5 DISINFECTION STRATEGY

The disinfection strategy for Alternative 3 largely revolves around the prevention of DBP formation as opposed to disinfection itself. The system will utilize chlorine as a disinfectant for log inactivation of bacteria and viruses. Chlorine contact time will be established in the finished water storage tank, followed by blending with up to three groundwater sources in a separate blending tank. A target blending ratio of 67% surface water to 33% groundwater would be the initial recommendation and could be adjusted as needed. Additionally, there will be space saved on the treatment plant site for the installation of GAC vessels as a backup plan should the need ever arise for it.

For additional discussion on the reasoning behind this strategy, please refer to the same section in Alternative 2.

6.3.2.6 OPERATOR REQUIREMENTS AND EXPERTISE

The surface water treatment plant would be classified as a T3 treatment facility and therefore require a minimum T3 certified chief operator and minimum T2 certified shift operator. The distribution system would likely retain the same population-based classification as determined in Alternatives 1 and 2.

6.3.2.7 SYSTEM HYDRAULICS

An 18-inch pipeline from the canal turnout to the SWTP is proposed to convey raw water from the FKC to a wet well at the SWTP site as described in Alternative 2.

The peak hour demand of the region is 4,725 GPM. The largest water usage is by the combined areas of Cutler and Orosi, accounting for 3,989 GPM of this demand. The 12-inch loop described in Alternative 1 relied on multiple local wells and booster pumps at tank sites distributed around the connected systems. As this alternative eliminates the groundwater sources, the total peak hour flow is required to be served from the SWTP and the local tank and booster pumps only. As with Alternative 2 a centralized location for the plant is proposed to serve the high demand areas of Cutler and Orosi with the remaining 5 communities served by the looped system.

Treated surface water would still be blended with groundwater from OPUD Wells O8 and O10 and EOCSD Well E3. These wells can produce up to 2,100 GPM for blending, or when the plant is not in operation. This alternative contemplates the plant remaining in operation 24/7 and additional wells are not required outside of FKC maintenance.

6.3.2.8 CONJUNCTIVE USE OF GROUNDWATER

It is the intent of this alternative that only the three (3) groundwater wells described above remain active and be blended with the surface water supply. The provision of surface water in this alternative will benefit the communities and region by reducing groundwater pumping and facilitating groundwater recharge during wet years when surface water is available. At least one (1) additional groundwater well will need to remain on standby to meet demands during planned FKC shutdowns, which is discussed further below.

6.3.2.9 STRATEGY FOR CANAL MAINTENANCE

With the surface water plant being the sole source of water for the system, a strategy is required to address water needs during months that the FKC is down for maintenance. There are two potential strategies that have been considered.

The first strategy was discussed by Keller/Wegley in the 2015 report considering operating groundwater wells for the 3-month period every 3 years that the FKC was expected to be out of service. As this period would be limited to winter months that report utilized the lower winter usage. As can be seen in Figure 3-1, the maximum month in the summer is 88.2 MG (2.94 MGD), while during winter months, demands are typically under 40 MG per month from November through March. The maximum month during this period from 2020 through 2023 was March 2022 at 44.69 MG. Calculation of the winter month MMADD, MDD, and PHD was completed in accordance with Title 22 and summarized in Table 6-11.

Table 6-11 Summary of Winter Water System Demands

DEMAND TYPE	NOV-MARCH (GPM)
MMADD	1,064
MDD	1,596
PHD	2,395
Fire Flow	1,500

There are a number of active wells that could be considered to meet this winter demand. With the criteria that MDD should be met with largest well offline and the centralized location of most of the demand would suggest the following wells remain online, these are larger, newer wells with the aim to minimize start up and sampling requirements. As Wells O8, O10, and E3 will be utilized for blending and reduction of DBPs only, Well SL4 will be required to start up specifically for FKC Maintenance.

Table 6-12 Wells Selected to Meet Winter Demands

DISTRICT/ COMMUNITY	SOURCE	DATE DRILLED	DEPTH	TOTAL CAPACITY (GPM)
OPUD	Well O8	1996	455	700
OPUD	Well O10	2006	496	800
EOCSD	Well E3*	2027		600
Sultana	Well SL4	2023	620	350
TOTAL	**PHD (GPM)**	**2,395**	**Total Capacity**	**2,450**
	MDD (GPM)	**1,596**	**Firm Capacity**	**1,650**
*EOCSD Well 3 capacity has been estimated as 1,200 to 1,400 GPM, however the well is not yet completed. Prior to completion a more conservative value of 600 GPM is used to ensure demands can be met without overreliance on this source prior to completion.				

An alternative strategy considered excludes utilizing groundwater wells to meet winter demand and requires developing an alternative source of water for periods when the FKC is down for maintenance. The City of Orange Cove, for example, operates storage ponds to ensure adequate supply through the winter. The City of Orange Cove has experienced problems with the capacity of their ponds and due to their ponds being unlined, allowing losses of water through percolation (Appendix M: Orange Cove Permit 03-23-20P-001). While evaporation during winter would be limited and potentially offset by precipitation, lining of the ponds to minimize losses would be required. Assuming a 3-month, (90-day) maintenance period and average month demand for the NTC area of approximately 40 MGD a minimum of 120 MG (370 AF) of storage is required. Adding contingency for a further 30 days in the event maintenance is prolonged, loses due to seepage, or evaporation loses could increase the storage requirement to 160 MG (492 AF). Sizing ponds for 5 ft depth of storage would require a relatively flat area of at least 100 Acres. The land on the east side of the canal rises sharply, making it entirely unsuitable, while the relatively flat west side of the canal is productive agricultural land, predominately established citrus orchards to the north of the 2015 plant location and cattle ranch bisected by the Sontag Ditch to the south. Neither would appear suitable for the construction of surface water storage basins. The ability to find and purchase a suitable 100-acre site in addition to the treatment plant site is a potential fatal flaw in this approach so it will not be considered further.

6.3.3 ENVIRONMENTAL IMPACTS

Environmental impacts of the connecting pipelines and raw water pipelines will be largely similar to those described in Alternative 1.

As with Alternative 2, work is required on the FKC to install a turnout and requirements for the use of the canal for conveyance will add NEPA review in addition to CEQA requirements.

Backwash disposal, other than by sewer connection, presents the same permitting and Environmental challenges described in Alternative 2.

6.3.4 LAND REQUIREMENTS

As with Alternative 1 no land acquisition is anticipated for the physical consolidation of the community water systems. The alignment of the water mains will be in the County right-of-way. Encroachments permits will be required for crossing of railway, Caltrans, and irrigation district rights-of way and facilities.

Work at existing tank and well sites will be confined to the existing sites and easements.

Land acquisition of approximately 4 acres will be required for the surface water treatment plant, matching the layout and location described in Alternative 2.

6.3.5 CONSTRUCTION OR SITE CONSIDERATIONS

Construction considerations will be as described in Alternative 1. As with Alternative 2 the construction of the turnout in the FKC will need to be coordinated with the FWA and United States Bureau of Reclamation.

6.3.6 OPERATION AND MAINTENANCE COSTS

This alternative further reduces the operational costs for the groundwater supply by reducing operational and sampling costs to only 3 wells. A fourth well, SL4, will be required to fulfill the firm capacity with the largest source offline during periods of FKC maintenance. As this well, or another well from Alternative 1 such as O5A, C9, C10, or SL3, would only be required to operate once every 3 years for 3 months the estimated costs to bring a standby well online are presented separately in Table 6-13.

Table 6-13 Alternative 3 Budgetary Groundwater Laboratory Testing Costs

ANNUAL COSTS	ALTERNATIVE 3 WELLS USED FOR BLENDING	FKC SHUTDOWN STANDBY WELL ACTIVATION
Wells	**3**	**1**
3 Year Drinking Water Matrix	$3,500	$1,167
Monthly BAC-T	$1,260	$105
Quarterly Nitrate	$420	$35
Quarterly TCP or DBCP	$1,800	$150
Tanks	**4**	
Monthly BAC-T	$1,680	
Annual Total	**$8,660**	**$1,460**

Table 6-14 Alternative 3 Budgetary Groundwater Operator Costs

ANNUAL COSTS	ALTERNATIVE 3	FKC SHUTDOWN STANDBY WELL ACTIVATION
Sites	7	1
Contract Operator $12,480 per site per year	**$87,400**	**$3,120**

As with the groundwater sampling costs, a reduction in the number of facilities requiring operation to serve the region represents a further reduction in the groundwater operational costs.

The additional operational costs associated with the SWTP will include raw water purchase costs, operator labor for running the plant 168 hours per week, chemicals, sampling, and power (pumping) costs, and equipment maintenance costs, as necessary.

Table 6-15 below shows the estimated frequency and costs of sampling that will be required with the addition of the SWTP into the water system, including source and treated water samples for TOC, and distribution system samples for TTHMs and HAA5s located at various points throughout the system.

Table 6-15 Budgetary Surface Water Sampling Costs

SAMPLING COSTS	YEARLY SAMPLES	PER ANALYSIS	ANNUAL BUDGET
3-Year Drinking Water Matrix (Source)	0.33	$3,500	$1,167
Annual GM/GP/IO	1	$350	$350
Weekly BAC-T (Source)	52	$35	$1,820
TTHM (4 per quarter)*	16	$0	$1,600
HAA5 (4 per quarter)*	16	$175	$2,800
Monthly TOC (Source and Treated)	24	$55	$1,320
Monthly Alkalinity (Source)	12	$40	$480
Total			**$9,600**
*Frequency may be reduced after one year of monitoring if levels below 50% of MCL			

Ongoing costs for other expenses related to the operations and maintenance of the SWTP based on treating 1,130 AF annually can be seen in Table 6-16 below.

Table 6-16 Alternative 3 SWTP O&M Cost Summary

SWTP OPERATIONAL COSTS	ANNUAL BUDGET
Raw Water Purchase	$1,060,000
Chemicals	$95,000
Sampling	$10,000
Labor*	$1,048,000
Power	$196,000
Maintenance	$234,000
Total	**$2,643,000**
*Assumes supervised operation is required at the SWTP	

6.3.7 COST ESTIMATE

A cost estimate including life cycle costs for Alternative 3 with breakdown of total capital, O&M, and capital replacement costs is provided in Table 6-17 below. A more detailed breakdown of the opinion of probable construction costs is provided in Appendix P.

Table 6-17 Alternative 3 Project Cost Summary

ITEM DESCRIPTION	ESTIMATED COST
Construction Costs (Includes 20% Contingency)	$48,472,000
Non-Construction Costs*	
Land Acquisition	$308,000
Engineering Design (12%)	$7,562,000
Construction Management and Inspection (7%)	$4,411,000
Environmental, Legal, and Administration (5%)	$3,151,000
Contingency (20%)	$19,172,000
Total Project Cost	**$83,076,000**
Groundwater Operational Costs	($226,610)
Surface Water Operational Costs	$2,642,000
Annual Maintenance and Capital Replacement Costs	$1,696,520
Estimated Annual O&M Costs	**$4,111,910**
Present Value of O&M Costs**	**$61,175,000**
Total Life Cycle Cost	**$144,251,000**
*Does not include LAFCo and legal fees dependent on consolidated system governance selection **Present Value is based on 3% rate applied to Annual O&M Costs over a 20-year period	

Alternative 3 increases the reduction in operational and labor costs associated with groundwater to the amounts shown in Table 6-13 and Table 6-14 and adds the additional operational costs for the SWTP determined in Table 6-9. The third component of the additional cost is 3.5%, comprised of the capital cost of the alternative comprised of 1.0% maintenance, and 2.5% replacement reserves.

6.3.8 RECOMMENDATIONS FOR FURTHER STUDY

As with Alternatives 1 and 2, this alternative relies on existing wells and distribution systems for which only rudimentary modeling has been completed, which needs to be further refined.

Negotiations will need to be entered into with potential suppliers to more accurately determine the costs and reliability of surface water supply.

A complete rate study should be completed to explore the effect of consolidation on water rates dependent on the selected governance in combination with the selected physical alternative.

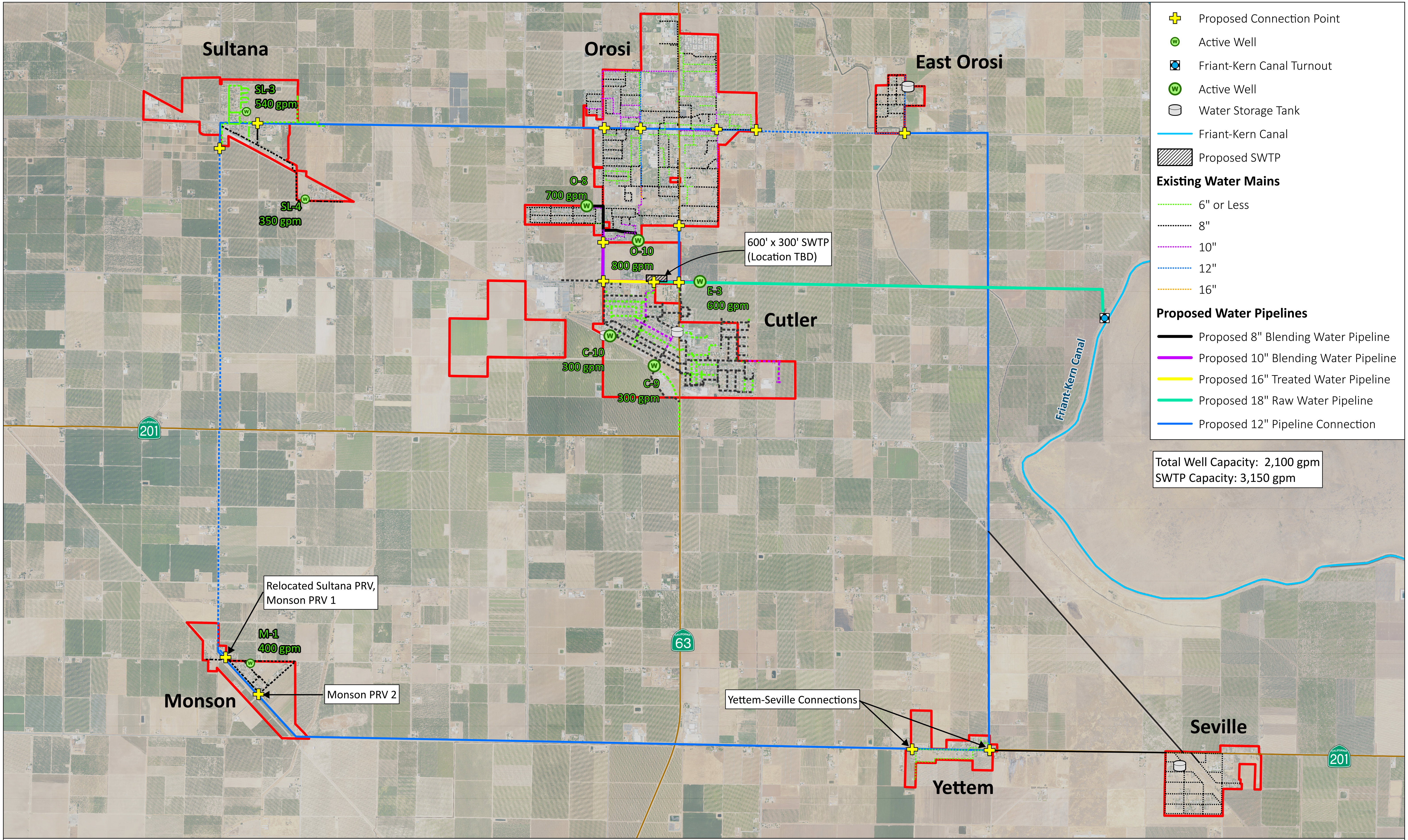


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Figure 6-5: Alternative 3 Schematic
State Water Resources Control Board
NE Tulare County Feasibility Study

PROVOST & PRITCHARD

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6.4 INFRASTRUCTURE ALTERNATIVES COMPARISON

The following table provides a qualitative and quantitative comparison of the alternatives presented above.

Table 6-18 Alternative Comparison

ALTERNATIVE NAME	QUALITATIVE COMPARISON	QUANTITATIVE COMPARISON
Alternative 1 – Individual System Improvements and Physical Consolidation Loop	Advantages: The construction of connections between the systems forming a looped system would provide each community with redundancy in supply. The total number of wells and tanks that would need to remain to serve the population would be reduced, leading to significant O&M savings. Combining the region into a single special district would provide additional savings to the administrative costs of running separate systems. The connection of the systems into one operational water system is considered a base alternative on which the remaining alternatives can build. Disadvantages: Should the existing PUD and CSD structures remain in place there would be little reduction in cost to administer the 7 water systems operating under 5 special districts. There would potentially be increased costs and TMF burden through participation in a JPA, tracking production and usage to allocate costs between districts, and potential for uneven allocation of costs. Dissolving the various entities to create a single CSD district with elections by division would potentially be more difficult but enable better representation and preserve autonomy. Either would require the support of both communities.	Estimated Total Project Cost: $38,359,000 Total Life Cycle Cost: $47,952,000

ALTERNATIVE NAME	QUALITATIVE COMPARISON	QUANTITATIVE COMPARISON
Alternative 2 Regional Surface Water Treatment Plant Partial Supply	Advantages: Alternative 2 builds on Alternative 1 with the addition of a treated surface water supply. A SWTP would require a significant upfront investment. The addition of a surface water supply will reduce the total amount of groundwater pumped and lower the impacts of pumping in the region. Continued operation of the wells identified in Alternative 1 will ensure demands can be met even when the surface water supply is reduced during drought years of FKC maintenance. With sufficient groundwater capacity supply available at all times the plant can be shut down or operation reduced to reduce the number of operator shifts required to attend the treatment plant. Disadvantages: Surface water will need to be procured and delivered via the FKC which will be an added cost to the communities for the raw water supply. Surface water treatment adds operational complexity and TMF requirements resulting in increased operational costs above those of Alternative 1. The reliability of surface water supplies in drought years is uncertain and dependent on releases from storage reservoirs outside the control of the communities.	Estimate Total Project Cost: $81,133,000 Total Life Cycle Cost: $124,194,000
Alternative 3 Regional Surface Water Treatment Plant Full Supply	Advantages: Alternative 3 expands the capacity of the SWTP enabling a greater reduction of groundwater pumping in favor of utilizing a larger treated surface water supply. The addition of a surface water supply will reduce the total amount of groundwater pumped and lower the impacts of pumping in the region. Further reduction of the number of operating wells will reduce the associated operational costs. Disadvantages: A full supply of surface water will need to be procured and delivered via the FKC which will be an added cost to the communities for the raw water supply. The SWTP would be a significant upfront investment for the region. Surface water treatment operational complexity and TMF requirements and the need to continuously operate the plant will impact costs due to additional operator shifts for attendance of the plant. The reliability of surface water supplies in drought years remains uncertain and dependent on releases from storage reservoirs outside the control of the communities. Further reduction of the wells identified will limit the supply of groundwater should the surface water supply is reduced in drought years or during FKC maintenance.	Estimated Total Project Cost: $83,076,000 Total Life Cycle Cost: $144,251,000

7 GOVERNANCE ALTERNATIVES

The success of the regionalization project rests with the ability to consolidate the 7 communities in a manner that results in a mutually beneficial arrangement between the communities served.

Benefits, challenges and outcomes may be impacted by both how the regionalization is structured and how the resulting entity is governed. Three generalized options for structuring the regionalization include an umbrella organization (such as a JPA), a merger where the individual entities form a new combined entity, or an acquisition where one of the existing entities takes ownership for the services of the other existing entities.

At present the communities are represented by multiple separate entities:

- Cutler PUD
- Orosi PUD
- East Orosi CSD (administered by Tulare County)
- Monson WS (served by Sultana CSD)
- Sultana CSD
- CSA #1 Seville Zone of Benefit (previously Seville Water Company)
- CSA #1 Yettem Zone of Benefit
- Yettem-Seville CSD
- Cutler Orosi Surface Water Project JPA
- Northern Tulare County Regional Water Alliance JPA
- Cutler-Orosi Joint Powers Wastewater Authority

It should be noted that two of the JPAs were created for the joint exploration of surface water treatment plant options by the communities. A JPA is an umbrella organization that derives its roles and boundaries from the pre-existing local entities, assuming certain shared roles defined at its formation. As such, JPAs are relatively easy to establish, amend and also dissolve. However, JPAs create redundancies in management, administration, and governance functions.

The status of these JPAs, and their ongoing functionality is questionable where the underlying members face critical shortcomings of Technical, Managerial, and Financial (TMF) capacity, have changed their structure, or are anticipated to merge or dissolve. For example, Yettem-Seville CSD officially assumed ownership of the two water systems from the County in June 2020. When the NTCRWA was formed in 2017 the communities were represented within that JPA by Tulare County as a Zone of Benefit within CSA#1, bringing into question the standing of Yettem-Seville CSD, and consequently the ability of the NTCRWA to function. EOCSD is under a mandatory consolidation order with OPUD, and it is anticipated that all water system operational functions of EOCSD will be transferred to OPUD, which would presumably include its seat on the NTCRWA board. It is simultaneously contemplated that CPUD's water system may consolidate with OPUD, potentially resulting in a single district under the COSWPA.

7.1 OPTIONS FOR GOVERNANCE

There is a wide range of governance options available within California for the purpose of providing water services to consumers. Key attributes and regulations under California law vary between each, however, as applicable to this project can be widely categorized as County Service Area, Special District, Private, and JPA.

The expressed preference of SWRCB when considering consolidations is the merging of small water systems into a single entity with the TMF capabilities to provide sustainable long-term operations. The formation of a single district lends itself to the formation of a special district such as a County Water District, California Water District, Community Services District, Municipal or Public Utility District. Private options include a Mutual Water Company, or investor-owned utilities, subject to CPUC approval and authorization, which has been presented as an option modeled on California Water Service Company (Cal Water) operation of the City of Visalia water system. The formation of a Zone of Benefit within Tulare County Service Area #1 is also presented below, along with the formation of a single JPA, which was attempted under previous efforts. SWRCB has requested submission of a draft joint Governance Term Sheet, developed among the water systems, by December 19, 2025 (See Appendix Q).

7.1.1 JOINT POWERS AUTHORITIES OR AGENCIES

The establishment of a new JPA does not require the consent of an oversight agency, however the previous effort resulted in proposals that were ultimately not accepted by all parties. This impasse prevents serious consideration of the restructuring of one of the existing JPAs given that the formation of the separate COSWPA and NTCRWA was the result of those disagreements. Should the parties be able to reach an agreement on a new JPA with acceptable terms, Tulare County LAFCo would need to be notified, none of the member parties' boundaries would change, and the governing body could be tailored to suit local needs. The water related functions, legal ownership, and the rights to access the distribution facilities and provide service within the respective service areas would be transferred to the JPA. However, it is important to note that a JPA, which leaves in place and derives authority from member agencies, creates redundancies and inefficiencies in management, potentially resulting in additional administrative burdens for the member agencies. For smaller systems already struggling with TMF capacity issues, adding the demands of participation in a JPA could exacerbate these issues. When 5 boards of 5 members (25 Board Members) form a JPA with 1 seat each the result is 30 board seats, examples of JPA exist where there are 2 seats each on the JPA creating 35 board seats, along with the costs of legal counsel, financial audits, and noticing of meetings the long-term viability of a JPA diminishes.

The NTCRWA was initially contemplated with a 7-member board made up of 2 members from CPUD, 2 members from OPUD, 1 from Sultana CSD (also representing Monson), 1 from Yettem-Seville, and 1 from East Orosi CSD. The fatal flaw in this arrangement is understood to have been disagreement between the communities regarding representation, revenues and cost features ultimately rendering the arrangement unaffordable to the smaller communities. NTCRWA was subsequently formed without CPUD and OPUD participation, while CPUD and OPUD separately formed COSWPA.

In the context of ongoing projects, CPUD and EOCSD will potentially no longer exist as member entities with responsibility for water services following their respective consolidations with OPUD. Meanwhile, representatives from smaller systems have stated they want "equal" representation in any governance scenario, which may be irreconcilable as it would leave the populations of the larger communities underrepresented in terms of number of connections. Representation that is fair and equitable is considered to be key to any governance structure.

SWRCB has expressed that fragmented or temporary governance arrangements present long-term risks to operational stability, financial integrity, and equitable service delivery, particularly for small or disadvantaged communities.

Table 7-1 JPA Benefits/Drawbacks

BENEFITS	DRAWBACKS
Easier implementation and less resistance as it relies on existing CSD and PUD structures and boundaries.	Reduced efficiency, increased administration, accounting, auditing, operations, and legal services costs of an additional entity
Retains local autonomy while permitting collaboration	Board members required to serve on multiple boards, meetings for both the existing agencies and JPA to be attended.
Permits flexibility in division of roles and responsibilities. Representation and decision making can be tailored to communities needs	Representation of residents is through member organization rather than direct representation

The service area boundaries of a JPA consisting of the PUDs and CSDs would remain as is, unless action is taken to change the boundaries through LAFCo. Therefore, a JPA would not be able to serve existing well owners along pipeline alignments outside of their districts without initiating a separate LAFCo process for either an extra territorial service agreement or boundary change.

7.1.2 SPECIAL DISTRICTS

There are numerous means to create any of the variety of Independent Special Districts that exist under California Law. These include California Water (California (CA) Water Code §§ 34000 – 38501), Community Services (CA Government Code §§ 61000 – 6125), County Water (CA Water Code §§ 30000 – 33901), Municipal Utility (CA Public Utilities Code §§ 11501 – 14403.5), Municipal Water (CA Water Code §§ 71000 – 73001), or Public Utility (CA Public Utilities Code §§ 15501 – 18055) districts.

Five of the communities are served by three existing Community Service Districts (Yettem Seville CSD, Sultana CSD, and East Orosi CSD) which are formed under CA Government Code §§ 61000 – 6125. The process is initiated by either petition by 25% of registered voters, or by the relevant county board of supervisors by resolution and hearing. A ballot measure, with simple majority prevailing authorizes performance of up to 32 specific services which promote public peace, health, safety, or welfare, including providing drinking water. A CSD is able to establish zones of differential service which have distinct assessments and permit the election of board members at large or by division.

The two existing Public Utility Districts serving Cutler and Orosi operate under CA Public Utilities Code §§ 15501- 18055 and can include other services such as power, heat, transportation, sewage service, and solid waste service, in addition to water. Unlike a CSD, a PUD is not able to establish zones of differential service which have distinct assessments, however, are able to compel service connection.

LAFCo permission is required for either a PUD or CSD to amend their boundaries or to provide out-of-boundary services. Annexed territory must be unincorporated. If non-contiguous, some additional considerations apply in the case of PUDs.

The formation of any new independent special district would potentially be subject to similar representation concerns as based on the populations listed in Table 1-1 Orosi contains 49% of the population, and together Cutler and Orosi represent 86% of the total population. A key consideration of any governance solution would be its ability to balance the representation of the smaller communities, without disenfranchising the larger populations. The lack of districting within a PUD structure prevents elections by division. All the listed Independent Special Districts share the direct election of their board members, with the exception of a Community Services District.

The boundaries of a new CSD would be determined at formation, and therefore additional connections by domestic well users along the alignments could be considered in the process of determining the new boundaries, as applicable. A single CSD, maintaining the district boundaries of the existing PUDs and CSDs as zones of differential service, would potentially be able to elect board members by division, while performing all the existing functions of each PUD and CSD as a single entity. Specific LAFCo approval would be required to include fire protection in the scope of a CSD's function, but otherwise the powers of Eminent Domain, Obligation to provide service, Eligibility and Voter requirements, Rate setting, etc. would remain the same as the existing PUDs. Further details of the formation and founding documents need to be considered in consultation with the communities which would need to petition and ultimately vote on the proposed formation of a new Special District.

SWRCB has recommended that any governance proposal included in the draft Governance Term Sheet be a single, unified, independent special district. Formation of a single Independent Special District to administer to the water systems of the existing entities would provide the following advantages and disadvantages.

Table 7-2 Special District Benefits/Drawbacks

BENEFITS	DRAWBACKS
Due to specialized nature, the governing board members and staff can focus their attention exclusively on drinking water service.	It is potentially difficult and costly to dissolve existing CSDs and establish a single entity due to procedural and study requirements.
Particularly compared to general purpose governments, special districts often have fewer restrictions related to the areas they can serve.	Other functions of the existing CSDs and certainly the PUDs will need to be retained resulting in multiple special districts for different purposes serving overlapping areas.
Increased efficiency, decreased administration, accounting, auditing, operations, and legal services costs of a single entity.	Could eliminate administration and operation positions and jobs tied to the consolidated system(s) which are common to multiple systems.
Voting rights unchanged from those of existing CSD or PUD. A larger pool of potential volunteer board members for fewer positions.	Board member selection is subject to popular vote may result in smaller communities being underrepresented owing to lower population and voting power.
Subject to restrictions from Proposition 218 and Prop 26 around flexibility in pricing and cannot charge above the cost-of-service provision to customers	

The following table, Table 7-3, draws heavily on information contained in Tables A1 through A5 of Designing Water System Consolidation Projects, Considerations for California Communities, (Kristin Dobbin, Justin McBride, and Gregory Pierce). It is provided to highlight differences between various special districts, forming a menu of options for consideration.

Table 7-3 Comparison of Special District Options

SELECTED INDEPENDENT SPECIAL DISTRICTS	CALIFORNIA WATER DISTRICT	COMMUNITY SERVICES DISTRICT	COUNTY WATER DISTRICT	MUNICIPAL UTILITY DISTRICT	MUNICIPAL WATER DISTRICT	PUBLIC UTILITY DISTRICT
Description	A special purpose government agency created to furnish water for beneficial uses.	A special purpose government agency created uniquely to provide services over a designated area.	A special purpose government created within a single county related to either the direct provider of water to consumers or as a coordinator of water rights.	A special purpose government created to combine multiple water utilities into a single utility.	A special purpose government agency created to provide water aimed at an urbanized area.	A special purpose government agency created to establish or operate a revenue-producing utility for unincorporated areas
Services Authorized to Provide	Produce, store, transmit, and distribute water for irrigation, industrial, domestic, or residential use.	Authorized to perform 32 specific services which promote public peace, health, safety, or welfare, including providing drinking water.	Furnish or store water, operate water works, sell water, set water rates. May also provide sanitation service or generate hydroelectric power.	Supply residents with water, light, power, heat, communication services, transportation, solid waste disposal, or wastewater treatment.	Acquire, control, distribute, store, spread, treat, purify, recycle, or recapture any water including stormwater and sewage.	Provide residents with power, heat, transportation, sewage service, solid waste service, or water.
Enabling Act	CA Water Code §§ 34000-38501	CA Government Code §§ 61000-61250	CA Water Code §§ 30000-33901	CA Public Utilities Code §§ 11501-14403.5	CA Water Code §§ 71000-73001	CA Public Utilities Code §§ 15501-18055
Water	Yes	Yes	Yes	Yes	Yes	Yes
Sewer	Yes	Yes	Yes	Yes	Yes	Yes
Street Lighting	--	Yes	--	Yes	--	Yes
Power of Eminent Domain	Yes	Yes	Yes	Yes	Yes	Yes
Ability to Compel Service Connection	Yes	Yes	Yes	Yes	Yes	Yes
Obligation to Provide Service	No	No	No	No	No	Able to exclude any territory which the district does not benefit

SELECTED INDEPENDENT SPECIAL DISTRICTS	CALIFORNIA WATER DISTRICT	COMMUNITY SERVICES DISTRICT	COUNTY WATER DISTRICT	MUNICIPAL UTILITY DISTRICT	MUNICIPAL WATER DISTRICT	PUBLIC UTILITY DISTRICT
Ability to Establish Improvement Districts	Yes	Able to establish zones of differential service which have distinct assessments	Yes	Yes	Yes	No
Ability to Provide Fire Protection	With LAFCo approval	With LAFCo approval	Yes	Yes	Yes	Yes
Means of Initiating Formation	Petition by landowners of a majority of the proposed territory. Simple majority ballot measure.	A simple majority ballot measure following either petition or resolution by board of supervisors	The County board of supervisors hearing petition may either dismiss or order simple majority ballot measure.	⅔ approval by ballot measure following petition	Board of supervisors ratified petition	Petition and ballot measure with simple majority.
Provisions for Mergers	--	Consolidation of special districts not formed pursuant to the same principal act CA Government Code §§ 56826.5	Unless merger into public agency is approved by the vote of the electorate, all funds derived from former district limited to use on that former district until debts paid in full or former electorate authorize other expenditures.	Can annex any other district within the Municipal Utility District's boundaries with the approval of the governing body of the annexed district.	LAFCo has explicit power to annex territory away from or rearrange Municipal Water Districts.	--
Provisions for Service Area Boundary Changes CA Government Code §§ 56133	LAFCo permission needed for changes and out of boundary service.	LAFCo permission needed for changes and out of boundary service.	LAFCo permission needed for changes and out of boundary service.	LAFCo permission needed for changes and out of boundary service.	LAFCo permission needed for changes and out of boundary service.	LAFCo permission needed for changes and out of boundary service.
Contiguous Boundary required?	No	No	No	No	No	No

SELECTED INDEPENDENT SPECIAL DISTRICTS	CALIFORNIA WATER DISTRICT	COMMUNITY SERVICES DISTRICT	COUNTY WATER DISTRICT	MUNICIPAL UTILITY DISTRICT	MUNICIPAL WATER DISTRICT	PUBLIC UTILITY DISTRICT
Provisions for Dissolution or Sale of Assets	--	Requires LAFCo permission to cease providing water if another public agency is picking up service.	--	--	--	--
Stipulations for Collaboration with Other Entities	Can contract with other agencies or private enterprise to fulfill its mission.	--	The district may cooperate with the Federal government under the Federal Reclamation Act for specific purposes. Can be included in Municipal Utility Districts without dissolution.	Authorized to sell surpluses or provide excess capacity to other agencies.	Can contract with other agencies or private enterprise to fulfill its mission.	Can collaborate, but only for water or wastewater treatment.
Rate Setting Limitation	Prop 218	Prop 218	Prop 218	Prop 218	Prop 218	Prop 218
Power to Levy Taxes or Assessments	Prop 26	Prop 26	Prop 26	Prop 26	Prop 26	Prop 26
Power to Place Liens	Yes	Yes	Yes	Yes	Yes	Yes
Power to issue General Obligation Bonds	Yes	Yes	Yes	Yes	Yes	Yes
Eligible for State Grants/Assistance for consolidation projects	Yes	Yes	Yes	Yes	Yes	Yes
Governing Body (may be able to increase subject to LAFCO)	5 member directly elected board	5 member directly elected board, at-large or by division	5 member directly elected board	5 member directly elected board	5 member directly elected board	Board of an odd number by division of approximately 5,000 residents. Default of 3
Eligibility to Serve on Governing Board	Must be either a landowner, or designee of a landowner	Must be a registered voter in the district	Must be a registered voter in the district	Must be a registered voter in the district	Must be a registered voter in the district	Must be a registered voter in the district

SELECTED INDEPENDENT SPECIAL DISTRICTS	CALIFORNIA WATER DISTRICT	COMMUNITY SERVICES DISTRICT	COUNTY WATER DISTRICT	MUNICIPAL UTILITY DISTRICT	MUNICIPAL WATER DISTRICT	PUBLIC UTILITY DISTRICT
Eligibility to Vote for Board Members	Landowners prorated by land value. If the district becomes majority residential, residents may petition for direct elections with simple majority prevailing.	Registered voter	Registered voter	Registered voter	Registered voter	Registered voter
Board Meeting Requirements	Subject to Brown Act.	Must meet at least every three months. Subject to Brown Act	Subject to Brown Act.	Subject to Brown Act.	Subject to Brown Act.	Subject to Brown Act.
Board Training Requirement	2-hour ethics training every 2 years	2-hour ethics training every 2 years and the district shall provide necessary training to board members.	2-hour ethics training every 2 years	2-hour ethics training every 2 years	2-hour ethics training every 2 years	2-hour ethics training every 2 years
Subject to Public Records Act?	Yes	Yes	Yes	Yes	Yes	Yes
Subject to Bilingual Services Act?	Yes	Yes	Yes	Yes	Yes	Yes

7.1.3 COUNTY SERVICE AREA

A county can provide water service as if it were a city, typically to unincorporated areas under CA Government Code §§ 25210 – 25217.4 which authorizes provision of public facilities or services that promote public peace, health, safety, or welfare.

Tulare County operates CSA #1, which encompasses most of the unincorporated areas of the county. The only other Tulare County CSA, CSA#2, consists of Wells Tract, located adjacent to the City of Woodlake and has no bearing on this Study. The County previously provided water services to the Yettem-Seville zones of benefit prior to the formation of the Yettem-Seville CSD, and the County continues to operate the sewer collection system and lift stations within the Yettem-Seville zones of benefit. East Orosi CSD has been managed by the County, having had a Tulare County Administrator since 2022, but remains a CSD and not a zone of benefit within the CSA. The County, East Orosi CSD and Sultana CSD operate sewer lift stations discharging to the Cutler-Orosi Wastewater Treatment Facility, which is operated by COJPWA. The Monson community remains on septic.

Under this CSA governance option, the water service component of each of the CSDs and PUDs would be acquired in full by the County. Each CSD and PUD would become an independent Zone of Benefit within the County CSA#1. While Tulare County is supportive of the communities, taking over operation of their water systems would not be a preferred solution.

Table 7-4 CSA Benefits/Drawbacks

BENEFITS	DRAWBACKS
Review and approval by the necessary regulator, Tulare County LAFCo may be quicker than other alternatives.	County owned and operated water systems are subject to intricate restrictions related to service area, conditions, and duration.
The County has wide-reaching legal and financial powers. The County can leverage its position as a larger organization to share resources and reduce costs.	Potential for water service to be impacted by spillover effects from unrelated political decisions, spending on maintenance may be vulnerable to deferment due to unrelated county priorities, unpopular actions such as raising rates may be deferred due to political expediency.
General purpose elected officials are often more visible and familiar to residents, potentially increasing transparency, and access to decision-making.	The Tulare County Board of Supervisors represent larger populations beyond the zones of benefit, potentially limiting representation and accountability in the eyes of the communities.
Boundaries of the CSDs/PUDs would remain unchanged and ZOB can assessed individually	Requires LAFCo approval to provide Fire Protection.

Formation of a CSA could occur either by petition of 25% of registered voters, or by landholders of 25% of land, or by county board of supervisor's motion. The board of supervisors can veto, rendering this option moot without unequivocal support from the Tulare County Board of Supervisors to move it forward. The boundaries of a CSA would be determined at formation and therefore could consider inclusion of domestic well owners outside the existing PUD/CSD boundaries through that process.

7.1.4 INVESTOR-OWNED UTILITY OR MUTUAL WATER COMPANY

Private organizations and nonprofit organizations offer further options for providing water service. A for-profit corporation could potentially take over and manage the combined water system. A local example is the operation of the City of Visalia where California Water Service Company (Cal Water) has provided service to residents since 1926. As a corporation a private organization has potentially greater flexibility in operational decisions, while still being regulated by state law and the CPUC.

A private organization may still be eligible for state grants and assistance for consolidation projects. Rates and rate changes must be approved by CPUC. They must apply to CPUC, including a business plan, environmental impact assessment, financial conditions, owner profiles, purchase price, and any other information CPUC requires. The CPUC must approve transfer or purchase of over $5 million, even if to a public entity and authorization is required for service area extensions.

Potential disadvantages include that not all government and transparency laws apply. State or Federal funded grants or assistance could be taxable income, and eligibility to vote for board membership is limited to shareholders. Board meetings may be closed to the general public.

Mutual Water Companies are a special purpose cooperative where shareholders co-own their water system. Shareholder status is typically determined by homeownership within the water system's service area and is not considered an applicable governance in the context of a regionalization on this scale.

8 FINANCIAL ANALYSIS

It is not the intent of this Study to include a detailed Water Rate Study for each of the affected systems. The governing boards are responsible for the system operations and maintaining sufficient revenue and reserves for the foreseeable future. Water rate studies are used periodically to review the current rate structures, analyze reserve requirements for system sustainability, and equitably allocate costs across an adequate rate structure. Water rate studies may be informational or prepared in conjunction with changes to the rate structure which, for CSDs and PUDs, requires a Proposition 218 hearing.

To adequately compare the O&M costs for the respective alternatives, it is necessary to estimate planning level operating budget requirements for each system to enable comparisons between current and proposed alternatives. The current water rates reported in the respective eARs discussed in Section 3.4, vary considerably between systems. Some of the systems are reported to be operating at a loss, while others were unable to provide audited financial reports.

The following section reviews what expenses are likely to exist after ongoing consolidations are completed and compares those to the costs of providing the current level of service to make an informed decision regarding the future of the region and communities. For example, East Orosi will only have 1 well, down from 2, while Yettem-Seville may have abandoned one well and drilled up to two more for a total of 5 in operation. Cutler will have gained a tank at the planned blending site, while replacing a well. Sultana will have also replaced a well.

8.1 PLANNING LEVEL OPERATING BUDGET

It is recognized that a regionalized system would be able to consolidate much of the operational expenditure created by duplicated efforts inherent in operating multiple separate systems. In order to elaborate further, the following section provides a planning level operating budgets developed from financial records, rate studies for representative systems, and industry knowledge. Reference is made to OPUD's 2021 Audited Financial Statements, CPUD's 2020 through 2022 Audited Financial Statements, and the Yettem-Seville Water Rate Study prepared in 2018.

Operator costs, sampling, and power costs which are more readily estimated have been included in the respective O&M costs for each Alternative.

8.1.1 BOOKKEEPING, ADMINISTRATION AND OFFICE COSTS

Bookkeeping and Administration requirements are assumed to be generated by the number of connections. Assumptions of administrative and office related costs per 50 connections are summarized in Table 8-1.

Nominal amounts can be assigned to office supplies, materials, postage which can similarly be prorated to the number of customers receiving bills, mailers, and the costs of materials and postage associated with communicating with the customer base.

Table 8-1 Administration and Office Costs

ITEM DESCRIPTION	COST PER 50 CONNECTIONS
Office Supplies	$250
Materials	$500
Postage	$250
Bookkeeping	$1,560
Administrative Assistant	$1,560

The resulting connection-based operating expenses applied across each system, all 7 communities and Alternative 1 is summarized in Table 8-2.

Table 8-2 Administration and Office Costs Per System

	CUTLER	OROSI	EAST OROSI	MONSON-SULTANA	YETTEM-SEVILLE	7 SEPARATE COMMUNITIES	ALTERNATIVE 1*
Connections	1,234	1,601	103	280	155	3,373	3,373
Office Supplies	$6,250	$8,250	$750	$1,500	$1,000	$17,750	$17,000
Materials	$12,500	$16,500	$1,500	$3,000	$2,000	$35,500	$34,000
Communications	$6,250	$8,250	$750	$1,500	$1,000	$17,750	$17,000
Bookkeeping	$39,000	$51,480	$4,680	$9,360	$6,240	$110,760	$106,080
Administrative Assistant	$39,000	$51,480	$4,680	$9,360	$6,240	$110,760	$106,080
Total	**$103,000**	**$135,960**	**$12,360**	**$24,720**	**$16,480**	**$292,520**	**$280,160**

*Applying the costs per 50 connections to the total connections served results in a modest reduction compared to the summation of the same costs applied to the individual systems, as can be expected through economies of scale however cost impact is not anticipated to be significant.

8.1.2 OTHER OPERATING EXPENSES

The remaining operating expenses can be reviewed and applied either per connection for variable costs such as office supplies, discussed above; or fixed per system costs such as election fees, dues and publications, insurance, legal fees, annual audit costs, phone and internet charges for communication. Included below are representative costs of annual account audits, legal representation, insurances, Board member stipends (assuming a 5-member board receiving a $50 stipend month), election fees, memberships and dues, phone, and internet. Office rental has been excluded due to the variances between the 7 communities, ranging from trailers to shared space with other functions of OPUD and CPUD making it impractical to come up with a comparable figure. If rented office space is required, it would be included within this expense category. It may be beneficial to consider office space for the administration staff at the SWTP if either SWTP alternative is further developed. While there may be some variance due to system size, all these costs have to be borne per system and would be significantly reduced by consolidation.

Table 8-3 Selected Operating Expenses to be Considered per Water System

PER SYSTEM	PER SYSTEM/ 1 REGION	7 SEPARATE COMMUNITIES
Audit	$8,000	$40,000
Legal Representation	$12,500	$62,500
Insurances	$8,000	$40,000
Board Member Stipends	$3,000	$15,000
Election Fees	$1,500	$7,500
Membership/Dues	$1,500	$7,500
Phone and Internet	$1,200	$6,000
Total	**$35,700**	**$178,500**

8.1.3 RESERVES

It is inevitable that any given facility will reach the end of its useful life. A new system component with a construction cost of $1 million and a service life of 50 years should in theory be setting aside $20,000 per year to fully capitalize the replacement cost of the infrastructure as it wears out. Large numbers of small systems fall into disrepair as accommodating the full cost of replacement in the water rate is unaffordable to communities, or perhaps they lack the planning to implement sufficient rate structures. The cost to replace all the components of each system is not straight forward given a wide range of installation dates, variance in construction costs, accounting for inflation, varying levels of current reserves and return on investment of those reserves. However, in broad terms using knowledge of recent projects we can assign an order of magnitude value to key components.

The well site component for Sultana CSD Well SL4 was estimated at $741,350 in 2017, while the emergency well for Seville in 2022 was $700,000 on the existing site, and $2,095,000 had a new site been required. The Seville Tank EOPCC from 2013 was $705,000, and the new Yettem Well Site estimate in 2022 was $905,000. East Orosi estimates prepared by QK in 2023 include $675,000 for drilling and equipping the new well and $900,000 for the storage tank prior to any further site or electrical considerations. These and other reference projects form the basis for an estimated order of magnitude replacement cost of $1.5 million per well or tank for reserves planning purposes, while noting this value can be significantly different depending on the size of tank/well.

In Sultana, the distribution system replacement EOPCC was $5,433,960, for 3.3 miles of 6-inch and 8-inch pipeline in 2024 serving 249 connections. This equates to a cost of $22,000 per connection for distribution system replacement. East Orosi estimates prepared by QK total approximately $1,700,000 for 101 connections, or approximately $17,000 per connection. While it is understood that replacement costs for the distribution systems will vary dramatically, particularly in urban areas congested with other utilities in the ROW, the average of $19,000 per connection derived from the Sultana and East Orosi projects has been rounded up to $20,000 to provide an order of magnitude cost for whole system replacement value to be considered in reserves planning.

Assuming 1% repair and maintenance costs and 2.5% depreciation annually, representing a useful life of 40 years is assumed for wells and tanks, and 1% representing a useful life of 100 years for pipelines making up the respective distribution systems. Although this could be broken down further in a more complete rate study to account for the variations in useful life of short-lived items such as pumps to longer-life items such as pipelines.

Table 8-4 Budgetary Capital Replacement Costs and Reserves for Existing Infrastructure

RESERVES	CUTLER	OROSI	EAST OROSI	MONSON-SULTANA	YETTEM-SEVILLE	7 SEPARATE COMMUNITIES	1 REGION*
$1,500,000 per well/tank	$7,500,000	$12,000,000	$3,000,000	$6,000,000	$10,500,000	$34,500,000	$19,500,000
$20,000 per connection	$24,680,000	$32,020,000	$2,060,000	$5,600,000	$3,140,000	$67,460,000	$67,500,000
1.00% Annual Repair and Maintenance	$75,000	$120,000	$30,000	$60,000	$105,000	$345,000	$195,000
2.50% Capital Improvement Reserves (Wells/Tanks)	$187,500	$300,000	$75,000	$150,000	$262,500	$862,500	$487,500
1.00% Capital Improvement Reserves (Pipelines)	$246,800	$320,200	$20,600	$56,000	$31,400	$674,600	$675,000
Total	**$509,300**	**$740,200**	**$125,600**	**$266,000**	**$398,900**	**$1,882,100**	**$1,357,500**

*Costs of operating as a single region are reduced through reduction in facilities necessary to operate, from 19 wells and 7 tanks to 9 wells and 4 tanks described in Alternative 1.

An important consideration for each system is the age and condition of their respective infrastructure against the current status of their reserves. Monson, Sultana, Yettem, Seville and East Orosi have, or will have at the conclusion of currently funded projects, relatively new distribution systems. Cutler and Orosi have older systems and the sufficiency of their reserves to keep up with replacement of distribution piping is unknown.

8.1.4 ESTIMATED OPERATING BUDGET

The following table sums the previous tables to produce an annual operating budget, excluding power, operator, and sampling costs, for each system.

Table 8-5 Planning Level Operating Budget

	CUTLER	OROSI	EAST OROSI	MONSON-SULTANA	YETTEM-SEVILLE	7 SEPARATE COMMUNITIES	1 REGION
Annual Total	$648,000	$754,360	$173,660	$326,420	$451,080	$2,353,520	$1,673,360
Connections	1,234	1,601	103	280	155	3,373	3,373
Annual Per Connection	$525	$471	$1,686	$1,166	$2,873	$697	$496
MHI	$58,692	$52,692	$33,472	$38,125	$39,500	$52,282	$52,282
Affordability Index	0.89%	0.89%	5.04%	3.06%	7.27%	1.33%	0.95%
Monthly Per Connection*	**$44**	**$39**	**$141**	**$97**	**$242**	**$58**	**$41**

*The Monthly Per Connection cost is the operating budget divided by the number of connections. It is not intended to be reflective of a water rate which would allocate costs to higher volume users on the basis of connection size and metered usage.

This section is intended to be illustrative of how a regionalization could bring down the respective costs of water, however a full water rate study would be a necessary component of any selected project and is recommended once an alternative is selected. The rate allocations determined by a water rate study could further reduce the costs for residential connections through applying higher base rates to commercial users and those with larger connections and higher water usage. UOM rates should also be developed to encourage conservation and ensure those users with the highest water use are fairly allocated the respective costs of meeting their higher water demands.

Table 8-6 takes the Present Value of O&M costs for each alternative and divides by the total number of connections (times 12 months) to determine the monthly per connection cost of O&M for each Alternative. Adding the planning level operating budget determined in Table 8-5 permits the calculation of the affordability index for each alternative.

Table 8-6 Affordability of Alternatives

	MONTHLY PER CONNECTION	OPERATING BUDGET	TOTAL RATE PER CONNECTION	AFFORDABILITY INDEX
Alternative 1	$16	$41	**$57**	1.31%
Alternative 2	$72	$41	**$113**	2.59%
Alternative 3	$102	$41	**$143**	3.28%

9 SUMMARY AND NEXT STEPS

Concurrently with the preparation of this Study, OPEETA hosted a series of community workshops seeking engagement and feedback from water system board members and community members. The draft report was provided to the districts and posted on the SWRCB website. Limited formal written comments were received from stakeholders.

Community Workshops were held on the following dates:

- February 26, 2025, in Sultana at Monson Sultana School
- May 7, 2025, in Yetttem-Seville CSD at Stone Coral Elementary School
- June 18, 2025, in Orosi PUD at Orosi High School
- August 27, 2025, in Cutler PUD at Cutler Elementary School

The final meeting of the current series is scheduled for December 9, 2025, in Monson at Monson Elementary School.

The initial community workshop in February occurred immediately prior to the completion of the Draft Feasibility Study. The meeting provided the boards and community members with background to the project and framed the project as an opportunity to strengthen all 7 communities with a regional water solution. SWRCB and P&P staff outlined what information and alternatives were being examined in the Study, discussed the existing groundwater supplies, considerations that would determine the feasibility of utilizing surface water, affordability considerations, and a discussion of Governance.

In general, there was a strong commitment to improving drinking water access across the region and interest in collaboration between all local water districts. There were concerns raised that a regional project could delay or affect local projects underway. Questions were raised related to funding criteria and ultimate affordability. There was a desire to continue conversations regarding how decisions would be made and governance.

Each Alternative provides benefits of increasing resiliency by linking the communities together to share the water infrastructure and resources of the region. Each would reduce operational costs by removing wells and tanks that would be surplus to requirements. Operating as an independent special district would further reduce the administrative costs of operating separate water systems and spread those costs over the combined population. The costs per connection presented are reflective of a sustainable system, including capital replacement costs over the lifespan of the infrastructure. Most of the communities appear poorly placed financially to support replacement of existing wells and pipelines that are near the end of their useful life. This is evidence by the amount of funding assistance expended in the region through DFA, which does not include other funding sources such as DWR or USDA that have also contributed to the region.

Alternatives 2 and 3 add surface water supply to the region. The primary benefits of surface water to the communities would be firstly providing a secondary source of supply and secondly reducing the pumping of groundwater permitting aquifer recharge to occur. The drawbacks to surface water is the costs both to purchase and treat the water prior to use, and potential interruption of supply in dry years. In these dry years Alternative 2 retains sufficient existing groundwater supply infrastructure to cover any shortfall due to supply or costs of water purchase.

9.1 SELECTION OF ALTERNATIVE

Through the various community meetings and Board meetings, the districts have made it clear that they want a project that will provide long-term, sustainable, and affordable water.

The May meeting presented the Alternatives to the attending members of the communities and the represented Boards. SAFER staff provided a technical overview of current challenges and ongoing projects in the region. Discussion of Alternatives led generally to a consensus that Alternative 2 was preferred as a balance between reliance on groundwater in Alternative 1 and reliance on surface water deliveries. The potential purchase costs of surface water, in addition to the treatment plant operating costs remain a concern to community members and boards. Given that the amount of surface water required by the project would be a pre-requisite to discussing purchase of surface water with either AID or an FKC contractor, along with place of use considerations determined by which communities are electing to proceed with a project, the first step is selection of an Alternative.

It was further outlined in the May meeting that a competitive funding application would address primary maximum contaminant levels, include a sustainable governance structure, and demonstrate a sustainable operations and maintenance plan, supported by an adopted water rate structure. Inclusion of small communities together with consolidation of communities to keep the cost per connection of both the capital project and water rates low on a per customer basis is likely to be essential.

To move forward the existing water systems will need to examine the need for a project, potential advantages and disadvantages of each Alternative, and make a formal commitment to proceed with a selected Alternative. The technical feasibility, financial sustainability, and long-term operational resilience of the Alternatives remain highly dependent on the participation of the whole region. A re-evaluation of the selected alternative would likely be required should agreement not be reached between the existing boards on a single preferred Alternative. SWRCB has requested submission of a preferred Alternative from each board by December 19, 2025.

9.2 SELECTION OF GOVERNANCE

The June meeting focused on Governance. It was previously outlined in the May meeting that a sustainable governance structure would be vital to a successful regionalization project. The SWRCB has requested submission of a draft Governance Term Sheet, developed jointly by all water systems, by December 19, 2025. While exit polls from the June meeting, hosted by Orosi, favored a JPA the SWRCB has expressed that fragmented or temporary governance arrangements present long-term risks to operational stability, financial integrity, and equitable service delivery, particularly for small or disadvantaged communities. SWRCB has recommended that any governance proposal included in the draft Governance Term Sheet be a single, unified, independent special district.

9.3 AFFORDABILITY AND RATE STRUCTURE

As expressed in the community workshops, affordability and rate structure remain inseparable from Alternative selection and governance structure. This Study makes use of historical data in determining the potential cost of surface water; however it is incumbent on the selected governance structure to reach an agreement with a surface water supplier and ultimately negotiate a surface water agreement.

A full water rate study would be a necessary component of any selected project along with adoption of new water rates by the governing body on completion of a Proposition 218 process. For a surface water alternative, completion of the rate study would require an agreement with a surface water supplier that includes costs of raw water deliveries to the proposed plant and a firm commitment to supply the project.

9.4 NEXT STEPS

Next steps will be community driven and guided by Alternative selection and governance decisions made early in the project selection. Each of the next steps will require community involvement and buy-in.

The newly formed governing body would need to submit a funding application to further develop the selected alternative, complete environmental impact analysis, and subsequently prepare a construction funding application.

An outline of the necessary steps through submittal of a construction funding application is provided below:

1. Infrastructure Alternative Selection
2. Governance Selection / Governance Term Sheet development
3. Creation of governance entity that will apply for funding
   - LAFCo process including boundary maps, public hearings, election of board members
4. Governance entity completion of funding application for planning
   - Surface Water Purchase Agreement
   - Preliminary Engineering Report
   - Design Development
   - Environmental Impact Analysis
   - Proposition 218 Rate Study
5. Construction Funding Application

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