

Sacramento Regional Water Utility Collaboration Study

Activity 3 Report -

Business Case Evaluations

May 2021 - FINAL

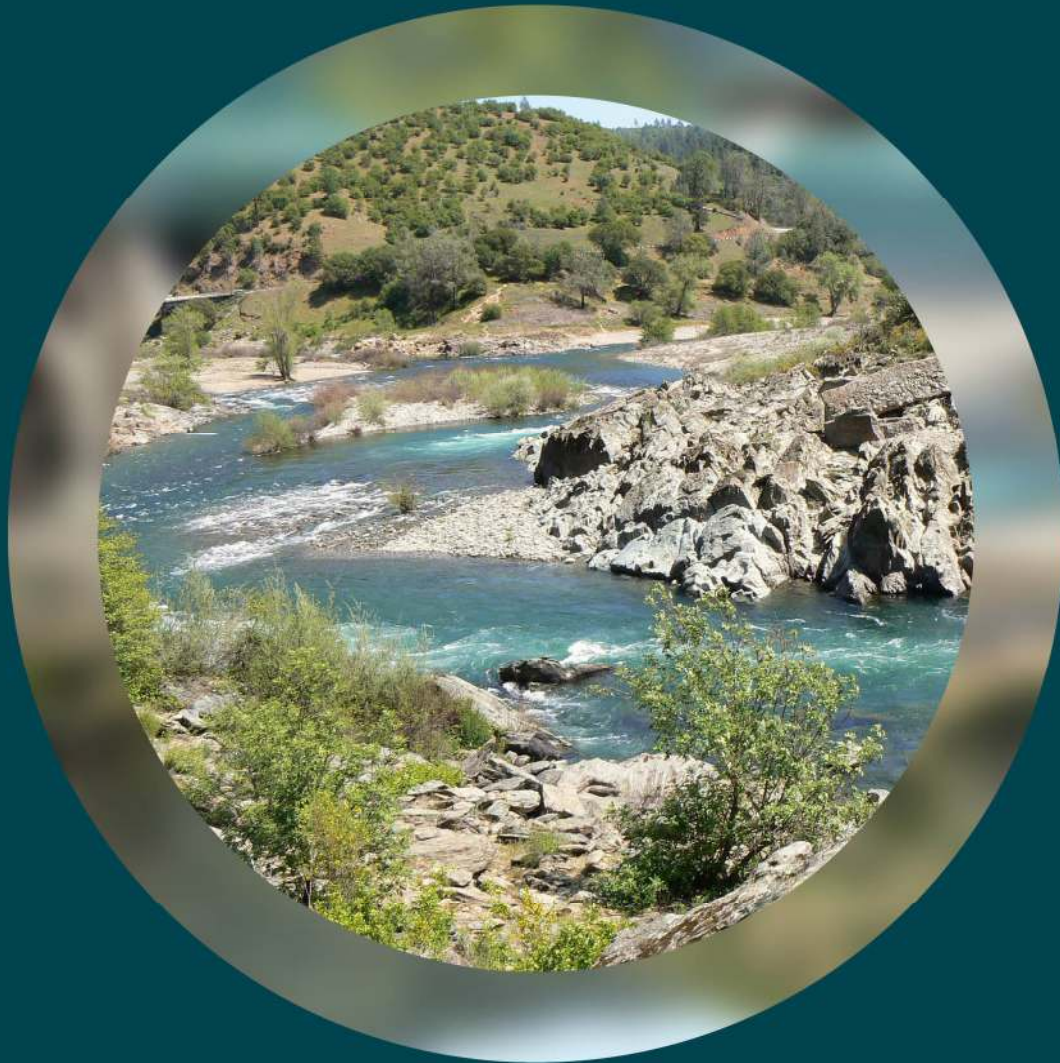


Table of Contents

Summary	5
Introduction	7
Business Case Evaluations of Selected Opportunities	8
Delivery Option Assessments.....	8
Advantages.....	9
Disadvantages	10
Risks.....	11
Stakeholder Impacts	12
Distribution System Preventative Maintenance.....	13
Delivery Options.....	13
Program Costs	18
Recommendations	20
Human Resources.....	21
Delivery Options.....	21
Program Costs	25
Recommendations	26
Leak Detection.....	27
Delivery Options.....	27
Program Costs	30
Recommendations	31
Paving	32
Delivery Options.....	32
Program Costs	35
Recommendations	35
Stand-by / Emergency Operations.....	36
Delivery Options.....	36
Program Costs	38
Recommendations	41

Water Conservation Programs	42
Delivery Options.....	42
Program Costs.....	46
Recommendations.....	50
Water Supply	51
Introduction.....	Error! Bookmark not defined.
Rationale for Water Supply Collaboration.....	51
Water Supply Collaboration Opportunities.....	53
Collaboration Methodologies.....	61
Reorganization	66

List of Tables

Table 1: Current Distribution System Preventative Maintenance Activities and Frequency	14
Table 2: Examples of PM Equipment Charge Out Costs	17
Table 3: PM Cost - Status Quo vs. Lowest Cost Comprehensive Program	19
Table 4: Current PM Program Costs - Detailed	20
Table 5: HR Services Overview	22
Table 6: Collaborative HR Cost Analysis.....	25
Table 7: Leaks and Breaks	27
Table 8: Leak Detection Cost Analysis.....	31
Table 9: Annual Paving Volume and Cost.....	33
Table 10: Paving Cost Analysis.....	35
Table 11: Annual Call Out Events	36
Table 12: Stand-By / Emergency Operations Cost Analysis	41
Table 13: Water Conservation Program Cost - Status Quo	48
Table 14: Current Water Conservation Program Costs - Detailed	48
Table 15: Water Conservation Program Cost Estimate - Joint Contract - External	49
Table 16: Water Conservation Program Cost Example - Joint Contract - Internal	50
Table 17: Participating Agencies Water Demands and Supplies (AFY).....	Error! Bookmark not defined.
Table 18: Summary Assessment of Options, Benefits, and Reorganization Methods.....	64

List of Figures

Figure 1: Annual Preventative Maintenance Expenditure per Mile of Pipe.....	18
---	----

Figure 2: Annual Preventative Maintenance Expenditure per Mile of Pipe vs. Population per Square Mile.....	19
Figure 3: Utility FTE Served per HR FTE	23
Figure 4: Annual HR Cost per Utility FTE Served.....	25
Figure 5: Reported Non-Revenue Water Percentages	29
Figure 6: Leak Detection Costs per Mile of Pipe.....	30
Figure 7: Number of Annual Paving Work Orders	34
Figure 8: Cost per Square Foot Paved.....	35
Figure 9: Call Out Events per Year and Staff Levels Required	37
Figure 10: Labor and Equipment Costs Per Call Out Event.....	39
Figure 11: Staff Stand-by Weeks Per Year.....	39
Figure 12: Costs of Water Conservation Programs	47
Figure 13: Costs of Water Conservation Programming Per Capita.....	47

Appendices

Appendix A: Activity 1 Final Report.....	A
Appendix B: Activity 2 Final Report.....	B

Summary

The Sacramento Regional Water Utility Collaboration Study (Study) is a joint study among Carmichael Water District (CWD), Citrus Heights Water District (CHWD), the City of Folsom Environmental & Water Resources Department (Folsom), Del Paso Manor Water District (DPMWD), Rio Linda/Elverta Community Water District (RLECWD), Sacramento Suburban Water District (SSWD), and San Juan Water District (SJWD) (together the “participating agencies”) to identify opportunities for increased collaboration with the goal of creating additional operational and financial efficiency, and improving service provision to customers.

This document is the third of three project deliverables. It encompasses the activities for Study Activity 3 – Business Case Evaluations (BCE). In this document, Raftelis assesses a range of delivery options for seven prioritized collaboration opportunities, jointly identified by the participating agencies for study and analyzed using a BCE approach. The range of delivery options considered encompasses the current or status quo approach, which consists of each of the participating entities delivering the service independently or making their own arrangements for outside contract support, through the full spectrum of collaborative delivery options such as joint contracting, resource sharing, and consolidated delivery. The BCE approach provides an overview of the advantages and disadvantages of the delivery alternatives for each priority opportunity.

The analyses are based on data and information obtained from the participating agencies through virtual interviews with senior representatives of each participating agency, project Steering Committee sessions, and submitted documents. Where possible, the estimated financial impacts of alternatives are also evaluated.

The Activity 2 findings noted that the participating agencies take an array of approaches and deliver different levels of service for the prioritized services, resulting in significant differences in the cost of providing those services. For example, several of the participating agencies have well-developed water conservation programs, while others have no formal program. Even with the significantly different approaches and levels of services, there are commonalities. These commonalities are opportunities to study the feasibility of collaboration. Raftelis identifies and analyzes several alternative models that may provide participating agencies an opportunity to reduce costs and/or improve levels of service through collaboration.

There are major differences in the amount and types of **Distribution System Preventative Maintenance (PM)** being performed by the participating agencies. Some agencies have robust programs, while others are focused primarily on reactive maintenance. Meaningful success toward collaborative Distribution System PM activities is dependent on aligning standards of practice, methods, specifications, and training, while building trust across the participating agencies and identifying contractors that deliver high levels of service at scale. Distribution System PM cost differences are significant among the participating agencies, because of the variable delivery standards and approaches. Uniform high levels of service, compatible with industry best practices, can be achieved through scale. For example, if the participating agencies all chose to deliver similar high-level activities at the scale of the most efficient utilities in the group, it could lead to regional savings of approximately 40% per year based on reported costs per mile of pipe.

There is a collective regional **Human Resources (HR)** staffing need of at least 0.5 full-time equivalents (FTEs), above and beyond current HR staffing of 5.4 FTEs across all study participants. Agencies have specific requests for support with recruiting and training coordination, in addition to other needs. This is an opportunity to elevate service levels in a function where many are stretched thin.

Leak Detection activities fell into different cost and level of service tiers. If the region chose to focus on higher performance levels, it would lead to an increase in direct expenses of about \$114,369. These expenditures would presumably be offset through savings in pumping, treatment, water distribution, and other costs. In this scenario, there is an assumed joint contract rate savings estimated at 10%. If the region chose to focus on lower performance levels and lower costs, a total annual decrease in direct costs for the region of \$145,226 could be achieved assuming 10% savings from joint contracting. Of course, the lower service levels could ultimately mean higher pumping, treatment, and water distribution costs, because of excess water loss. Note that new remote leak detection technologies may further drive down costs over time and are now coming to market.

A joint **Paving** contract at the most favorable observed pricing could save the region up to \$110,000 a year or about 15% off current costs. Sacramento County has also offered support on paving for some agencies, which has come with a range of benefits including reduced inspection costs and less administrative effort in addition to being cost competitive.

Stand-by / Emergency Operations activities are a greater burden for staff at some agencies relative to others. While cost reporting may require refinement, opportunities for agencies with more staff to support those with less, particularly if combined with investments in answering service technologies appears to be a sensible way to improve the management of overtime deployment regionally.

Water Conservation programming investments are highly dependent on the level of service and goals that each agency seeks. This is an activity where the priorities of each agency impact the collaborative approach. If all the participating agencies invested in water conservation activities at the same cost per capita as the City of Folsom, for example, regional costs would increase by nearly \$1.2 million per year. Presumably, this would produce proportional benefits with some adjustments to water rate structures and water supply practices.

A future **Water Supply** surplus of 212,720 acre feet per year (AFY) is estimated. A range of opportunities exist to optimize surface and ground water supplies and to monetize this surplus. Most of these opportunities can be achieved via collaborative agreements. Maximizing the value of this surplus and realizing associated benefits is quite complex, and requires negotiating the intricacies of California water laws, rules, and practices.

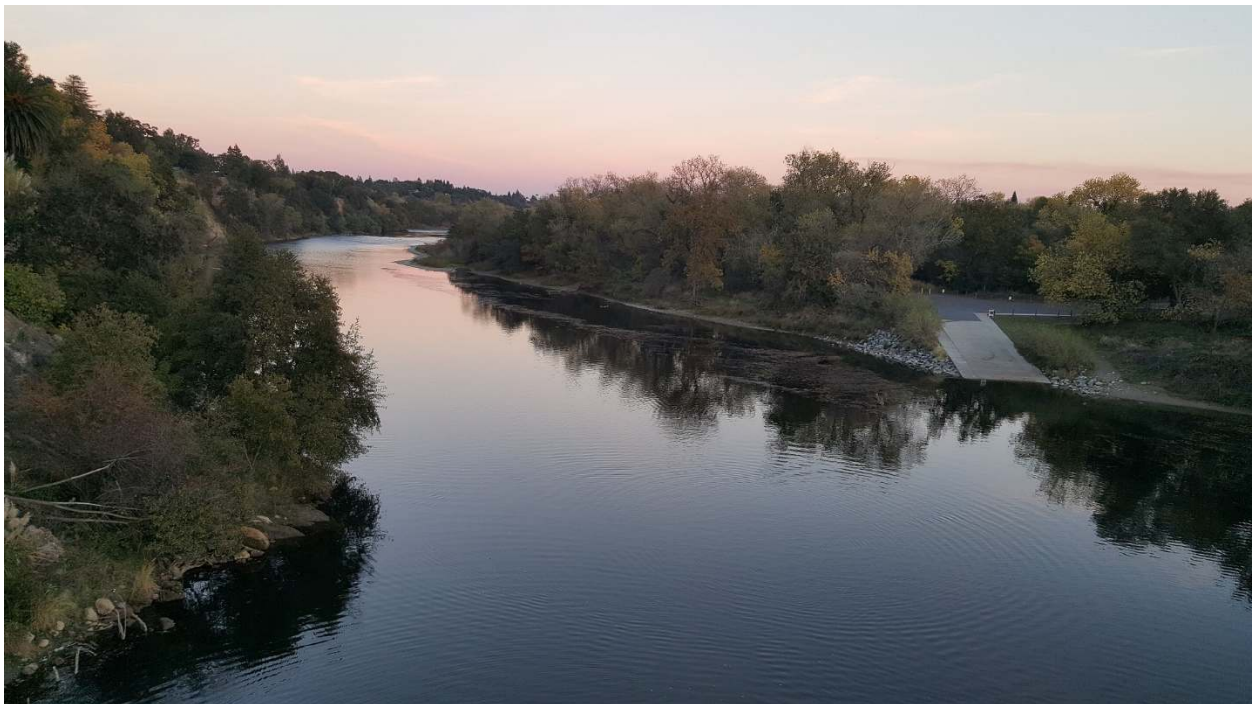
Information developed through the analysis of prioritized opportunities and the other study activities allowed Raftelis to consider the advantages and disadvantages of all types of collaboration, including reorganization; that is, two or more of the participating agencies consolidating into a single agency. It is believed that reorganization can offer significant financial and service level benefits to the region, but it must be acknowledged that it also can lead to less local autonomy and self-determination. The path to the broadest and most broadly accepted reorganization opportunities begin with realizing incremental success such as aligning practices and collaborative contracting for services. Moving down the collaborative path does not inherently commit any of the participating agencies to full reorganization, but it does allow time for agencies to align practices, acclimatize stakeholders, and put in place agreements necessary for additional collaborative activities.

Introduction

The Sacramento Regional Water Utility Collaboration Study (Study) is a collaboration among CWD, CHWD, Folsom, DPMWD, RLECWD, SSWD, and SJWD (together the “participating agencies”) to identify opportunities for increased collaboration. The goals of this Study are to identify opportunities for additional efficiency and to improve service provision to customers. Increasing costs of living, evolving regulations, and additional competition for scarce water resources across California mean that agencies may have opportunities to work together, more seamlessly and regionally, to provide reliable and affordable services.

Activity 2 findings (see Appendix B) noted that an array of approaches and levels of service are pursued by the participating agencies for the prioritized services, resulting in different costs of service. Even with the differing approaches and levels of services provided by the participating agencies, there are commonalities. These commonalities are opportunities for collaboration. In this Activity 3 report we will identify and analyze several alternative models that can allow the participating agencies to achieve savings through collaboration.

Studying every aspect of each participating agency’s operation is infeasible, so Raftelis worked with the participating agencies to focus on a list of common areas that presented viable opportunities for potential collaboration. The group reviewed and narrowed a list of over 80 potential opportunities for further study. The participating agencies prioritized seven of those opportunities for investigation during a workshop on September 24, 2020. Note that while the full list of opportunities may be explored at any time by any collection of agencies, the seven priority opportunities are the focus of Activity 3 – Business Case Evaluations.



Business Case Evaluations of Selected Opportunities

Members of Steering Committee representing each of the participating agencies selected seven opportunity areas for further study. The areas selected include:

- Distribution System Preventative Maintenance
- Human Resources
- Leak Detection
- Paving
- Stand-by / Emergency Operations
- Water Conservation Programs
- Water Supply

Raftelis assessed a range of delivery options for each opportunity using a Business Case Evaluations (BCE) approach. The range of delivery options considered encompassed the current or status quo approach, which consists of each of the participating entities delivering the service independently or making their own arrangement for outside contract support, through the full spectrum of collaborative delivery options such as joint contracting and resource sharing. Consolidated delivery of the function was included in the options.

Delivery Option Assessments

Prior to the BCEs it is worth considering the delivery options attributes that can be somewhat consistent across the opportunities. The delivery options assessed include:

- Status Quo
- Joint Contract – External
- Joint Contract – Internal
- Consolidated Provision
- Outside Organization Support

The tables below compare the delivery options across four attributes. Specifically, the following attributes are evaluated at a high level for each delivery option regardless of which opportunity they are applied to:

- Advantages
- Disadvantages
- Risks
- Stakeholder impacts

Advantages

Delivery Option	Advantages
Status Quo	<ul style="list-style-type: none"> • Agencies continue to perform activities independently from other participating agencies with or without assistance from an outside contractor. • Costs and levels of service remain the same. • Greater autonomy and individual control over activities.
Joint Contract - External	<ul style="list-style-type: none"> • Agencies likely achieve higher level of service at the same or lower cost as Status Quo by joint contracting with another participating agency. • Agencies execute a joint contract with an external resource, such as a contract to conduct valve exercising at multiple agencies. This approach allows for economies of scale and higher levels of service. • Frees up resources at all agencies.
Joint Contract - Internal	<ul style="list-style-type: none"> • Agencies with underutilized resources use their internal resources to provide services to other agencies for an appropriate fee. • Agencies may find that enhanced service levels are more attainable compared with pursuing them alone. • Potential to free up multi-tasking staff for other needs, reducing contractor support needs or enhancing service levels. • Sharing of lessons learned and best practices among the agencies will increase efficiency and reduce redundancy in effort.
Consolidated Provision	<ul style="list-style-type: none"> • Opportunity to unify standards and approaches to achieve higher levels of service in some services, increase efficiency, and achieve greater economies of scale. • More consistent service delivery throughout the region. • Leverage additional resources through the consolidated entities.
Outside Organization Support	<ul style="list-style-type: none"> • If other existing local partner organizations have the capacity, scale, and experience to complete work it may be cheaper than contracting. • May create synergies by reducing idle time of local resources that are already deployed and increasing the density and scale of their work or materials purchasing. • May already be familiar with some local requirements and standards. • Reduces inspection costs and accelerates timelines. • Reduces liability. • Positive public relations element • Creates an opportunity for development of shared incentives and objectives. • Regional continuity of messaging. • Increases program service levels equitably. • Improves and expands reach of an existing resource rather than starting from scratch.

Disadvantages

Delivery Option	Disadvantages
Status Quo	<ul style="list-style-type: none"> • The agencies do not benefit from savings where there is overlap in delivery. • Economies of scale are not maximized. • Activities can only be expanded by dedicating additional resources to them. • Practices diverge and fewer opportunities for shared savings emerge. • Less consistent service delivery throughout the region.
Joint Contract - External	<ul style="list-style-type: none"> • Agencies may need to decide on common activities and practices to achieve best contract pricing. • May introduce additional complexity. • Administrative time required to manage multi-agency contract(s). • May be concerns about equity and value; each agency must get their proportional share of resources. • Less program autonomy and customization. • Resources required to manage an external contractor. • Outside contractors may not be as familiar with the quirks of each agency.
Joint Contract - Internal	<ul style="list-style-type: none"> • Agencies may need to decide on common activities and practices to achieve the highest value. • May introduce additional complexity. • Administrative time required to manage multi-agency participation. • May be concerns about equity and value; each agency must get their proportional share of resources. • Less program autonomy and customization. • Potential liability issues. • Other agencies' staff may not be as familiar with the quirks of each agency's operation and assets.
Consolidated Provision	<ul style="list-style-type: none"> • Less program autonomy and customization. • May introduce additional complexity, even more than Joint contracting models. • Requires agreements and in some cases charter/legislative changes. • Concerns about lack of control.
Outside Organization Support	<ul style="list-style-type: none"> • May be challenging to administer across municipal boundaries. • Limited to the areas outside organizations can provide support, which might not meet all the desired service levels of some of the agencies. • Agencies may need to decide on joint messaging and common activities. • Less program autonomy and customization. • May be concerns about equity and value; each agency must get their proportional share of resources.

Risks

Delivery Option	Risks
Status Quo	<ul style="list-style-type: none"> • Collaborative momentum may be lost if opportunities are not adopted. • Opportunity to improve service levels or achieve savings may be missed. • Not all staff have equal training, and local practices may continue to diverge, making future collaborative efforts work less efficiently. • Activities may not consistently be performed per industry best practices due to varying resource availability or other inconsistencies in service delivery.
Joint Contract - External	<ul style="list-style-type: none"> • The contractor provides a level of service that doesn't align with needs. • Cost-sharing agreements, and program standards may be difficult to unify. • Contractors may not perform as well as promised. • Contract disputes may occur. • Some traditional vendors may not qualify for larger joint contracts. • Concerns about lost autonomy by stakeholders.
Joint Contract - Internal	<ul style="list-style-type: none"> • Level of service provided is above or below what a given community desires. • Cost-sharing agreements and program standards may be difficult to agree to. • Agencies working outside their systems may not provide their full effort and focus. • Potential liability issues. • Resource availability may be challenging to coordinate. • Concerns about equity and lost autonomy from stakeholders.
Consolidated Provision	<ul style="list-style-type: none"> • Similar to other joint efforts. • Additional concerns about equity and lost autonomy from stakeholders.
Outside Organization Support	<ul style="list-style-type: none"> • Availability of outside organization resources may be constrained by other existing priorities. • Outside organizations may not be able to meet the needs of all desired program elements or might become overwhelmed by demand for support in new areas. • Costs of participation with outside organizations may go up. • Programmatic investments with the outside organization may not achieve desired results due to poor execution, resource limitations, lack of training, more diffused accountability, or other factors.

Stakeholder Impacts

Delivery Option	Stakeholder Impacts
Status Quo	<ul style="list-style-type: none"> • This option is the status quo so there is no change in stakeholder impact.
Joint Contract - External	<ul style="list-style-type: none"> • Potential higher service levels achieved or lower costs, increasing stakeholder satisfaction. • There could be positive feedback associated with the cost savings and service level improvements that joint contracts could offer. • More uniform costs and service experiences across the region • Stakeholders may be suspicious of contract terms or expenditures and have varied perceptions of equity • Staff may resist changes or reductions in procedural flexibility that come with jointly bid contracts.
Joint Contract - Internal	<ul style="list-style-type: none"> • Potential higher service levels achieved or lower costs, increasing stakeholder satisfaction. • There could be positive feedback associated with the cost savings and service level improvements that sharing resources could offer. • More uniform costs and service experiences across the region • Stakeholders may be suspicious of or scrutinize investments in central shared resources. • Staff may resist changes or reductions in procedural flexibility that come with centralization of these functions.
Consolidated Provision	<ul style="list-style-type: none"> • Potential higher service levels achieved or lower costs, increasing stakeholder satisfaction. • There could be positive feedback associated with the cost savings and service level improvement. • More uniform costs and service experiences across the region • Stakeholders may be suspicious of consolidation terms and equity - perception of loss of local control • Stakeholders may resist changes. • Staffing impacts.
Outside Organization Support	<ul style="list-style-type: none"> • Could create political challenges if constituents feel it has negative employment impacts. • RWA may require additional staff or financial resources to achieve regional desires and would have to be willing to take this on. • There could be positive feedback associated with the cost savings and service level improvements that sharing resources could offer.

The sections that follow cover each opportunity and are arranged in alphabetical order as there is no preference given to the opportunity priorities until the participating agencies decide on immediate next steps following this Study.

Distribution System Preventative Maintenance

Distribution system preventative maintenance (PM) is the collection of planned and scheduled activities employed to maintain a water system's distribution network with the goal of increasing its longevity, lowering lifecycle operating costs, and providing service to customers. Activities such as proactive valve exercising, regular hydrant maintenance, and periodic water main flushing are considered typical distribution system PM activities. Note that capital replacement and repair, customer leak response, and other reactive efforts were not the focus of this review, because they are not considered PM activities. Robust PM programs have dedicated staff employing industry best practices to achieve outcomes measured by metrics and aligned with service level targets.

Differing resource levels, priorities, and attitudes are primary drivers of varying distribution system PM activity levels among the participating agencies. Similar to broader asset management programs that may include capital investment and repairs, PM practices often correlate with the number of assets and their location, age, condition, and criticality. Historical practices strongly influence chosen PM activities.

PM is often neglected because of competing priorities and because its benefits are often less apparent in the short term. You might say this is where the “rubber *does not* hit the road” for the “out of sight, out of mind” conundrum that is buried infrastructure. The participating agencies have identified the possibility of collaborative action as a way to overcome the varied stresses placed on achieving desired PM levels.

There are many collaborative opportunities for PM ranging from equipment and staff sharing to communicating lessons learned. For example, to facilitate future opportunities for more comprehensive or indeed collaborative PM programs, DPMWD may gain insights from SSWD's efforts to relocate assets from backyards to streets or to improve access for those assets that remain outside of the public right of way. Some participating agencies have recently begun to engage in contracting to meet PM objectives, while others might not yet have seriously considered such an approach. There are opportunities to do more through a collaborative scale contract with attractive rates per mile of pipe or per asset compared to what might be offered otherwise.

Delivery Options

Participating agencies have four options to provide distribution system PM, as follows:

1. Status Quo (Plus)
2. Joint Contract - External
3. Joint Contract - Internal
4. Consolidated Provision

These four options are described further in the sections that follow.

Status Quo Plus

All the participating agencies report active PM programs with varied levels of activity. Interviews and reporting noted areas of focus on PM covered eight key activities:

- Infrastructure PM / inspection (general PM / other)

- Dead-end or distribution system flushing in areas supplied with groundwater when quality issues arise
- Hydrant maintenance / painting / flushing / greasing / inspecting
- System-wide flushing
- Valve exercising (mainline, blow off, hydrant valve, air release valve (ARV) / combination air valve (CAV), etc.)
- Tank / storage reservoir inspections
- Large meter testing
- Cathodic protection program

PM work is now accomplished through a range of approaches that include dedicated staff time and contract support. In particular, SJWD employs contractor support for hydrant maintenance and valve exercising. However, even if the status quo is largely maintained in terms of staffing or contracting, there are opportunities for collaborative engagement to share lessons learned that will be detailed in this section, which is why it is referred to as “Status Quo Plus”.

The activities and frequency for PM work currently vary by participating agency as detailed in Table 1. The larger agencies report covering more PM activities, with SSWD having reported the most comprehensive program. Taken together the participating agencies spend about \$2.84 million on PM activities annually.

Table 1: Current Distribution System Preventative Maintenance Activities and Frequency¹

Activities	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Infrastructure preventative maintenance / inspection (general PM / other)	X	X	X	X	X	X	X
Dead-end or distribution system flushing in areas supplied by groundwater area when quality issue	X	X	X			X	X
Hydrant maintenance / painting / flushing / greasing / inspecting ¹	X (N/A)	X (7.2)	X (5)	X (1)	X (3)	X (5)	X (5)
System-wide flushing			X		X		
Valve exercising (mainline, blow off, hydrant valve, ARV/CAV) ¹	X (N/A)	X (11.9)	X (5)	(N/A)	X (3)	X (5)	X (5)

¹The frequency interval in years for system-wide coverage for a given PM activity is shown in Table 1 in parentheses for each participating agency.

Activities	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Tank / storage reservoir inspections			X			X	
Large meter testing			X			X	X
Cathodic protection program						X	X

While the number of assets in larger systems may make PM frequency intervals longer for activities like hydrant maintenance or valve exercising without additional resources, other considerations such as access issues, such as is the case with DPMWD, constrains the regular systematic completion of some activities entirely. However, the challenge of buried infrastructure on private property in the DPMWD system presents an opportunity, as some communities have worked through these same challenges. Specifically, CHWD and SSWD indicated that they have moved linear infrastructure from backyards into the public right-of-way, which allows for regular PM work. DPMWD can reach out to CHWD or SSWD to learn from their experiences as they seek to navigate the political and infrastructure challenges of relocating water assets that are currently less accessible.

Another opportunity for some collaboration under the status quo exists around flushing activities. CWD is developing a system-wide flushing plan. That process presents an opportunity to learn what others are doing and to share plans to ensure best practices and lessons learned are communicated.

While the Status Quo represents no change from current practices, the sharing of lessons learned and best practices as discussed here, can actually be employed with relatively little effort under any collaborative model alternative and for any of the priority opportunities discussed in this report. Achieving Status Quo (Plus) level collaboration requires ongoing regional communication and represents the best of what the region already does to achieve collective continuous improvement, whether through the Regional Water Authority (RWA) or proactive engagement by the participating agencies and the broader region. Facilitative tools such as an online library, email list, or regular meetings can help “grease-the-wheels” of collaboration under what would otherwise be Status Quo operational models.

Joint Contract - External

PM activities can be contracted to an external party to accelerate system-wide PM frequencies, expand reach where staff resources are constrained, leverage the efficiency of firms with specialized expertise or equipment, or save money on activities where full-time year-round staffing is not cost justified. While none of these benefits are guaranteed, they represent possible outcomes that are worth exploring should agencies seek to ramp up their PM activity from current levels or potentially save money through economies of scale. It is important to note that several agencies indicated that many PM activities are dependent upon the expertise and asset familiarity of in-house staff and therefore PM may not be an area where joint contracting is preferable (whether with a third party or another agency).

An Information Clearinghouse is a tool to increase data sharing among the participating agencies. We discuss it further after briefly presenting each option. It may enable more opportunities for joint contracting by allowing agencies to begin sharing upcoming contract procurements with each other more actively.

Joint Contract - Internal

An internal joint contract, where one or more agencies perform PM activities for other agencies, could take a range of forms. Under this opportunity we are referring to any agreement beyond existing Mutual Aid and joint purchasing that would allow for arrangements such as equipment sharing and cost recovery, joint equipment purchasing and sharing, joint materials and supplies purchasing, shared staff resources, or services provided by one agency for another on a contract basis.

Mutual Aid Assistance agreements that currently exist between the participating agencies provide the opportunity to tap into potential services including sharing of equipment with operator, sharing of materials, and use of facilities and personnel as needed to maintain the required services of each agency. However, more intensive, or extended arrangements outside of emergency situations have generally been handled through separate agreements outside of Mutual Aid, such as the recent support of DPMWD by SSWD, which included broad field operations responsibilities due to staff turnover at DPMWD.

The participating agencies indicated that differences in standard operating practices (SOPs), installed asset types, associated materials and supplies, and equipment requirements can make collaborative PM opportunities challenging. Working to these differences across agencies is one way to facilitate collaborative action moving forward. If the participating agencies identify, agree to, and pursue PM best practices, as well as align activity frequency intervals in a coordinated fashion, and simultaneously identify preferred materials as a group, there may be significant opportunities to reduce costs. Such alignment of SOPs, assets, and materials, when coupled with joint training (to be discussed in the Human Resources section), could help to alleviate anxieties about more intensive staff sharing.

Consolidated Provision

A consolidated approach would likely look very similar to an intense Joint Contract – Internal approach where one or more agencies is responsible for PM across multiple participating agencies in one or more areas such as treatment or distribution system operations and maintenance. A consolidated approach would require alignment of SOPs, policies, and standards in the chosen areas. It would also encourage a more rapid move toward standardization of assets. Ownership of the assets could stay with each participating agency or could be leased or sold to another entity. There are many examples in the utility industry where one utility operates and maintains the assets of another utility under some type of agreement.

A consolidated approach requires complex planning and legal considerations; therefore, it may not be the best first step toward collaboration. Rather, building on relationships and practices developed through a joint contracting approach seems to be a better starting point for collaboration.

An assessment of the range of inter-agency opportunities for collaboration on PM would ideally include a bottom-up cost analysis at an operating expense budget line-item level. Below we present range of service level options for each element of PM collaboration and rough costs where applicable and where data was available.

Formally sharing SOPs, supplies, materials, and equipment inventory, as well as activity schedules through an Information Clearinghouse:

Setting up an Information Clearinghouse can be accomplished without significant additional costs using widely available technologies. Microsoft Office 365 includes cloud-based tools called SharePoint and OneDrive that can be setup to allow file sharing through folders accessible by permitted users from outside organizations using the same Microsoft login that grants access to each person's work computer. Other free or low-cost tools depending on the amount of storage and features needed include Dropbox, Google Drive, and Box.

Equipment sharing, purchasing, and cost recovery:

Equipment idle time is an opportunity cost that can be monetized. The challenges of equipment sharing include concerns about availability, asset longevity, wear and tear, and liability, and yet agencies around the country and in the Sacramento Region already occasionally share equipment, suggesting that these challenges can be overcome. Given this, it may be worth considering whether there are opportunities to formalize and expand the opportunities to share equipment among the participating agencies, or even purchase new equipment that might not be cost justified individually but would be if pursued together.

Table 2 provides example charge out rates for certain equipment provided by select participating agencies. These rates may be negotiable depending on the terms and duration of use.

Table 2: Examples of PM Equipment Charge Out Costs

Agency	PM Equipment
CWD	Vehicle charge out rate is \$55 per hour plus 15% administrative fee
CHWD	Equipment is charged out at \$156 per hour. ²
Folsom	Not captured or not applicable
DPMWD	Not captured or not applicable
RLECWD	Not captured or not applicable
SSWD	Not captured or not applicable ³
SJWD	Not captured or not applicable

Joint materials and supplies purchasing:

While data specific to PM materials and supplies is challenging to isolate, there may be a range of these expenses that could be shared for PM activities. The success of the joint chemical purchasing program that some participating agencies are involved with was highlighted as a cost saver and a model that could be expanded. PM related materials and supplies may include PPE, IT hardware,

² For the purposes of the PM analysis total equipment charge out was estimated at 20 hours per week for the entire year (52 weeks), or \$162,240 per year. CHWD did not provide a description of what this equipment is but noted a \$156/hour charge out rate for equipment used in PM.

³ SSWD noted 1 Distribution PM Truck #64 with an average annual cost since 2014 of \$9,035, and a valve exerciser with an average annual cost since 2009 of \$8,440. Charge out costs per hour were not provided.

tools, paint, testing supplies, safety cones, and any other field staff sundries that can be inventoried, warehoused, and purchased jointly to achieve savings.

Services provided by one agency for another on a contract basis or investments in shared staff:

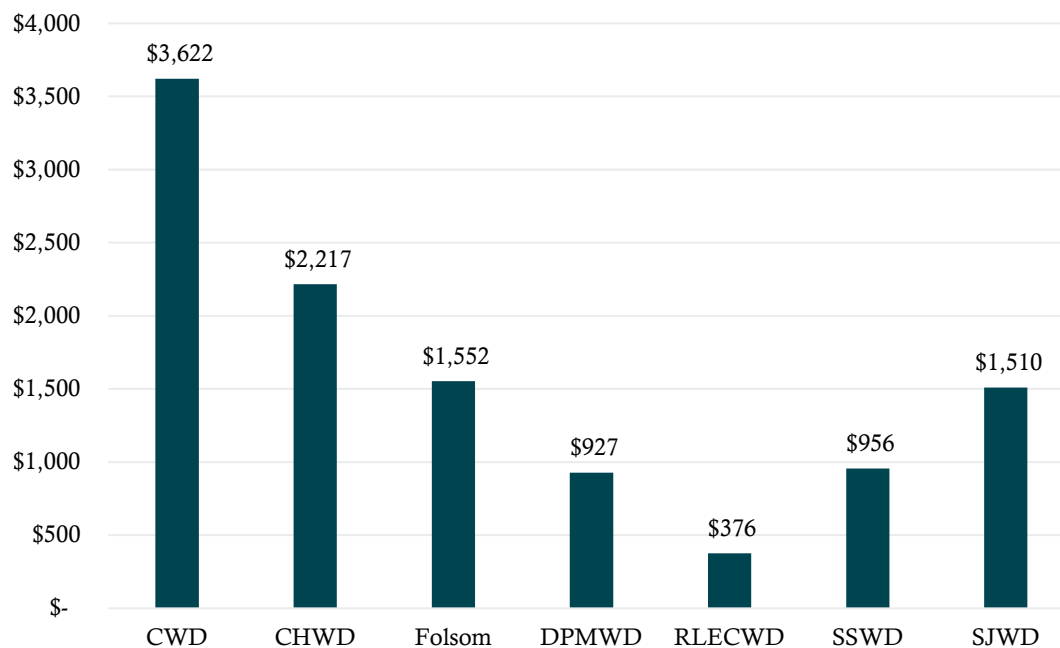
Should agencies with stretched resources fall behind on PM goals, utilities with additional resources may be able to offer contract PM (or other services) support in an arrangement similar to the recent one between SSWD and DPMWD for operational support during a period of high staff turnover. This alternative presents a revenue opportunity for the providing agency, while potentially reducing full time and longer term staffing cost commitments for the contracting agency. As with several collaborative models, hesitance about having outside staff work across systems may be overcome by aligning SOPs, materials, and training and by working to maximize service provider accountability through sound agreements that ensure the scope of the activities is completed to expectations.

If existing staff levels are insufficient to allow for inter-agency PM staffing, a cost sharing arrangement could be developed for new regionally resourced staff positions. Creating such a position would likely not be an immediate first step but perhaps a future option as SOPs and cross-training expands and agreements subsequently developed. The need for shared resource might be considered if agencies seek to expand their PM service levels or as staffing changes create gaps in available resources across agencies.

Program Costs

Among the three agencies that indicated they are doing the most comprehensive PM activities, the one with the lowest cost on a per mile of pipe basis is SSWD per Figure 1.

Figure 1: Annual Preventative Maintenance Expenditure per Mile of Pipe



While some agencies have noted that costs in less densely populated communities may be inherently higher because more infrastructure is required per unit of area and population served, a basic correlation analysis does not clearly bear this out. Figure 2 reveals that annual preventative maintenance expenditure per mile of pipe and population per square mile have an R² coefficient of determination of just 0.23, suggesting little correlation between these two statistics among the participating agencies.

Therefore, it is worth looking at the potential for PM savings that could be achieved by servicing all participants at the cost and activity level of SSWD, which is the agency providing the greatest coverage at the lowest cost, or \$956 per mile of pipe. This would translate to an estimated cost of about \$1.7 million per year or a savings of over \$1 million, a more than 38% cost reduction. While there may be a desire to scrutinize and refine included costs in future study of this opportunity to ensure alignment, the analysis suggests significant savings can be achieved through PM collaboration.

Figure 2: Annual Preventative Maintenance Expenditure per Mile of Pipe vs. Population per Square Mile

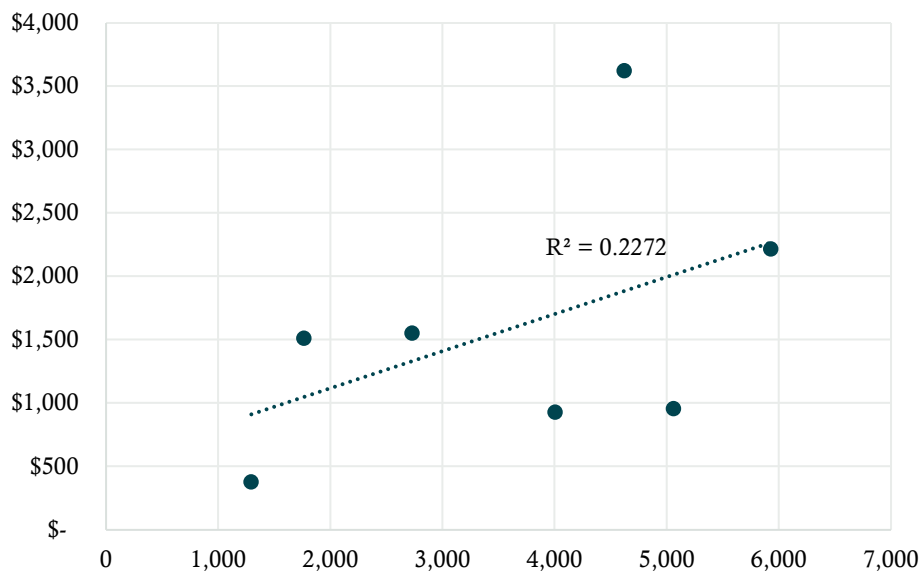


Table 3: PM Cost - Status Quo vs. Lowest Cost Comprehensive Program

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Total Estimated Annual PM Cost	\$579,528	\$553,280	\$569,565	\$19,463	\$23,542	\$667,475	\$335,219
High level of service - Total PM programming cost at \$956 per mile of pipe	\$153,003	\$238,684	\$350,950	\$20,082	\$59,920	\$667,475	\$212,291
Difference in programming cost	\$(426,525)	\$(314,596)	\$(218,614)	\$619	\$36,378	\$-	\$(122,928)

Table 4: Current PM Program Costs - Detailed

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
PM FTE*	8.63	3.00	4.50	0.02	0.31	5.00	2.20
Total FTE Costs	\$579,528	\$391,040	\$569,565	\$19,463	\$23,542	\$650,000	\$249,327
Equipment Costs**	Unknown	\$162,240	Unknown	Unknown	Unknown	\$17,475	Unknown
Contract Costs	None	None	\$0	None	None	None	\$85,893
Materials, Supplies, and Other Costs	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

*Includes administrative support allocation to PM FTE where information was provided.

**It is expected that there may be additional reporting needs here in future efforts to account for vehicles if not other relevant equipment as well as discrepancies in the manner of reporting for the two equipment costs that were provided or able to be estimated

The available information suggests that agencies seeking to leverage contractors to expand the reach of their PM activities have found that up to 26% (SJWD) of this work can be contracted out. If all agencies contracted at this level and we assume a 10% savings can be achieved through a joint contract, the 10-year savings achieved through joint contracting would be about \$714,498. While this may represent a small financial savings, it could come with other benefits such as improved service reliability, longer asset life, fewer asset failures, or even perhaps staff reductions that could be achieved through attrition.

Recommendations

In order to achieve potentially higher and more uniform levels of service, as well as optimize PM services and resourcing for all of the participating agencies, a phased approach to collaborative action is recommended as follows:

1. Keep data on costs and service provision to support analysis of the pros and cons of collaborative service delivery approaches. Discuss this information with stakeholders to raise awareness.
2. Develop an Information Clearinghouse to share SOPs, materials and supplies inventories, specialized equipment inventories, contract procurements, and best practices.
3. Move toward aligned SOPs, assets, practices, policies, etc.
4. For agencies seeking to increase PM activity levels now, discuss SJWD's contractor experiences to learn what their experience has been. Ultimately a joint bid may become more appealing to those currently hesitant to allowing outsiders to work on their assets.

5. As SOPs, best practices, materials and supplies, and asset types converge over time, consider inter-agency resource contracting, or shared regional resources and associated agreements.
6. If inter-agency resource contracting or provision through shared regional resources is efficient, beneficial, and equitable to all parties, consider consolidated service provision of activity.

Human Resources

Human resources (HR) functions were prioritized because several of the participating agencies noted gaps in their respective HR capacity to cover the full range of activities demanded. Larger agencies with dedicated staff find that their greater headcounts demand one or more dedicated HR positions. Smaller agencies do not have dedicated HR staff, thereby requiring managers or other staff to shoulder this burden along with other job duties. Given the broad array of activities that HR covers, the participating agencies identified HR collaboration as an opportunity. All agencies have some internal capabilities, and a few agencies hire external contractors to fill in the gaps in services provided.

Delivery Options

Participating agencies have four options to provide HR functions, as follows:

1. Status Quo
2. Joint Contract External
3. Joint Contract - Internal
4. Consolidated Provision

These four options are described further in the sections that follow.

Status Quo

Table 5 provides a summary of the status quo for HR services across the participating agencies. Under the status quo, HR service levels vary less by preference than by resource availability. Some agencies do not have any full time HR staff. Despite the divergence in resourcing there is quite a bit of alignment on a set of gaps and opportunities identified by the participating agencies that could potentially be filled through collaboration. Common gaps include a desire to increase training coordination, share team building best practices, identify shared resources to support recruitment activities, and update policies and procedures to ensure compliance with legal obligations and best practices. Contract support is employed by some agencies to fill these gaps.

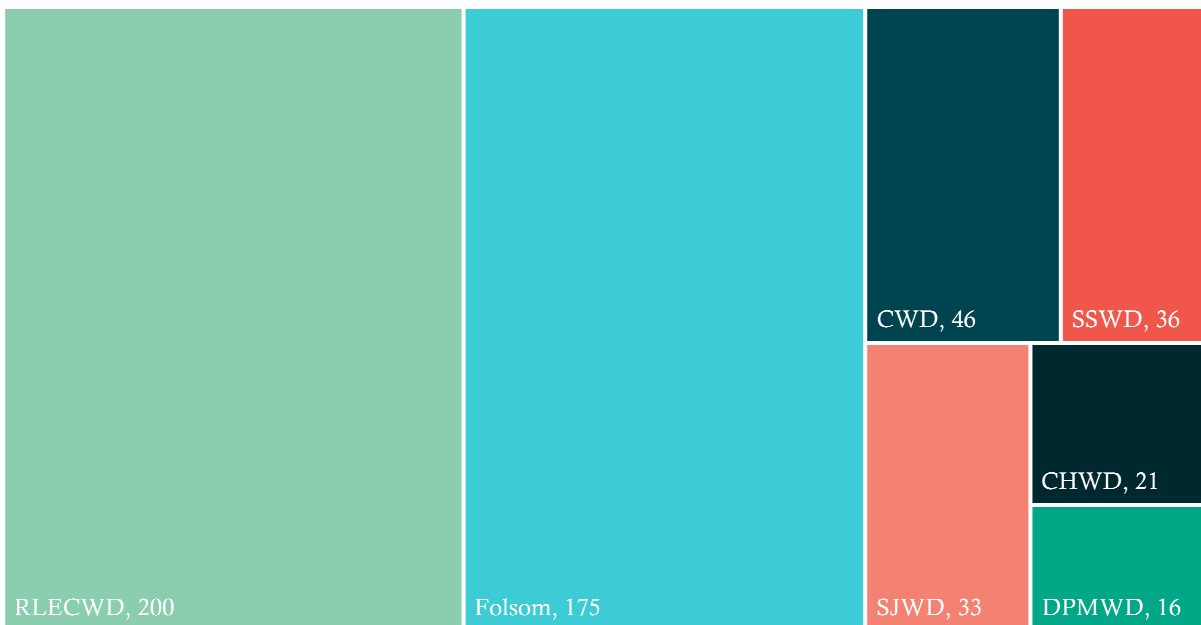
Table 5: HR Services Overview

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Total Employees	32	36	34	4	10	71	48
HR FTE	0.7	1.75	0.2	0.25	0.05	2	1.45
HR Services Offered	Comprehensive (less gaps)	Comprehensive (less gaps)	Comprehensive	Comprehensive (less gaps)	Comprehensive (less gaps)	Comprehensive (less gaps) also have training facility	Comprehensive (less gaps)
Reported HR Service Gaps or Opportunities	Staff morale building, training coordination	Training coordination	None Reported	None Reported	GM provides the HR services	Training and recruitment, updating policies/ procedures and Employee Handbooks	Recruitment and selection, non-technical staff development, training and team building, performance management and employee coaching/discipline, culture building, keeping abreast of labor laws.
Contract Services	None	None	None	None	None	Employee Benefits Insurance Brokerage and Consulting Firm (EPIC) ⁴ , Bryce Consulting	Bryce Consulting, Meyers Fozi, LLP

⁴ Though EPIC doesn't assist with staffing per se, they do provide a research and data analysis service that HR staff would otherwise need to undertake OR engage another consultant. Management Partners is another contractor that was used for HR support but is not listed as that was a one-time service.

To normalize the number of HR related FTEs at each of the agencies, the number of utility FTE served by one HR FTE was calculated and shown in Figure 3. RLECWD and Folsom stand out among the participating agencies because the General Manager provides HR services as a portion of his duties at RLECWD and Folsom is supported by the efficiencies of broader City functions. In the case of RLECWD, the agency has 10 FTEs but the time spent on HR is the equivalent of one full-time HR employee supporting 200 full-time employees. It is important to note that because Folsom is supported by the shared HR department in the City; this agency is unlikely to support the other agencies with HR resource sharing.

Figure 3: Utility FTE Served per HR FTE



Joint Contract - External

SSWD contracts HR service support (as needed) to supplement the work of two HR FTEs who support 71 FTEs in the agency. The supplemental work includes the following providers with some of the associated services:

- Bryce Consulting:
 - Classification analysis and job description development/revision
 - Recruitment support (review of job applications, development of oral interview questions, facilitation of oral interview, reference checks)
 - General HR support (development/revision of personnel policies, audit of personnel practices, advising managers on performance management issues)
- Employee Benefits Insurance Brokerage and Consulting Firm (EPIC)
 - Benefit renewal analysis for benefits
 - Assist with contract negotiations and renewals

SJWD contracts legal labor assistance with Meyers Fozi, LLP, and HR service support with Bryce Consulting. The support provided by Bryce Consulting includes:

- Development of job announcements
- Placement of ads
- Receipt and screening of applicants
- Development of selection materials
- Scheduling and facilitating interviews
- Maintaining contact with candidates
- Making offer to selected candidate
- Conducting reference checks

Joint Contract - Internal

An alternative to a joint external HR support, internal joint contracts might offer a shared regional resource or partial dedicated FTE with designated responsibility for filling HR service gaps across the participating agencies. Cost sharing for shared HR staff could be established through an interagency agreement with negotiated terms to ensure equitable availability (based on the terms of the agreement) and support based on each participating agencies' size and HR support needs.

In addition to filling the identified HR functional gaps, the regional HR resource could also manage an Information Clearinghouse that would facilitate other collaborative actions including but not limited to archiving training materials, scheduling collaborative team building work sessions, and a range of other knowledge sharing and data coordination activities discussed in each opportunity section of this document.

Consolidated Provision

A consolidated approach would likely look very similar to an intense Joint Contract – Internal approach where one or more agencies is responsible for select HR activities across multiple participating agencies. A consolidated approach would encourage a more rapid move toward standardization of policies, pay, job descriptions, benefits, etc. While it may be somewhat cumbersome, HR specialists could still maintain distinct attributes across multiple participating agencies. For example, each agency could still have separate job descriptions and pay scales for staff.

A consolidated approach requires complex planning and legal considerations; therefore, it may not be the best first step toward collaboration. Rather, building on relationships and practices developed through a joint contracting approach seems to be a better starting point for collaboration.

Outside Organization Support

ACWA JPIA⁵ and California JPIA⁶ both have online resources available that can continue to enhance staff training particularly during periods of remote work, especially regarding HR-related issues. These resources, available at no additional cost for members, can be further optimized and promoted through collaboration by sharing experiences on the most useful tools or any that are required, and in this way cooperating to improve the visibility of the best training resources and maintain staff compliance. Several participating agencies are already members of these organizations.⁷ Further, joint communications to these organizations may achieve greater voice through collaborative engagement

⁵ <https://www.acwa.com/resources/>

⁶ <https://cjpia.org/training/e-learning/>

⁷ Information on specifically who is a member of ACWA JPIA and JPIA was not provided by the participating agencies.

at scale to further optimize training opportunities and content to ensure its value meets needs in the Sacramento Region.

Program Costs

Total annual HR cost per utility employee is shown in Figure 4, which highlights that for agencies providing the most comprehensive services, costs appear to go down when the scale of the utility increases. This is demonstrated by SSWD, which has the lowest cost at \$3,288 of HR work per employee served among those agencies with dedicated HR staff. Note that Folsom’s HR cost per FTE served is approximately lower than SSWD but that Folsom is served by the City’s HR department, which works across all City departments. Given the benefits that Folsom enjoys through this municipal HR support, it is expected that Folsom’s role in some elements of HR collaboration may be more limited.

Figure 4: Annual HR Cost per Utility FTE Served

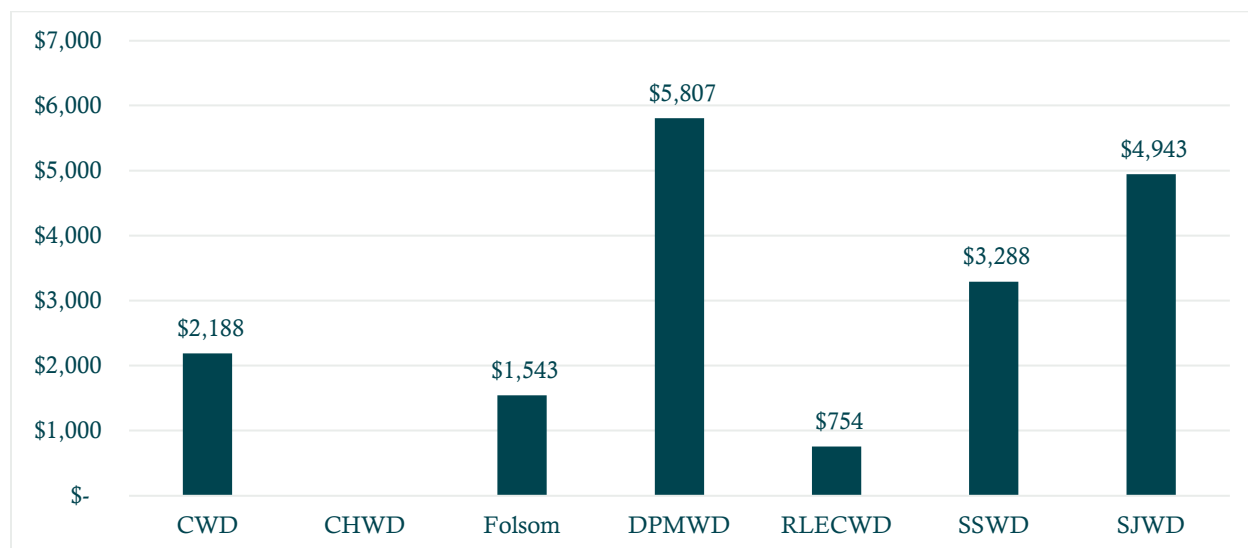


Table 6: Collaborative HR Cost Analysis

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Total HR Cost	\$70,000	Unknown	\$53,865	\$23,228	\$7,540	\$233,453	\$237,263
High level of service - Total HR programming cost at \$3,288 per FTE served	\$105,218	\$118,371	\$114,754	\$13,152	\$32,881	\$233,453	\$157,827
Difference in programming cost (line 2 minus line 1)	\$35,218	Unknown	\$60,888	\$(10,075)	\$25,341	\$-	\$(79,435)

Given that SSWD can provide a comprehensive set of HR support services at relatively low costs even while deploying contractor support to augment staff capacity, it is possible that some combination of

joint contracting (whether internal or external) might be able to expand the HR service levels of the other participating agencies. If all the agencies achieved the comprehensiveness of SSWD based on SSWD costs the group would spend an additional \$137,155 per year in HR costs (the sum of the last line in Table 6).

This possibility becomes even more enticing given that both SJWD and SSWD utilize some of the same contractors to support HR services. A joint contract with more scale or perhaps a multi-year commitment might entice a firm like Bryce Consulting to provide discounted rates for services such as recruitment, HR policy development, or general HR support. Currently, contracted HR services are 3-4% of costs for agencies that contract out a portion of services. While savings at this level of contracting might be somewhat limited even if jointly bid, the participating agencies generally reflected that their needs on HR were more about getting the necessary work of this function done than they were focused on expectations of costs savings.

Raftelis estimates that the additional HR needs of the participating agencies represents about 0.5 FTE in aggregate across all the agencies. This is based on the kinds of related services contracted out by some of the larger agencies and the estimated total annual staffing needs based on noted activity gaps and current staffing levels. A fully loaded FTE (salaries and benefits) is estimated to cost about \$150,000, which means that for a total regional cost of about \$75,000, or less than \$11,000 per year per agency a joint HR support position could be established. These costs could be distributed in to-be-negotiated weights based on the support needs of each agency and would then be billed back to each agency based on the time keeping of the joint employee. As a practical matter, this resource would likely be housed within one of the participating agencies to avoid the need to create a new entity to house the resource.

Recommendations

To accomplish the broad suite of services that comprise the HR function, the participating agencies should look at collaborative solutions. Having General Managers shoulder the myriad range of HR issues that can emerge, even for the smallest utilities, is an unsustainable practice. There is a significant risk that critical HR activities will be missed or performed inadequately. While this might not present a problem in the short-term, it is likely to present one over the longer term especially as competing demands for time and resources occur. Further, relying on the same contractors to augment services for larger utilities is less sensible than a regional, jointly bid contract that could achieve some savings, no matter how small, while also elevating the service levels of multiple agencies. What appears to make the most sense given the overlap in gaps and opportunities identified is to hire a shared regional HR resource, perhaps on a part-time basis to begin. This individual could likely add even more value to each of the participating agencies by coordinating training programs that also leverage content from outside organizations such as ACWA JPIA and California JPIA and SSWD's training facility.

Each agency should keep data on costs and service provision to support analysis of the pros and cons of collaborative service delivery approaches for HR. They should discuss this information with stakeholders to raise awareness.

Leak Detection

Leak detection, whether conducted on an ad-hoc, systematic, or reactive basis in response to leaks presents an efficiency and service-level enhancing opportunity. Whether through joint contracting or sharing equipment and staff there is a sense from the participating agencies that this area may be rife for increased collaboration. While the age, size, and even characteristics of a given service area can change the perspective of a utility with respect to the need for leak detection, when engaged in a more proactive manner it can lead to water loss reductions that can yield a range of benefits. This can be critical in periods of drought or simply to reduce wasted water, along with the associated expense.

Delivery Options

Participating agencies have four options to provide leak detection, as follows:

1. Status Quo
2. Joint Contract External
3. Joint Contract - Internal
4. Consolidated Provision

These four options are described further in the sections that follow.

Status Quo

Under the status quo, the participating agencies maintain each of their pipe networks, which total 1,780 miles. Table 7 lists the total miles of pipe, and leaks and breaks relating to service lines and mains for each agency. For further comparison, AWWA utility benchmarking provides a median of 9.2 for leaks and breaks per 100 miles of mains. CHWD, DPMWD, and RLECWD do not have system-wide leak detection programs and instead perform ad hoc leak detection only. DPMWD does not perform any regular leak detection on their 21-mile system because the pipes are in backyards. For the other agencies, the frequency of each system-wide leak detection cycle ranges from 4 to 6.4 years.

Table 7: Leaks and Breaks

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD	AWWA Median
Total system miles of pipe reported ⁸	160	249.6	367	21	62.66	698	222	-
Leaks and breaks per 100 total system miles of pipe reported (service line breaks)	59.1	35.3	31.4	53.5	121.9	10.9	36.8	-

⁸ Unable to split miles between service lines and mains

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD	AWWA Median
Leaks and breaks per 100 total system miles of pipe reported (main breaks)	27.9	4.5	0.4	11.1	4.8	7.4	1.9	9.2
Frequency of a single system-wide leak detection cycle	6.4 ⁹	N/A	4 ¹⁰	N/A	N/A	5	5	

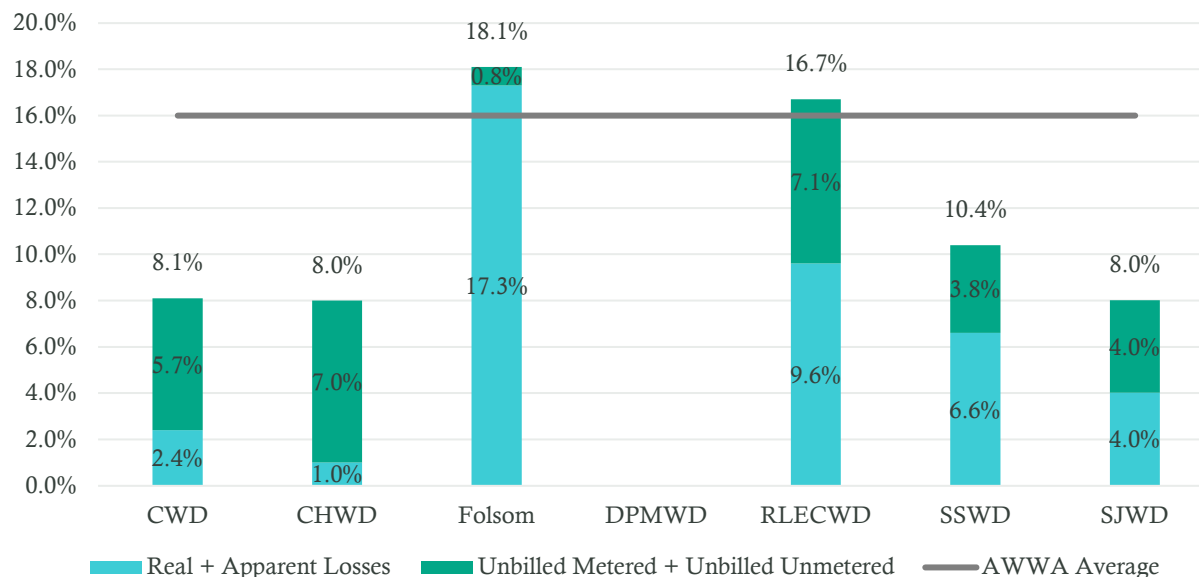
Utilities incur Real Water Losses from pipeline leakage and Apparent Water Losses when customer water consumption is not properly measured or billed.¹¹ This is considered a portion of the Non-Revenue Water at a utility. Also subsumed in Non-Revenue Water is unbilled metered usage and unbilled unmetered usage. Except for DPMWD, which solely provides unmetered service to residential customers (metered to commercial, industrial, and institutional customers), the participating agencies provided data about Non-Revenue Water. This includes the breakdown of real and apparent water losses and unbilled metered and unbilled unmetered water. Total non-revenue water losses as a percentage of total water produced is also shown in Figure 5 for the participating agencies above each stacked bar.

⁹ Goal is 3

¹⁰ Goal is 3; reality has been 3-5 based on most recent 3 rounds

¹¹ Real Water Losses and Apparent Water Losses are formally defined by AWWA in its manual M36 Water Audits and Loss Control Programs, Fourth Edition (2016).

Figure 5: Reported Non-Revenue Water Percentages



Joint Contract - External

A significant financial incentive for exploring joint third-party contract collaboration on systematic system-wide leak detection services is the ability to share in the mobilization charges that contractors charge. Joint contracts can present savings, particularly as technology advances such as airplane or satellite radar leak detection services emerge.¹² A shared contract presents opportunities for reducing labor hours, mobilization, and fuel costs, and producing scale efficiencies.

Several agencies already employ the same contractor (Utility Service Associates) to support either system-wide or ad-hoc leak detection services, thereby presenting a ready-made joint bid opportunity. In some regions and for some utilities, leak detection work may cluster during certain times of the year (often spring and fall), which can present capacity challenges for contractors. Larger contracts covering more miles of pipe may draw more competition from larger firms with the scale to meet the needs of all interested agencies in a timely fashion and at lower costs.

Joint Contract - Internal

Some agencies have more equipment or available trained staff and may therefore do more leak detection work in-house than others. However, due to the seasonality of leak detection work it may make less sense to try to provide this service collaboratively as an expansion in hired staff that might be needed. Leak detection is more often contracted out than not around the country given the evolving technology and expertise that typically specialized contractors have more experience with. To be sure, field staff are invaluable partners in this work, particularly where asset locations and GIS data are lacking. The local field staff of each agency will be most familiar with their own systems and certainly in the near term is preferable to staff from other agencies for this work. While over time intensive

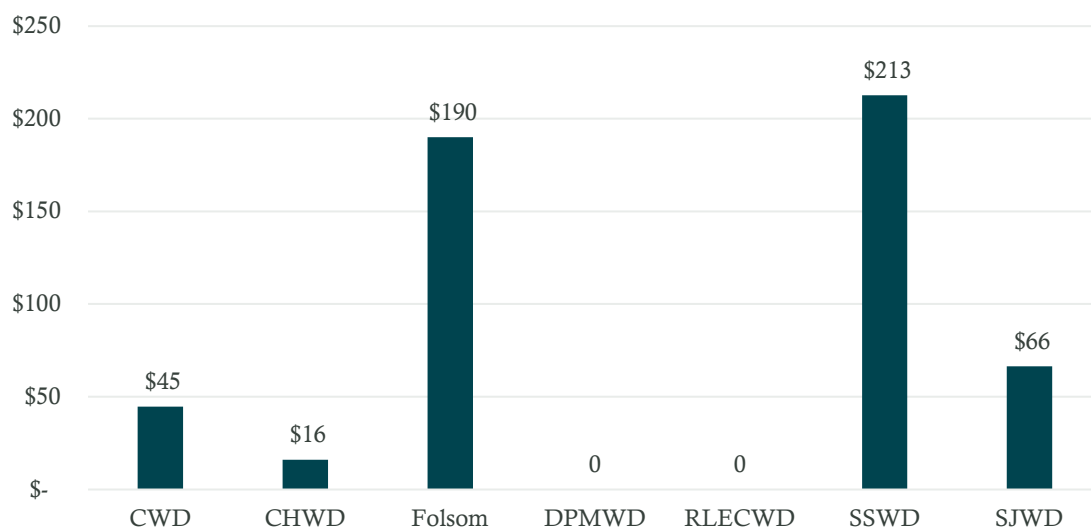
¹² <https://utiliscorp.com/>, <https://www.leakdetectionservice.com/utilis>

investments in equipment, cross-training, and broader geographic and asset familiarity could present the opportunity to scale up a regionally shared team of field leak detection staff for deployment to each agency, the pace of technological change in the leak detection space is currently hard to stay ahead of. It is possible that shared resources focused on pipe locates, or GIS technology and best management practices could make more sense than regular system-wide leak detection delivered collaboratively. While ad-hoc leak detection support could present a shared opportunity, this overlaps in part with the section focusing on after-hours emergency support collaboration.

Program Costs

The leak detection costs per total miles of system pipe reported are shown in Figure 6. CHWD, which does not have a system-wide leak detection program, has an expected lower cost per mile compared to the other agencies and indicated that most leaks come to the surface and do not require detection. DPMWD does not have any costs because they do not have regular access to lines located in backyards. RLECWD indicated that a hard pan layer typically brings leaks directly to the surface and so they almost never need to use leak detection services. Folsom and SSWD spend the most on leak detection services. CWD spends the least among agencies that conduct regular system-wide assessments.

Figure 6: Leak Detection Costs per Mile of Pipe¹³



¹³ Includes contractor costs as well as water loss audit costs, which are considered as relevant to the leak detection activity throughout the section. The audit is reflective of a higher level of service.

While some agencies that perform regular system-wide leak detection work are spending less than SSWD, SSWD was the only utility that noted that their contracted work includes pipe condition assessments and water loss audit costs. Folsom also has robust contracting and a regular commitment of in-house staff time and equipment supporting an elevated level of service for leak detection activities. CWD and SJWD, do regularly contract for leak detection work with in-house support, but appear to have more pared down services and costs. Table 8 reviews the two tiers of costs based on the average cost for the SSWD/Folsom higher level of service and the average cost for the CWD/SJWD lean approach to demonstrate the range of spending should the region expand to let joint contracts or share in-house resources. A move to the higher level of service would lead to the greatest increase for CHWD, and total annual increase in costs for the region of \$114,369. If we assume that a 10% savings can be achieved through a joint contract, the total annual savings for the region under a high level of service contract would be about \$36,000 per year. A move to the lean level of service would lead to the greatest savings for SSWD, and a total annual decrease in costs for the region of \$145,226. If we assume that a 10% savings can be achieved through a joint contract, the total annual savings for the region under a lean level of service contract would be about \$10,000 per year.

Table 8: Leak Detection Cost Analysis

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Leak detection costs per mile of pipe	\$45	\$16	\$190	N/A	N/A	\$213	\$66
High level of service - Total leak detection programming cost at \$201 per mile of pipe	\$34,013	\$53,060	\$78,017	\$4,464	\$13,320	\$148,382	\$47,193
<i>Difference in programming cost for high level of service</i>	\$26,875	\$49,060	\$8,294	\$4,464	\$13,320	\$-	\$32,471
Lean level of service – Total leak detection programming cost at \$55 per mile of pipe	\$8,874	\$13,844	\$20,355	\$1,165	\$3,475	\$38,713	\$12,313
<i>Difference in programming cost for lean level of service</i>	\$1,736	\$9,844	\$(49,368)	\$1,165	\$3,475	\$(109,669)	\$(2,409)

Recommendations

Two service level tiers emerged upon data review for leak detection with SJWD and CWD spending less and SSWD and Folsom spending more for systematic system-wide leak detection efforts. Despite this, a joint leak detection contract is recommended to achieve savings on activation costs and allow contractors to compete for a large bid with regional pipe miles. Under this joint contract it is possible that agencies could choose either a lean or high level of service if the bidders were asked to quote both models. In order to determine the appropriate next steps on leak detection several outstanding questions must be answered:

1. Among the agencies spending less on system-wide leak detection services (CWD and SJWD), are there elements of the higher cost programs (Folsom/SSWD) that would be attractive to them if collaborative savings were available through joint contracting?
2. Among the agencies that spend more on system-wide leak detection services (Folsom/SSWD), do they feel they are getting value for the significantly higher expenditure they commit to leak detection or are they keen to learn why others (CWD/SJWD) are able to spend so much less?
3. Among the agencies that do not currently perform system-wide leak detection, is there a desire and pathway to pursue a higher level of service through joint contracting, equipment sharing, or perhaps shared resources in support of line locates or contractor management?
4. Might new satellite/radar technology be a pathway to collaborative savings? Note that this technology could render the access issues in DPMWD largely irrelevant due to its remote nature.

To answer these questions the aforementioned Information Clearinghouse could be a useful tool to capture contract specifications and other leak detection documentation such as training materials and equipment inventories for programmatic comparisons that would clarify differences in current levels of service. This would provide a better sense of the reason for the observed cost differences and fodder for additional collaborative engagement prior to future opportunities for joint procurements.

In addition to joint contracting and increased information sharing, in-house staff and equipment sharing may be an option depending on the availability of each. However, during the Study we did not get a clear impression that any agency necessarily has surplus in-house availability to support others on leak detection.

In addition to contract cost reductions, overtime collaborative leak detection activities provide the potential to reduce water losses and sometimes water line failures, which translates to improvements in customer levels of service and reductions in costs.

Paving

All the participating agencies outsource their separate paving activities that follow in-street and facility repairs, replacement, new asset construction, and other pavement disturbances. Major capital projects completed by larger contractors in some cases include paving as part of the cost, or in other cases municipal partners that work on roads complete this work. Several contractors compete for the separately contracted paving work, which is our focus for this collaborative opportunity.

Delivery Options

Participating agencies have three options to provide paving activities, as follows:

1. Status Quo
2. Joint Contract - External
3. Outside Organization Support

These three options are described further in the sections that follow.

Status Quo

The participating agencies report variable per area costs and contract structures across the participating agencies. Opportunities such as joint bidding may therefore be worth exploring.

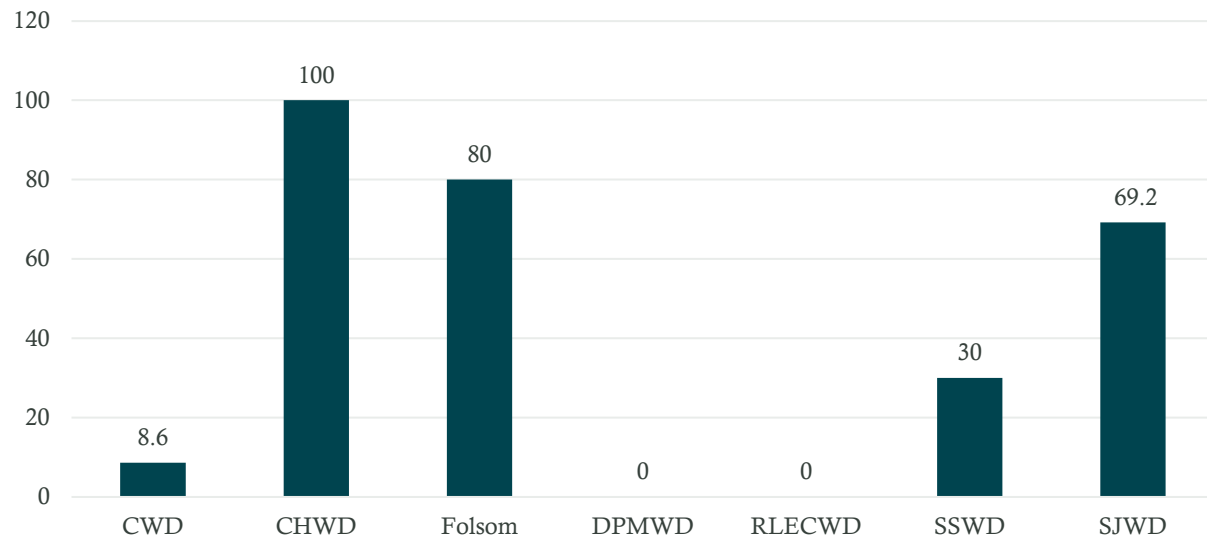
If scale capacities, contracting limitations, or desires to support local firms are not restrictive, cost savings could be obtained, particularly where larger minimum area or multiple year contract commitments are deemed acceptable. While paving requirements (thickness, material, etc.) may vary by participating agency, this would not be prohibitive to contractors since most roads share similar paving requirements. Some participants have cited the success of chemical consortia programs in achieving savings, despite varied requirements, as a template or reason for optimism in exploration of a successful paving collaboration.

Shown in Table 9 are the annual volumes of paving for each of the participating agencies. DPMWD primarily has pipes located in backyards, so they typically have little to no paving. When possible, both the number of paving work orders and the square feet of paved area were collected to gauge volume and size of projects. Figure 7 shows the number of annual paving work orders. The number of work orders do not always equate to a larger size of square feet paved, as can be seen comparing CHWD and SJWD reported annual square feet paved to the number of work orders. Note that Central Valley Engineering and Asphalt has the Folsom contract and bid on SSWD, suggesting that there are regional contractors with scale and appetite for broader coverage.

Table 9: Annual Paving Volume and Cost

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Number of paving work orders (annual)	8.6	100	80	0	N/A	30	69.2
Square feet paved (annual)	N/A	11,000	N/A	0	N/A	8,300	9,000
Contractor	Planet Paving and Grading	N/A	Central Valley Engineering and Asphalt	N/A	N/A	Flowline Contractors, GM Construction & Developer, and others	Sierra National Asphalt

Figure 7: Number of Annual Paving Work Orders



Joint Contract - External

While no contractor is currently contracting with multiple participating agencies for paving work, one firm, Central Valley Engineering & Asphalt¹⁴ is contracted with Folsom and bid on SSWD¹⁵ suggesting it may have the scale, capacity, and appetite required for a large amount of work. Despite the varying paving SOPs among the participating agencies, this should not necessarily be viewed as a barrier to a joint contract. The ability of a joint contract to meet the varying needs of multiple agencies is limited only by the capacity and responsiveness of the firm. It starts with a collaborative procurement that produces a well-crafted engagement agreement. Further, while some agencies have reflected that they prefer to work with smaller hyper-local firms, there may be opportunities for those seeking savings to achieve them through collaboration on a joint contract.

Outside Organization Support

SSWD noted that the Sacramento County Department of Transportation has supported them on paving efforts related to main replacement projects in the past and is believed to offer nominal cost savings vs. contractors. While these efforts generally took place on larger projects where more sizeable street work was done, perhaps the County might be interested in expanding their support to the kinds of paving efforts that the participating agencies contract out typically on a per square foot basis. This may present a new revenue opportunity for the County and savings for water agencies. Working with the County instead of a contractor can reduce inspection effort, ensure standards are met, and reduce administrative effort generally.

¹⁴ <https://cenvalley.com/>

¹⁵ SSWD is also contracted with Central Valley as part of our annual Water Services Agreement.

Program Costs

Figure 8 shows a comparison of paving costs per square foot. All the agencies with paving work are spending an average of \$13.65 per square foot paved. The annual cost of paving has been normalized per square foot of paved area to better compare the paving costs.

Figure 8: Cost per Square Foot Paved

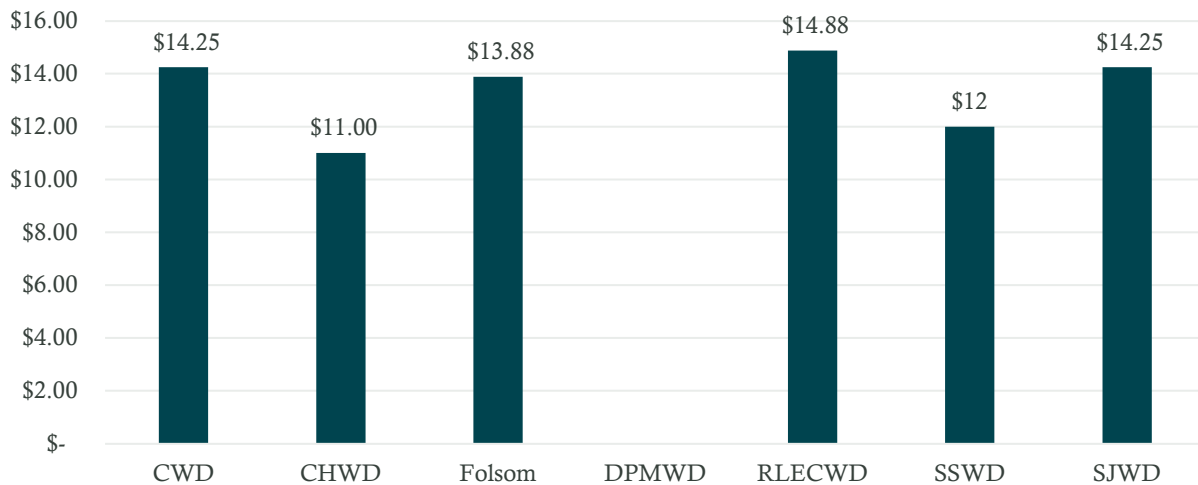


Table 10 suggests that the participating agencies might be able collectively save nearly \$110,000 or about 15% of costs if they jointly contracted at the best observed price based on submitted cost data.

Table 10: Paving Cost Analysis

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Total spend (annual)	\$172,747	\$109,000	\$90,161	\$0	\$25,000	\$183,188	\$128,250
Total paving cost at \$11 per sq ft	\$133,348	\$109,000	\$71,436	N/A	\$18,481	\$167,923	\$99,000
Difference in paving cost for best contract price per sq ft	\$(39,398)	\$-	\$(18,725)	N/A	\$(6,519)	\$(15,266)	\$(29,250)

Recommendations

A joint paving contract appears to be an opportunity for a quick win for interested study participants. While the dollars spent on this activity are not massive, and therefore the savings not all that substantial, this opportunity may be a good place to build momentum out of this Study. It will be

important to identify successful and achievable outcomes, such as this one, to ensure that over time more and more of the 80+ opportunities identified during the work bear fruit for the participating agencies. Still, the opportunity to achieve even deeper savings by working through Sacramento County on this effort should not be ignored. While collaboration with the County is less certain than contracting given that the County typically is involved only in larger projects rather than patch paving, it is worth asking them if they might be interested in smaller scale paving revenue opportunities before potentially pivoting to a joint contractor procurement.

Stand-by / Emergency Operations

Stand-by / emergency operations occur after normal business hours to address a concern or a system issue such as a leak or service failure. Discussions pertaining to the stand-by / emergency operations opportunities focused on after-hours on-call staffing costs and resource availability. Most participating agencies provide rotating staff with stipends or additional pay for weekly on-call duty with overtime pay for callouts. Other costs include dedicated vehicles, as well as answering service and other supporting technology costs (e.g. dedicated iPads, SCADA alarm systems).

Delivery Options

Participating agencies have four options to provide stand-by / emergency operations, as follows:

1. Status Quo
2. Joint Contract - External
3. Joint Contract – Internal
4. Consolidated Provision

These four options are described further in the sections that follow.

Status Quo

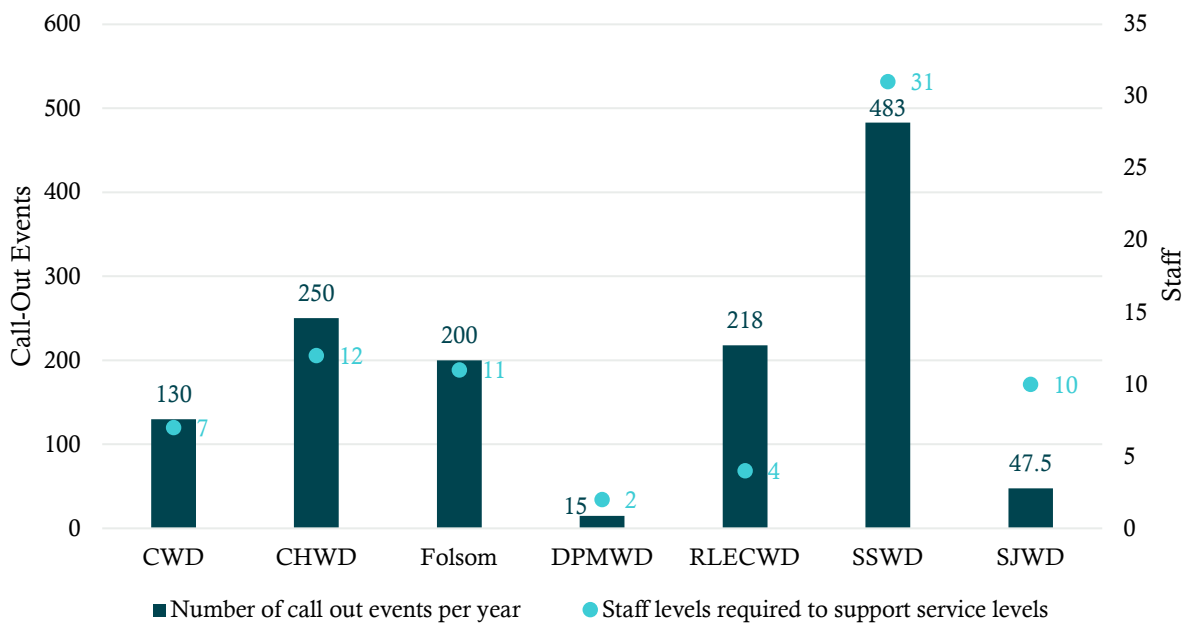
The number of emergency call-out events each agency responds to annually is shown in Table 11. The number of call out events refer to any instance where either the designated individual that is staffed on-call during after-hours times is dispatched with or without a support team. This table also shows the staff levels that are required to support the service levels currently provided. Staff levels reflect the number of people rotating through the on-call role, which typically rotates each week to provide equal opportunity for overtime pay and to divide workload equitably.

Table 11: Annual Call Out Events

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Number of call out events per year	130	250	200	15	218	483	47.5
Staff levels required to support service levels	7	12	11	2	4	31	10

Comparing the number of call out events per year across the agencies as well as the staff levels required, Table 11 shows that some agencies are staffed at a similar level to each other while the call out event volume is significantly different. In other cases, such as when comparing Folsom to RLECWD, the call out event volume is similar, but the staff level is quite different. Figure 9 presents the information from Table 11 in graphical form.

Figure 9: Call Out Events per Year and Staff Levels Required



Joint Contract - External

For joint contracts in this area the most likely opportunity is for a joint answering service to reduce cost redundancy in that area. The answering service could be an automated system that would route calls to each participating agency’s dispatcher on an only-as-needed basis for events that are appropriately handled by the utility staff during after-hours periods. It is possible that this service would help reduce the call volume required to be handled by overtime staff. Some have indicated that certain calls, such as wastewater related issues, need to be forwarded elsewhere. CWD spends nearly \$36,000 on answering services, while SSWD spends only \$6,100 per year, CHWD \$4,000 per year, and DPMWD just \$2,000¹⁶ per year. It may be worthwhile for the other agencies to get a better understanding of what each technology can offer to see how it might be deployed regionally at the lowest possible cost.

Joint Contract - Internal

Some agencies have expressed reservations about having staff from other departments handle stand-by or emergency after-hours staffing due to lack of system familiarity or other unknown concerns. However, for those that are interested, and particularly over time if SOPs, asset types, materials and

¹⁶ This was noted to be an estimate that includes the answering service as well as other technologies.

supplies, and emergency response protocols are aligned, it may be possible for the larger agencies to support the smaller agencies with stand-by emergency response. Some larger agencies in the region may have sufficiently infrequent rotation intervals that there is the possibility that staff would have an appetite for more overtime opportunities in support of smaller agencies where staff may be overburdened given the many hats they wear during normal operations and the additional burden of overtime needs. SSWD indicated such an arrangement may be possible. For some more routine after-hours calls the smaller agencies might not need to deploy any local staff in response, while local staff with key expertise could still be deployed as needed for more serious or unique circumstances. Other possible models might allow for more than just dispatcher support to avoid contractor costs during emergencies where some agencies don't have sufficient staff, equipment, or expertise to handle a given job alone.

Consolidated Provision

There are options for consolidated provision, but these are applicable down the road after demonstration of successful joint contracted approaches. Opportunities exist for a joint after-hours dispatch center, instead of a contract operated center. Depending on the training provided to the dispatch center workforce, there are opportunities for enhanced customer service with this approach. These include improved information and diagnostics for callers and limited account access services (bill information). A joint interactive voice response (IVR) system could complement these efforts or could be an alternative. There are also possibilities for a joint (pooled) after-hours workforce. Again, these should be considered after successful demonstration of joint contracted approaches and additional alignment of SOPs, policies, practices, etc.

Program Costs

The annual costs of labor and equipment for call out events have been normalized per call out event for comparison between agencies, as seen in Figure 10. These costs exclude answering service costs which are shown in Table 12. Note that SJWD spends far more than others on a per event basis as they reported by far the fewest events for a larger agency, while RLECWD spends far less than others per event as they had a relatively high number of events for the size of the district.

Figure 10: Labor and Equipment Costs Per Call Out Event

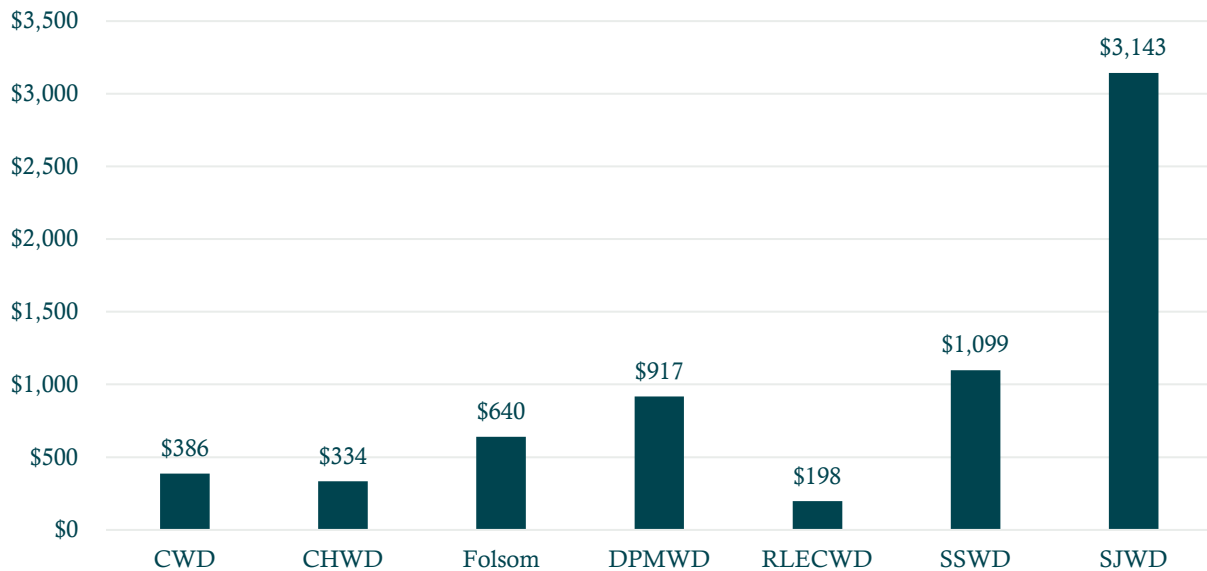


Figure 11 shows the number of weeks per year divided by the available staff for each agency and therefore gives an indication of the number of weeks of stand-by duty required of staff per year. Also shown is the number of weeks of stand-by duty required by staff if all participating agency staff were shared, therefore normalizing the weeks per year per agency, which would be about 4.7 weeks per year. Folsom, CHWD, and SJWD staff stand-by requirements are about average for the region, while CWD, RLECWD, and DPMWD are required to be on stand-by more often, and SSWD staff less often. To equalize the burden on staff at CWD, RLECWD and DPMWD, SSWD would need to provide service 36% of the time for CWD, 82% of the time for DPMWD, and 64% of the time for RLECWD.

Figure 11: Staff Stand-by Weeks Per Year

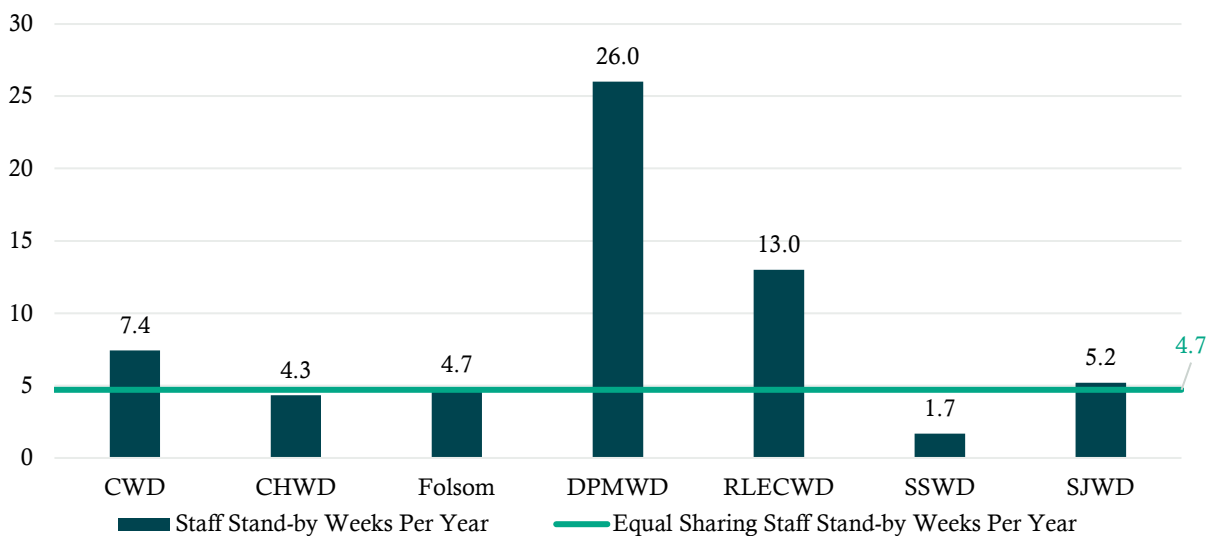


Table 12 breaks down costs for stand-by/emergency operations staffing and dispatch, excluding contracted support for emergencies requiring that a team be dispatched. The most likely participants in a shared service for staffing, dispatch duties, and callouts are SSWD and those smaller utilities that are near SSWD, namely CWD, DPMWD, and RLECWD. Costs for a scenario in which SSWD takes on stand-by duties for these agencies at the SSWD per call-out labor and equipment cost for a one FTE on-call level of service (which divides the SSWD rate by 3 as they staff 3 at a time) are reflected in Table 12. In this scenario SSWD service reduces the weeks of stand-by duty per staff per year to a smoothed regional level of about 4.7 weeks per year per staff for the agencies it supports, while also increasing the service levels to those agencies.

Also in Table 12 a shared answering service with additional capabilities to service the region has been estimated as the average of the costs provided by all participants less a 25% discount given technology efficiencies. The higher estimate of a 25% savings for the answering service (relative to the more conservative 10% assumption applied to several other collaborative contract opportunities detailed in this report) reflects the economic reality that technology investments scale more efficiently than other expenditures because common technologies spread over more users do not require incremental units of capital and labor all while technology development costs are spread over a larger user base. Still, where select study participants have zero or less advanced answering service capabilities, the increase in cost for some would need to be justified by the technologies ability to reduce after-hours call and dispatch requirements.

The most significant financial impacts of this scenario include an increased cost per year of about \$32,147 for RLECWD, and reduced cost for CWD of about \$28,099. This impact results from the relatively high call volumes at RLECWD with 64% of weeks now supported by SSWD at the SSWD rate, which is nearly 2X the reported RLECWD rate even when cut to one third for reduced after-hours staffing. Overall, the shared after hours service and enhanced answering service is estimated to cost the region just \$30,334 more than current spend levels in aggregate. In addition, resources that are constantly working after hours in smaller communities would be less stretched and idle resources at SSWD would have the opportunity for more overtime work.

Given that RLECWD's cost per event is significantly below all others, it may be worth revisiting the reported data to understand the differences. If costs to have SSWD support after hours requirements at a smoothed level are indeed cost prohibitive then this concept may not be attractive to RLECWD but perhaps a scaled down version might be attractive. The goal of this concept is to leverage the larger staff at SSWD to support burdened smaller staff at neighboring utilities by offsetting call outs in excess of regional average staff stand-by utilization of about 4.7 weeks per year per staff. The scenario would be executed using a schedule and service agreement. It is expected that this scenario could be complemented by reduced staffing needs through leveraging the best available answering service technologies under a joint contract. It is difficult to precisely estimate the reduction in staffed calls that the answering service could handle.

Table 12: Stand-By / Emergency Operations Cost Analysis

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD ¹⁷
Labor	\$45,700	\$83,565	\$127,990	\$12,758	\$43,184	\$373,282	\$160,772
Answering Service	\$35,990	\$4,000	\$0	\$1,000	\$0	\$6,100	\$0
Other - IT / Equipment / Vehicles	\$4,500	\$0	\$0	\$1,000	\$0	\$11,479	\$11,479
Total costs per year	\$86,190	\$87,565	\$127,990	\$14,758	\$43,184	\$536,881	\$149,293
Shared level of service labor and equipment costs (assumes SSWD per event costs for some calls for CWD, DPMWD, and RLECWD)	\$49,262	\$83,565	\$127,990	\$6,997	\$66,502	\$530,781	\$149,293
Shared answering service	\$8,829	\$8,829	\$8,829	\$8,829	\$8,829	\$8,829	\$8,829
Total cost with SSWD support for some and answering service for all	\$58,091	\$92,394	\$136,820	\$24,818	\$176,928	\$539,610	\$158,122
<i>Difference in cost</i>	(\$28,099)	\$4,829	\$8,829	\$1,068	\$32,147	\$2,729	\$8,829

Recommendations

A jointly contracted answering service or a joint IVR may be appealing. A well-designed service can reduce demands on staff time after hours. Coupled with afterhours support for smaller agencies by larger agencies, these collaborative changes could help to ensure that regional staffing is deployed after-hours more efficiently to respond to events. If some agencies are stretched thin and exhausted from after-hours duties and another would like more overtime opportunities for staff, then regional deployments during after-hours would appear to make sense for all. If the participating agencies do not wish to work towards collaboration on regular afterhours staffing, then support in lieu of contractors during select emergencies only may be another model for shared staffing. Next steps include:

¹⁷ While these costs may appear low for SJWD they are accurate based on the very few reported call-out events, which are the basis for the cost calculations.

1. A review of the coverage already offered by Mutual Aid Agreements for typical after-hours emergency support and any needed changes to accommodate more regional shared services after hours.
2. Confirmation of the availability of SSWD staff for after-hours support in neighboring communities that are stretched.
3. A review of the capabilities of the varying answering services used in the region and how the technologies differ.
4. A discussion with the answering service provider about the possibility of a regional system or deployment of IVR technologies.

Water Conservation Programs

Water conservation programs promote the efficient use of water resources by customers through education and awareness. The participating agencies operate in a Mediterranean, but drought susceptible climate in the northern half of California's Central Valley. They share limited and variable surface and groundwater supplies, which are coveted by other area users and those in the southern parts of the state. The water conservation program opportunity represents a chance to reduce water usage collectively and individually by encouraging efficient water use among customers. While reduced water usage can initially seem counter intuitive to a water utility because it presents the risk of revenue reductions (reduced volume consumed), well-designed practices can help to ensure water rates fully recover revenue requirements even on reduced consumption units. At the same time, regardless of the delivery option for messaging, programming, and incentives it can be difficult to directly measure the impacts of any one intervention or change in practice.

A component of a water conservation program is education detailing water usage trends and resulting impacts on rates. As such, and as reflected in the collective appetites for pursuing this opportunity, the participating agencies should consider enhanced water conservation through collaborative action to be both financially viable and practically important to pursue. Indeed, it is both the last drought, and the next, that should motivate such action.

The water conservation program opportunity was framed as an area where collaboration could occur to augment existing efforts by each participating agency to provide customer service programming and materials coordination. The goal is to foster joint efforts to enhance the communications channels that agencies utilize to increase awareness and participation in conservation activities.

As the participating agencies consider their relative spend overall and per capita relative to peers, as well as the programmatic detail in the Study's Activity 2 Report Appendix covering normal operations and drought only initiatives, each may find opportunities for enhancement through the various collaborative models to be explored in the following sections.

Delivery Options

Participating agencies have five options to provide water conservation programs, as follows:

1. Status Quo
2. Joint Contract - External

3. Joint Contract - Internal
4. Outside Organization Support
5. Consolidated Provision

These five options are described further in the sections that follow.

Status Quo

All the participating agencies except for DPMWD have dedicated water conservation programs in place. A table detailing the many varied channels, enforcement mechanisms, events, incentives, management tools, and other programming and messaging activities that each participating agency engages in is detailed in Appendix B of Activity 2. The participating agencies with water conservation programs use both internal staff resources as well as outside resources to provide the materials, incentives, and activities.

Water conservation programs may include the following:

- Educational materials and communication
- Outreach events and educational opportunities
- Incentivized or free water saving devices and equipment
- Water efficiency evaluations
- Water usage management tools
- Water conservation enforcement

Of the 71 unique water conservation initiatives identified by the participating agencies during Activity 2, SSWD is engaged in the most comprehensive program, covering 65 of those initiatives. Folsom has the second most comprehensive program with 43 initiatives, followed by CWD with 38, SJWD with 24, CHWD with 29, RLECWD with 7, and DPMWD with 0. Some of the smaller agencies reflected that community constituents might be opposed to water conservation initiatives because they feel that if water is not used, then it is at risk of being taken away by the State. This is highly speculative and may cause the utility to spend unnecessarily on pumping, treating, and distributing excess water. This does not benefit customers. Other participating agencies with relatively less extensive programs, may include stakeholders, whether on staff of the agency, on their Boards, or among customers, that feel water supplies are sufficient such that water conservation activities are a lower priority than other areas of focus. Further, some may fear that overly aggressive water conservation programming might threaten revenues. Despite these sentiments, there are current initiatives that many agencies feel they could save money on through collaboration and others where they would like to add or augment service levels through collaboration.

While the Status Quo approach maintains local control, it may not represent the approach offering the most value for customers of agencies seeking to find savings or enhance service levels. It also does not project a unified message about water conservation. A joint contract or other outside support, whether through an internal or external contract, or RWA, allows for specialization and the advantages of specialization as well as scale efficiency. If engaged for message and material development, for example, resources with expertise on content creation and knowledge of overlapping regional needs may be able to free up multi-tasking resources currently providing redundant services as each individual agency. Joint efforts might also reduce printing costs as scale increases. However,

the three modes of collaboration may diverge in their advantages, for example, an external contract frees up staff resources at all agencies, while an internal contract might benefit from lessons learned at agencies with already higher service levels, while finally, expanding the reach of existing RWA mechanisms might benefit from meetings, processes, and regional knowledge of needs that are largely already in play.

While the status quo only more narrowly achieves collaborative benefits in areas where it already occurs, such as joint coordinated communication efforts during droughts or through RWA, there are potential disadvantages to more collaborative models that must be considered as well. Fundamentally any new joint initiative, whether internal, external, or through RWA will require some administrative effort to setup and manage. Further, joint efforts may raise concerns about equity and value that must be addressed in program design to ensure participants get their fair share of benefits. The procurement process itself is a disadvantage of the external contractor approach due to the administrative effort and time it demands. Outside organizations may only be able to service isolated elements of areas of water conservation program collaboration interest. Finally, internal contracting may heighten equitability concerns if resources from one agency are deployed to perform the service or if larger entities are perceived to have excess influence on resource deployment.

Joint Contract - External

The participating agencies have varied goals and services levels, and associated relative expenditures, relating to contractors/consultants providing water conservation services, water efficiency supplies or incentives, and outreach materials. Potential areas for joint external contracting may be identified from existing contracts for material development and printing, and there may be other new opportunities for agencies to explore as well to augment service levels as desired in a cost-effective manner. In the realm of opportunities that are new interests for some but existing contracts for others, RLECWD indicated that they are looking at a pilot opportunity for customer portal software that allows users to track usage and potentially modify behavior to reduce bills accordingly. Two participating agencies have similar technology, suggesting a joint contract in this area could benefit the region where standards align.

SJWD has a consultant to design information material for the water conservation program. Other participating agencies may wish to have information materials designed by a consultant as well. This could lead to a joint contract to design shared educational materials. SSWD has an annual contract for public relations services, which includes the water conservation program as well as other public relations needs of the agency. A joint external contract for public relations services relating to water conservation may allow agencies with multi-tasking staff, such as in CWD, CHWD, and RLECWD, to free staff time up to spend on other function needs. Other options include coordinating joint newspaper print ads to reduce individual ad expenditures and increase ad reach and bulk purchasing of water efficiency materials at reduced pricing.

Joint Contract - Internal

Sharing services and collaborating with internal resources has the potential to provide high levels of service with somewhat lower total expenditures. These shared services could include running joint outreach campaigns and joint rebate programs that are managed by the participating agencies, contracting with an agency with more staff resources to develop the materials. Other options may include outreach campaigns like the ones the agencies currently partner on, such as the student art contest. Schools are presented a different water awareness theme each year and students create drawings based on the theme. This is a great example of a shared resource that will have a lower expenditure if more agencies are involved. During droughts, all agencies noted that water conservation activities are increased and, in some cases, additional staff and resources are allocated. An internal contract that is used to provide additional support during a drought, such as staff time or joint mailers, would allow the participating agencies to ramp up communications to customers during these periods of need.

Other identified options include joint workshops or collaborative landscape irrigation reviews. SJWD holds six on-site workshops each year that are focused on water conservation conservation-related topics. Typically, these include landscape design, irrigation management, tree pruning/tree care, right plant/right place, irrigation system repair/maintenance, smart controllers, and native planting to attract wildlife. CHWD conducts multiple in-person WaterSmart classes which cover topics such as reducing landscape water usage and lowering costs. These classes were offered online this year by CHWD. The participating agencies could develop a joint internal contract to share educational materials and partner on workshops. Perhaps the agencies could provide joint workshops/classes for the region and even increase the number of offerings. SJWD staff provide landscape irrigation reviews by appointment. These reviews help identify potential water leaks, misguided sprinklers, and excessive irrigation run times. Providing this service through an internal contract with the participating agencies would be another way to leverage the enhanced programs of some agencies.

Outside Organization Support

The Regional Water Authority (RWA) offers programming to support regional collaborative success. The participating agencies identified an appetite for more regional collaboration offerings during the opportunity prioritization process. This suggests that RWA and other activities could be expanded.

RWA's Regional Water Efficiency Program (RWEF) provides a regional toolbox for water conservation education. In 2019, RWEF partnered with five of the program participants, including SSWD and Folsom, to promote water conservation activities and RWA covered costs for graphic design and half of the direct costs for advertising for running co-branded ads.¹⁸ SJWD hosted RWEF's Mulch Mayhem event which provides free mulch to customers; mulch preserves the water in the soil and prevents weed growth. The participating agencies could expand their participation with RWEF and explore opportunities, such as joint advertising, educational webinars for customers, and joint Water-Wise House Calls contract to reduce expenditures while increasing services. Further, RWA's Check and Save campaign messaging and outreach tools can be used by all members. Some

¹⁸ Regional Water Authority, The Regional Water Efficiency Program 2019 Year in Review, https://rwah2o.org/wp-content/uploads/2020/06/RWEF_2019AnnualRecap_5.pdf

communities do not participate in RWA, or even if members may not fully utilize what is provided by the RWA program; however, it is also possible that the regional toolbox could deliver even more.

Another element within this area of opportunity is a concept of involving Non-Government Organizations (NGOs) such as community non-profit groups to provide installation or cost assistance to low-income households to improve their indoor or outdoor water efficiency.

Consolidated Provision

If initial collaborative efforts on water conservation programs take root, then additional unification of programs is a possibility. This would allow the region to set more uniform conservation goals and offer coordinated programs. This would prevent a person in one neighborhood from receiving different messaging than a person in another neighborhood, simply because they have different utility providers. Even though each of the participating agencies have unique water rights, they all operate under the same general hydrologic conditions. This means that their conservation programs should have a high level of alignment.

In the future, a consolidated water conservation program model is possible. This is an evolution of the joint contracting and Outside Organization Support options.

Program Costs

The water conservation program costs are related to the specific employees dedicated to water conservation and the additional external costs, such as consultants developing outreach materials, printing outreach materials, fees towards RWA's efficiency program, and water efficiency evaluations costs. Figure 12 shows the annual costs of water conservation programs at each participating agency. The three largest agencies (Folsom, SSWD, and SJWD) have the highest total costs. However, as shown in Figure 13, CWD, and Folsom have higher spending in terms of conservation program spending per capita.

Figure 12: Costs of Water Conservation Programs

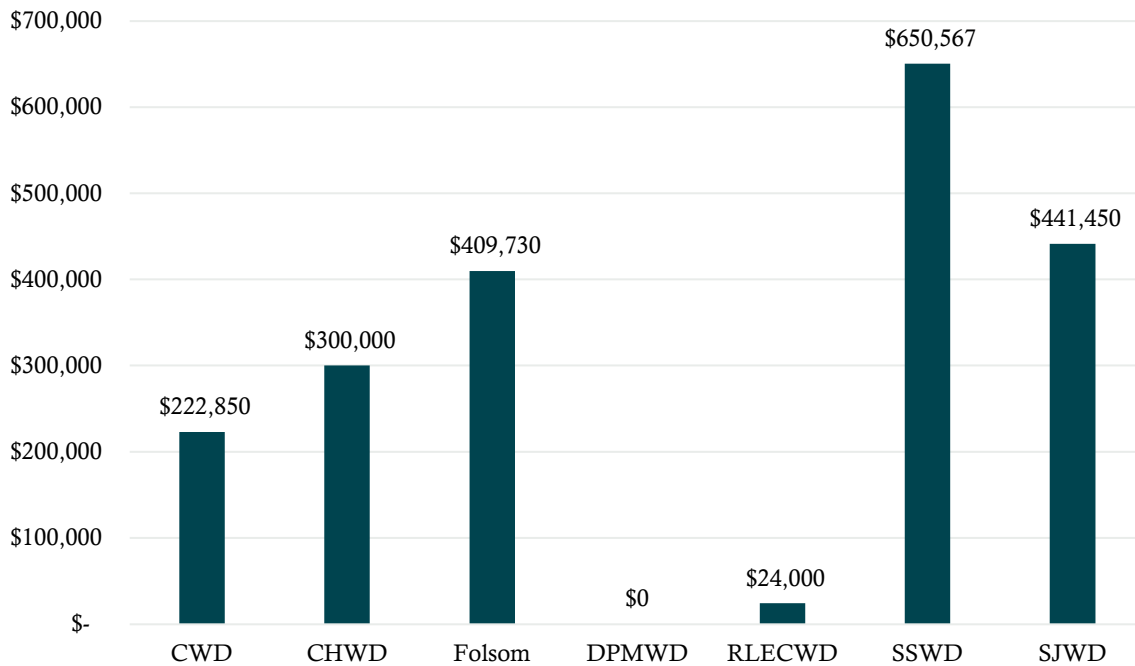
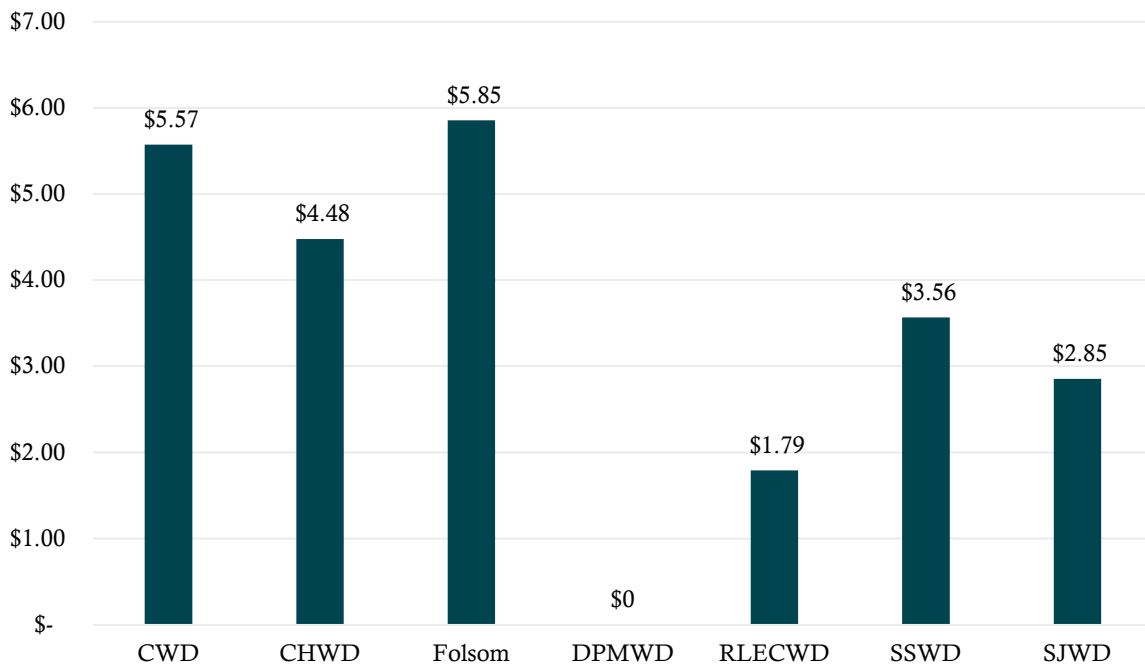


Figure 13: Costs of Water Conservation Programming Per Capita



The water conservation programs of each agency provide varying levels of service (see Appendix B for programmatic detail). Comparing the potential costs relating to the options to develop a joint external contract or joint internal contract, and further leverage other organization support really depends on the extent to which these options are employed. Consider that Folsom currently has the

highest water conservation program cost at \$5.85 per capita. If all the other agencies spend at an equivalent level, the cost of the program and the difference in cost is shown in Table 13.

Table 13: Water Conservation Program Cost - Status Quo

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Status Quo – total programming cost	\$222,850	\$300,000	\$409,730	\$0	\$24,000	\$650,567	\$441,450
High level of service - Total programming cost at \$5.85 per capita (Folsom level)	\$234,131	\$392,170	\$409,730	\$29,073	\$78,434	\$1,068,225	\$905,977
Difference in programming cost (line 2 minus line 1)	\$11,281	\$92,170	\$0	\$29,073	\$54,434	\$417,658	\$464,527

While the comparison in Table 13 provides a general idea of the cost difference in ramping up levels of service across the different agencies, the cost of the options presented in this report is more complex and how they are implemented will impact spending at each agency. Costs provided by the participating agencies were sometimes specific enough to allow for assumptions about costs relating to the options to develop a joint external contract, joint internal contract, and expand other organization support. Table 14 highlights the specific areas in which the costs may be impacted: the water conservation program staff costs, the print media consultant costs, and the RWA Regional Water Efficiency Program related costs. Table 14 also provides some cost information about water efficiency supplies or incentives, but the information was not provided separately by all agencies.

Table 14: Current Water Conservation Program Costs - Detailed

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Dedicated Water Conservation FTE	1.83	1.5	3	0	0.33	2	3
Total FTE Costs	\$198,050	\$89,440	\$400,730	\$0	\$24,000	329,373	\$441,450
Consultant, Print Media, & Miscellaneous Costs	\$1,500	\$47,000	\$9,000	\$0	\$0	\$225,824	\$98,080
Water efficiency supplies/incentives (if broken out of cost)	\$8,000	\$9,275				\$56,000	
RWA Regional Water Efficiency Program related costs	\$15,300					\$39,370	

For the joint contract - external option, the potential to share consultant costs to design information material was considered. SJWD currently has an annual contract with a consultant to design information material totaling \$98,080 across both retail and wholesale customers. For this calculation, the contract is assumed to include printing costs as well. This breaks down to \$0.63 per capita. If a joint contract is assumed to result in a 10% discount, the per capita cost would be \$0.57. The cost for each agency to pay for the consultant based on the population they serve is shown in Table 15. The total related programming cost as well as the difference from the total programming cost at status quo is also shown. Aggregate 10-year savings of \$776,335 are estimated via this approach (this is the sum of the last line of Table 15 multiplied by 10 years). This joint contract option may also likely reduce employee time spent on certain related tasks, which could free up multi-tasking staff for other functional needs, potentially reducing contractor support needs in other areas or enhancing service levels.

Table 15: Water Conservation Program Cost Estimate - Joint Contract - External

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Joint Contract - External – Consultant Cost Based on \$0.57 per capita (SJWD contract costs with 10% savings)	\$22,812	\$38,210	\$39,921	\$2,833	\$7,642	\$104,080	\$88,272
Joint Contract - External – Total Programming Cost replacing current contract costs with line above	\$244,162	\$291,210	\$440,651	\$2,833	\$31,642	\$528,823	\$431,642
<i>Difference between Status Quo and Joint Contract – External Total</i>	\$21,312	(\$8,790)	\$30,921	\$2,833	\$7,642	(\$121,744)	(\$9,808)

A joint internal contract would likely consider the areas of program administration and outreach and education that could be shared across agencies. The cost sharing here would be very specific to the agencies that are sharing services and the amount of time agreed upon. For example, CHWD has the lowest water conservation FTE costs at \$59,627 per staff, while DPMWD and RLECWD have the fewest water conservation resources at just 0 and 0.33 FTE respectively. If these three agencies developed a joint contract for CHWD to provide 0.5 of their current FTE total as support for the two other agencies (DPMWD and RLECWD would each pay for 0.25 FTE), CHWD could recover additional revenue should their staff have capacity to provide this support. In this scenario, DPMWD could increase service levels for the lowest possible cost, and RLECWD could expand service levels at a savings as compared with their own per FTE costs. This example is detailed in Table 16.

Table 16: Water Conservation Program Cost Example - Joint Contract - Internal

	CHWD	DPMWD	RLECWD
Cost per Water Conservation FTE	\$59,627	N/A	\$72,727
Current Total Water Conservation Costs (Status Quo)	\$300,000	\$0	\$24,000
Joint Contract – Internal – Total Programming Cost CHWD assists DPMWD and RLECWD	\$270,187	\$14,907	\$38,907
<i>Difference between Status Quo and Joint Contract – Internal Total</i>	<i>(\$29,813)</i>	<i>\$14,907</i>	<i>\$14,907</i>

CWD and SSWD currently budget \$15,000 and \$39,370 annually for costs related to the RWA Regional Water Efficiency Program respectively. CWD notes this is related to regional outreach and communication materials whereas SSWD notes this is budgeted for Water-Wise house calls from the program. The other participating agencies did not provide specific budgets relating to RWA.

It appears that the RWA Regional Water Efficiency Program provides an existing toolbox for regional outreach and communication, which can be potentially enhanced. Because the capabilities of RWA are shared across agencies beyond the Study participants it would be hard to estimate cost impacts of greater levels of service from RWA – even if 1 FTE were added; however, the cost impacts to each participant would likely not be substantial other than for those that are not currently RWA members should they decide to join.

Recommendations

Using water resources wisely should be the goal of all the participating agencies. An effective conservation program is necessary to meet this goal. Even agencies with seemingly adequate water resources and more pressing needs for funding will realize benefits from using water resources wisely, among them are lower capital and operations costs associated with pumping and distributing less water per capita. While there may be some short-term challenges associated with rate design and funding conservation programs, the value should more than offset any drawbacks.

The core utility messaging to consumers about water conservation should be very similar across organizations to eliminate stakeholder confusion. By leveraging the similarities, the participating agencies can use common communications tools and leverage many similar program elements. This provides opportunities to achieve efficiencies. This means that the participating agencies and their customers benefit by taking a more regional approach to water conservation. This doesn't mean that all the participating agencies need to invest the same amount in conservation programs, nor do they even need to offer the exact same programs. They simply need to collaborate on the universal elements to achieve benefits.

The analysis performed highlights advantages of Joint Contracting, both internal and external, while taking advantage of Outside Organization Support largely coming from organizations like RWA. It shows that there is potential for cost savings through agencies working together, given similar program elements. Quantification of the exact savings levels expected is difficult to determine since each agency currently provides a different level of service to customers.

Water Supply

The Sacramento Region's water suppliers have opportunities to preserve and leverage their water assets through collaboration. Table 17 shows the participating agencies' water supplies and water demands. Availability of dry-year supplies depends on regulatory conditions and past water use. This section provides the rationale for engaging in collaborative water supply management, assesses collaboration opportunities, and identifies opportunities where collaboration can provide short-term and long-term benefits. The section also describes mechanisms to engage the identified collaboration opportunities.

Table 17: Participating Agencies Water Demands and Supplies (AFY)

	1	2	3	4	5	6
Agency*	Current Demand (Annual)	Future Demand	Own Surface Supply	Contract Surface Supply	Own Reasonable GW Capacity**	Future Surplus / Deficit w/ GW = (3+4+5)-2
SJWD	12,000	13,000			0	
CHWD	12,400	13,100			5,000	
FOWD	8,800	9,600	33,000	49,200	8,343	55,343
OVC	3,500	3,900			500	
Ashland	1,100	1,100			0	
San Juan Family Totals	37,800	40,700	33,000	49,200	13,843	55,343
DPMWD	1,700	1,700	0	0	2,460	760
CWD	10,000	10,000	32,627	0	2,200	24,827
SSWD	29,000	39,567	0	55,064	135,493	150,990
Folsom	19,000	28,200	34,000	0	0	5,800
RLECWD***	2,500	17,000	0	0	15,767	-1,233
Other Agency Totals	62,200	96,467	66,627	55,064	155,920	181,144
All Agency Totals	100,000	137,167	99,627	104,264	169,763	236,487

*Agencies include portions of service areas and retail entities

**Capacity determined from recent published planning documents

***Future contract supplies that have not been secured, such as those noted in other reporting in support of the RLECWD future demand in excess of current supplies, are not included in the table

Rationale for Water Supply Collaboration

The participating agencies may have numerous reasons to engage in water supply collaboration activities. Regional water supply collaboration can: a) help improve water supply reliability, b) help preserve each entity's water assets, and c) potentially create revenue streams. The intersection of all three items should be considered in the context of developing regional collaborative water asset management opportunities.

Preservation of water assets should be a primary driver for the participating agencies. Regulatory and climatological factors continue to lessen the availability of water supplies that were once considered firm. For example, the State Water Resources Control Board (SWRCB) curtailed all of CWD's surface water supplies in 2015, including its 1915 License and other pre-1914 appropriative water rights on

the Sacramento and San Joaquin River systems with priority dates as old as 1903.¹⁹ The frequency of curtailments, like this one, may become more common in the future as the regulatory conditions tighten and climatological conditions change. The Bay-Delta Water Quality Control Plan (BDCP) may permanently change water rights in the Sacramento River watershed. In 2018, SWRCB adopted BDCP amendments on the San Joaquin River system that require increased “unimpaired flows” in the tributaries of the San Joaquin River.²⁰ Implementation of the new San Joaquin River standards will occur through “water right actions or water quality actions.”²¹ The American River watershed purveyors will likely experience a similar future and have already taken some actions to counter the potential water rights changes.²² In addition, California’s climate change predictions indicate reduced snowpack (reduced water storage) and climatological extremes that may impact long-term water supply availability trends.²³ Given the past actions and possible future developments, regional purveyors are wise to protect their water assets to maintain reliable water supply deliveries to their customers.

Preservation of water assets has a financial component. Water assets have a monetary value that will likely increase over time as water scarcity, specifically surface water scarcity, becomes more acute. As noted in the Activity 2 report, the current water asset value of *surplus water* in the region approximates \$250 million (see Activity 2 Report) and the future value will likely be much higher. Accordingly, the actual value of the regional water supplies necessitates collaborative actions to preserve purveyors’ primary capital asset – water.

The participating agencies and their ratepayers should protect water assets that they have expended time and money to develop. As noted elsewhere in this report, the regional purveyors have significantly invested in water conservation messaging, irrigation efficiency programs, and regionally sponsored lawn replacement and water-fixture replacement programs. In addition, the participating agencies’ ratepayers have spent money to replace aging water fixtures, improve landscape water efficiency, and improve conservation *at the personal level* – completely outside of any regionally-sponsored programs. These financial investments have created real water conservation savings that should be protected and preserved under applicable laws. Others may seek to reap the benefits of the region’s expenditures to conserve and more efficiently use water.²⁴ All of the other collaborating

¹⁹ https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/pre14curtailmentjun2015.pdf

²⁰

https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2018_sed/docs/appx_k_revised_w_adopted_changes.pdf

²¹ *Id.*

²² Regional purveyors engaged in extensive negotiations with regulatory agencies on Flow Standard settlement options but, to date, have not successfully concluded those negotiations.

²³ <https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Climate-Change-and-Water>

²⁴ Water Code section 1011(a) states in relevant part: “When any person entitled to the use of water under an appropriative right fails to use all or any part of the water because of water conservation efforts, any cessation or reduction in the use of the appropriated water shall be deemed equivalent to a reasonable beneficial use of water to the extent of the cessation or reduction in use.”

agencies have conserved assets with quantifiable values. In short, collaboration can help protect the participating agencies and their ratepayers' water conservation investments.

Collaboration can result in improved regional dry-year reliability. There are differing rules and policies that relate to the availability and management of each regional water asset. Closely examining these rules and policies – and even challenging or changing them where necessary – may enhance the regional dry-year water supply reliability. For example, a Central Valley Project (CVP) contract water entitlement must be used in a 100% CVP allocation year for any amount of that entitlement to be available for use in dry years. The Central Valley Project Municipal and Industrial Shortage Policy (M&I Shortage Policy)²⁵ adjusts water allocations in dry conditions based upon historical use derived from 100% allocation conditions. Thus, from a fundamental perspective, using CVP supplies in 100% allocation years – generally the years when those supplies are least needed – makes CVP supplies available in dry years. In addition, provisions within the M&I Shortage Policy may allow accounting for use of other, non-CVP water supplies, to determine availability of CVP water supplies in shortage conditions.²⁶ Expanding opportunities to use CVP Project Supply in dry years improves the regional reliability for entities that may not have access to that specific water source. Furthermore, there may be opportunities where reorganization improves supply reliability by expanding opportunities to use of one or more water assets beyond the assets' existing places of use. Collaboratively managing water assets while addressing regulatory and policy issues, like the M&I Shortage Policy, would likely provide lasting benefits for future regional water supply reliability.

Collaboration can result in monetizing surplus water assets. Since 2009, several regional water purveyors have generated revenue through groundwater substitution transfers. In 2020, the regional purveyors netted approximately \$4.33 million through a regional collaboration that leveraged surface water and groundwater assets.²⁷ These *ad hoc* short-term annual transfers could be deliberately organized through pre-determined planned activities that maximize transferable assets and better protect regional supplies. For example, the planned activities could include deliberate use of water assets in a prescribed manner to improve opportunities for groundwater substitution that maximize transferable water assets. Revenues generated from these actions may be specifically earmarked for identified collaborative actions – like infrastructure improvements, investments in water conservation and efficiency, enhanced supply management activities, and customer rebates.²⁸ In addition, future collaborative actions related to groundwater banking and re-timing surface water supply deliveries may provide additional opportunities to monetize water assets. All of these activities should be further explored in order to leverage the financial benefits of short-term and long-term transfer opportunities.

Water Supply Collaboration Opportunities

The regional water purveyors have numerous opportunities to collaborate on water supply management activities to preserve water assets, improve water supply reliability, and generate revenue. The regional purveyors have engaged in numerous planning activities that identify general

²⁵ <https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf>

²⁶ Id.

²⁷ “Purchase Agreement For Water Transfer Between Sellers And Buyers” June 24, 2020.

²⁸ One regional entity plans to use its 2020 groundwater substitution revenues for direct customer rebates.

collaboration actions. For instance, the 2019 Regional Water Reliability Plan provided recommendations for actions to support the proposed regional water bank. “Recommendation 2.1” was titled “Take early actions to expand conjunctive use operations and prove concepts of storage (bank deposits) and recovery (bank withdrawals)” and then discussed the 2018 regional groundwater substitution transfer as “types of pilot actions... to further increase operational intelligence.”²⁹ The collaboration opportunities described in this section are actions, like the 2018 and 2020 groundwater substitution transfers and the recent water conservation transfer, that support regional water supply objectives. Table 18 at the end of this section summarizes the collaboration opportunities, potential benefits, and collaboration methodologies.

Water Code Section 1011 Water Conservation

The paramount opportunity to preserve regional water assets is to collaborate on quantifying conserved water. Water Code section 1011 states in relevant part: “When any person entitled to the use of water under an appropriative right fails to use all or any part of the water because of water conservation efforts, any cessation or reduction in the use of the appropriated water shall be deemed equivalent to a reasonable beneficial use of water to the extent of the cessation or reduction in use.” Thus, this section equates the quantified conservation savings to “beneficial use” so as to preserve the water asset under California’s general “use it or lose it” appropriative water right principle.³⁰

Appropriately protecting conserved water supplies requires a coordinated approach to assessing the quantification methodology and conservation reporting for the water assets. Specifically, appropriate baselines and savings calculation methodologies for indoor, outdoor, and system loss quantification must be appropriately coordinated for both the legal interpretations, needed to ground identified conservation savings, and the calculation methodologies used to support the legal interpretations. Accurately calculating and quantifying conserved water assets among the participating agencies is the first step in securing those water assets for current and future water uses. Importantly, this calculation methodology may be distinct from the methodology used to calculate conserved water that is available for transfer. In addition, consistently reporting the conservation savings in Statements of Diversion and Use, Reports of Licensee, Permit Progress Reports, Annual Reclamation Reports, and other broader reporting documents – like Urban Water Management Plans and Water Master Plans – will be important for preserving water assets.³¹

Water Code Section 1011.5 Groundwater Use

Another important action to preserve regional water assets is to quantify surface water assets that could have been used in lieu of groundwater supplies in consideration of conjunctive use opportunities. Water Code section 1011.5(b) states in relevant part: “When any holder of an appropriative right fails to use all or any part of the water as a result of conjunctive use of surface water and groundwater involving the substitution of an alternate supply for the unused portion of the surface

²⁹ Regional Water Reliability Plan, Stantec, May 2019 at 4-3 (developed for RWA).

³⁰ All water assets, surface and groundwater, used by the collaborating agencies are derived from appropriative water rights that apply the “beneficial use” principle derived from Article X, Section 2 of the California Constitution.

³¹ The 2021 water reporting documents have new reporting requirements related to conserved water and other water management items.

water, any cessation of, or reduction in, the use of the appropriated water shall be deemed equivalent to a reasonable and beneficial use of water to the extent of the cessation of, or reduction in, use, and to the same extent as the appropriated water was put to reasonable and beneficial use by that person.” Thus, quantifying water assets preserved under this portion of California law will require assessing the opportunities among the collaborating agencies where groundwater was used in lieu of available surface water supplies. Some of these opportunities may be less obvious such as FOWD’s use of SJWD’s surface water assets in FOWD’s service area.

The regional purveyors should collaborate – especially among wholesale and retail agencies – to fully assess the opportunities where surface water and groundwater were conjunctively used to identify and preserve the surface water supplies for current and future uses under Water Code section 1011.5. This investigation requires data sharing among the participating agencies and other potential regional collaborators with thoughtful dialogue about conjunctive use opportunities. Moreover, this collaboration must align data gathering and sorting efforts as well as numerical representations in the numerous reporting documents like Supplemental Statements of Diversion and Use, License and Permit reports, and Reclamation reporting documents. Importantly, this collaborative conjunctive use quantification effort will further support related water management activities that are described elsewhere in this section – like short-term and long-term water transfers, Reclamation’s M&I Shortage Policy implementation, and legislative and regulatory advocacy.

Water Code Section 1010 Polluted Water Use

Like section 1011 and 1011.5 above, another opportunity to preserve water assets is tied to Water Code section 1010(a)(1) where substituted use of polluted water in lieu of potable water counts toward potable water beneficial use. The code states: “The cessation of, or reduction in, the use of water under any existing right regardless of the basis of right, as the result of the use of recycled water, desalinated water, or water polluted by waste to a degree which unreasonably affects the water for other beneficial uses, is deemed equivalent to, and for purposes of maintaining any right shall be construed to constitute a reasonable beneficial use of water to the extent and in the amount that the recycled, desalinated, or polluted water is being used not exceeding, however, the amount of such reduction.” Thus, where collaborating agencies use polluted supplies in lieu of other supplies, the agencies may apply the non-potable use to their other water supplies. CWD has used Aerojet Groundwater Extraction and Treatment (GET) supplies for its supply during curtailment and to irrigate a golf course, Golden State Water Company (GSWC) and Sacramento County Water Agency (SCWA), use GET water in lieu of surface and groundwater, and other opportunities where GET water could be used should be explored. Collaboratively organizing characterization, use, and reporting of non-potable supplies would support long-term water supply preservation objectives.

Engage in Water Supply Deliveries Permitted Under Rights and Contracts (not transfers)

The participating agencies have opportunities to better use regional water assets to preserve those assets for current and future uses as well as develop more robust opportunities for asset monetization. Specifically, the rationale for delivering water assets to alternative users will allow more water to be claimed “as beneficially used” and improve opportunities to increase the volumes of supply available in dry years. Importantly, flexibly managing water asset portfolios does not jeopardize the availability

of unused assets nor jeopardize the water rights themselves.³² Thus, finding ways to beneficially use water assets more effectively among the regional agencies improves the long-term viability of the entire region's water asset portfolio.

The water asset inventory conducted in Activities 1 and 2 and shown in its final form in Table 17 show opportunities for additional delivery actions that would help demonstrate beneficial use and support water asset preservation objectives. The following provides a listing of the most prominent examples:

- SJWD deliver pre-1914 water to CWD and use CVP Project Supply³³ in normal years to support water supply reliability. CWD is in the place of use of SJWD's pre-1914 water supply and has historically used SJWD's supply in CWD's service area.³⁴
- SJWD uses PCWA surface supply contract and delivers pre-1914 supplies to other collaborating agencies. The substitute supply would support deliveries and transfers.
- CWD uses City of Sacramento water supplies contracted and wheeled through SSWD's water system in the portion of CWD's service area contained in "Area D."³⁵ SSWD uses either groundwater or PCWA surface supply contract.
- City of Folsom delivers pre-1914 water to Golden State Water Company and uses CVP Project Supplies in normal years to improve water supply reliability in dry years.³⁶
- SJWD uses PCWA surface supply contract and delivers pre-1914 supplies to other collaborating agencies. The substitute supply would support deliveries and transfers.
- CHWD, FOWD, RLEWCD, SSWD, and CWD deliver groundwater supplies – either banked supplies or pumped supplies – to a neighboring water agency (SSWD and FOWD have delivered groundwater assets to neighboring agencies in the past) to demonstrate possession and collaborative flexible management of the groundwater supplies.

There are additional water supply and delivery actions that could be examined as part of a regional collaboration. For example, there are unused Aerojet Groundwater Extraction and Treatment (GET) water supplies that are pumped and discharged into the American River that could be captured and used by participating agencies. CWD has captured and used these supplies in the past.³⁷ The available GET supplies exceed the supplies delivered under contracts to Golden State Water Company and

³² This important concept is beyond the scope of this report but the rules of abandonment or forfeiture would not impact these management actions.

³³ There are additional opportunities for managing SJWD's CVP Project Supply under its WIIN Act Contract related to "carryover" and "preuse" of CVP Project Supply but those concepts require further investigation.

³⁴ CWD conducted an historical assessment related to the use of SJWD's water assets demonstrating an expanded place of use that includes some of CWD's service area.

³⁵ Area D refers to the place of use of the City of Sacramento's water rights and contracts that are beyond the City's boundaries. SSWD has a contract to use and deliver City of Sacramento water assets to Area D. Concurrence by the City may be required.

³⁶ Folsom and GSWC hold "joint tenancy" to the pre-1914 appropriative water right from the American River derived from Natoma Water Company.

³⁷ CWD entered contracts to divert and use surplus GET water in 2014 and 2015 as part of its drought mitigation strategy.

Sacramento County Water Agency.³⁸ In addition, under surplus American River flow conditions, the SWRCB has issued accelerated permitting processes for agencies to capture those supplies for use. SSWD has initiated investigations into these accelerated permit supplies to expand conjunctive use options.³⁹ These additional water asset opportunities should be coordinated and pursued among the collaborating agencies to improve and enhance regional water supply preservation and reliability.

Water Transfers for Water Supply Reliability and Water Asset Monetization

Water transfers provide an important mechanism to improve regional water supply reliability as well as preserve water assets for current and future uses. As a starting point, Water Code section 1745.07 states in relevant part: “A transfer that is approved pursuant to this article or any other provision of law is deemed to be a beneficial use by the transferor under this code.” Accordingly, transferring water – whether for local purposes or export purposes – is a beneficial use of water that helps preserve the water asset for the transferor’s current and future uses.

Water transfers could be used to better support regional water supply reliability. Specifically, water transfers allow purveyors with underutilized water supplies to deliver those supplies to neighboring agencies in times of water shortage. There are three important regional transfer opportunities available to the participating agencies: (1) water conservation transfers, (2) groundwater substitution transfers, and (3) multi-party water exchanges.⁴⁰ In other words, water transfers can occur through direct delivery of surplus supplies, through conjunctive use actions, or in a coordinated exchange where alternative water supplies replace supplies that “would have otherwise been used” by the transferring agency. These types of actions require well-planned and coordinated thought before the water need arises. As noted in the previous section, successful water transfers that improve regional water supply reliability may *require* use of certain water supplies in years where those supplies may not otherwise be needed. Furthermore, all water transfers can be structured as short-term transfers or long-term transfers – each type with a different set of rules that impact transfer viability while preserving the reliability of the transferred water. The following examples of actionable collaborative water transfers would provide additional regional supply reliability:

- SJWD delivers conserved surface water supplies to SSWD (SJWD and SSWD executed this conserved water transfer in 2020).
- CWD delivers conserved surface water supplies to SSWD. CWD would prepare a SWRCB temporary change petition to execute this transfer.
- SSWD delivers City of Sacramento contract water supplies to CWD and uses groundwater or SSWD contract in lieu of the City of Sacramento supply. A portion of CWD lies within Area D.

³⁸ Aerojet GET discharged supplies are derived from continuous pumping at GET facilities.

³⁹ SSWD explored the options to divert and deliver surplus American River water under Governor Brown’s 2019 Executive Order

⁴⁰ The regional agencies could also engage in reservoir re-operation transfers with regional agencies that are not participating in this project (PCWA, the City of Roseville, and El Dorado Irrigation District).

- SJWD and Folsom maximize CVP Project Supply use in normal years to preserve CVP Project Supply for their use in critically dry years and/or their ability to deliver pre-1914 water rights water to other collaborating agencies (an exchange).
- CHWD and FOWD use groundwater supplies in lieu of surface water deliveries from SJWD to free SJWD pre-1914 water rights water for delivery to other agencies.
- SJWD uses PCWA surface water supply contract water in dry years to deliver SJWD pre-1914 surface supplies to other agencies in dry years – like CWD. The transferee would pay the difference in water supply delivery costs to SJWD.⁴¹
- SJWD and Folsom engage in the Bureau of Reclamation’s “Accelerated Transfer Program” as authorized by the Central Valley Project Improvement Act (CVPIA) that allows delivery of the entire contracted CVP Project Supply to another CVP contractor without a consumptive use analysis.⁴²

Water transfers out of the region also provide opportunities to monetize water assets while simultaneously preserving regional water supplies for current and future uses under Water Code 1745.07. The water transfer methodology used by the collaborating agencies has historically been groundwater substitution transfers (like those in 2018 and 2020) and many regional agencies are investigating opportunities for water conservation transfers. The most important consideration in groundwater substitution transfers, and one that has been substantially vetted and monitored by the Sacramento Groundwater Authority, California Department of Water Resources, the State Water Resources Control Board (SWRCB), and United States Bureau of Reclamation, is the preservation of regional groundwater supplies before, during, and after the groundwater substitution transfers. Specifically, groundwater modeling and monitoring plans are a pre-requisite for developing and implementing regional groundwater substitution transfers.

Groundwater substitution transfers require an agency to forego using surface water supplies so that those supplies may be transferred and use groundwater supplies instead – whether pumped in their own system or delivered from an outside agency. There are details associated with these types of transfers relating to historical groundwater use and annual anticipated groundwater use that should be further assessed among the collaborating agencies to improve the supplies that could be made available for transfer. Improving the volume of supplies available for transfers improves the revenue generated from the water transfer. Maximizing a regional water transfer for participating agencies would have the following components (portions of these components have already been exercised for smaller regional water transfers):

- Utilize as much groundwater as practicable in SJWD, CHWD, OVWC, FOWD, and Folsom (if possible) customers in lieu of delivering surface water supplies. SJWD would then make surface water supplies available for transfer and share revenue with the participating agencies.

⁴¹ SJWD and CWD have initiated discussions on this potential exchange opportunity.

⁴² There is an open question about the dry year CVP Project Supply availability under the M&I Shortage policy after an accelerated transfer that deserves further investigation.

- Provide as much groundwater as practicable to CWD – potentially through deliveries from SSWD, CHWD and FOWD – to free CWD surface water supplies for transfer. CWD would share revenue with participating agencies.
- Coordinate City of Folsom and GSWC pre-1914 water right deliveries so that GSWC could maximize groundwater substitution in its service area and free GSWC’s and Folsom’s joint pre-1914 water supply for transfer. Folsom could also maximize CVP Project Supply use. GSWC and Folsom would share revenue derived from the transfer.
- SSWD would coordinate with City of Sacramento surface water deliveries to use SSWD groundwater in lieu of Sacramento’s surface water supplies. The City and SSWD would share revenues.

Groundwater substitution transfers, like those noted in this section, can be maximized with significant advanced planning. Normally, these transfers have manifested “in the year of the transfer” and agencies have spent time and resources rapidly compiling data and information to help the transfer succeed. Examining groundwater substitution transfer opportunities – and tiering these opportunities from investigations and reporting under Water Code 1011.5 – would allow the region to maximize opportunities as they arise. And, importantly, urban water purveyors have significantly more flexibility in developing and executing groundwater substitution transfers because, unlike agricultural water users, urban purveyors use water supplies all year – which makes the water assets more attractive for conveyance in periods outside the irrigation season.

As noted previously, regional revenue from the 2020 groundwater substitution transfer grossed approximately \$4.5 million. Improving collaboration among agencies could significantly increase the revenue numbers by including additional transferable surface water supplies like SJWD’s pre-1914, License and CVP Project supplies, Aerojet GET supplies, and Folsom pre-1914 and CVP Project supplies.⁴³ Incorporating these supplies could increase transferable water by 10,000 acre-feet if not more.

Urban water conservation transfers are a relatively new form of transfer and are being vetted with regulatory agencies and stakeholders. As noted in a previous section, water conservation manifests through quantifying actual reductions in indoor and outdoor uses as well as actual reductions in overall system losses (non-revenue water). Water Code section 1011(b) specifically states: “Water, or the right to the use of water, the use of which has ceased or been reduced as the result of water conservation efforts ... may be sold, leased, exchanged, or otherwise transferred pursuant to any provision of law relating to the transfer of water or water rights....” Although the total volumes of water that could be transferred under Water Code section 1011 because of ongoing water conservation activities is currently debated, there is real and quantifiable conservation savings in all three areas that could be made available for transfer for water supply reliability and water supply monetization opportunities. Moreover, the dual opportunity to both *preserve* and *transfer* conserved water supplies under Water Code section 1011 should be leveraged. As such, developing conserved water transfers requires a coordinated water conservation quantification (as noted above) and then developing the

⁴³ All of these identified assets have been successfully transferred in other situations.

transferrable conserved water assets – water rights and water contracts – that require regulatory concurrence.

Expand Place of Use of Water Assets

The participating agencies may also seek opportunities to expand the place of use of identified water assets. The important consideration in this effort is the legal basis of the water asset that would require the expanded place of use. For instance, CWD's surface water rights that are regulated by the SWRCB would require a formal petition process with SWRCB and California Environmental Quality Act (CEQA) compliance. Thus, if CWD and SSWD wanted to permanently include a portion of SSWD's service area in CWD's place of use, the SWRCB would need to fully support the effort and environmental impacts would require mitigation. PCWA and SSWD engaged in this process in the 1990's to include portions of SSWD in PCWA's water rights place of use – at a cost of several million dollars.⁴⁴ Alternatively, if Folsom sought to expand the place of use of its pre-1914 appropriative water right, it would need federal approval as well as CEQA and National Environmental Quality Act (NEPA) compliance analyses because that state water right is imbedded in a federal Central Valley Project (CVP) contract. Thus, expanding the place of use under existing water assets would require significant regulatory compliance.

Reorganization, however, may provide other expansion opportunities that could be expedited. For instance, even though SJWD's CVP Contract limits the place of use of SJWD's CVP Project Supply to "the Contractor's Service Area", the map in SJWD's CVP Contract may be modified with Reclamation's consent – a streamlined regulatory process – in support of a reorganization activity.⁴⁵ Similarly, CWD's place of use in its water rights is characterized as the "service area of Carmichael Water District" – which has expanded over time – that may have reorganizational opportunities that could be more easily addressed through a reorganization process. Nevertheless, the participating agencies could find opportunities to expand the place of use of available water assets through regulatory, contracting, and reorganizational efforts.

Engage in Specific Regulatory Processes

The regional water agencies have opportunities to collaborate in specific regulatory venues to further regional objectives. Specific regional objectives that have been discussed at various times include: improving regional water supply reliability, developing a drought water bank, and facilitating water transfer opportunities. The items listed below are specific actions that the participating agencies may consider to further longer-term water management objectives.

Legislative and regulatory actions that have been contemplated in the past include developing legislation that facilitates conservation-based water transfers; modifying rules to allow groundwater banking to be deemed a beneficial use of water (regardless of who extracts the water for use); and creating special area of origin rules for American River watershed water purveyors that promote collaborative water asset sharing and management. These sorts of actions may provide needed benefits

⁴⁴ Communication with Dan York in November 2020.

⁴⁵ Contract Between the United States and San Juan Water District Providing for Project Water Service and Facilities Replacement, 6-07-20-W1373-LTR1-P at Article 1(c).

to the region that would further support the asset preservation, water supply reliability, and asset monetization objectives among the participating agencies.

Additional opportunities for collaboration may extend beyond the legislative realm and be better addressed at the policy level. Specifically, ongoing actions that deserve attention include: (1) implementation of Reclamation's Municipal & Industrial Shortage Policy; and (2) management and implementation of groundwater substitution and water conservation transfers (specifically addressing the "Water Transfer Whitepaper" and related regulations and policies).

Reclamation's M&I Shortage Policy implementation lacks cohesive implementation. The participating agencies should work with the Bureau of Reclamation to address the water substitution component that is listed in the M&I Shortage Policy. The relevant language under "Historical Use Adjustments" is as follows: "At a Contractor's request, Reclamation will consult with the Contractor to consider an adjustment to their Historical Use. Historical Use adjustments are based on the following criteria: a) Population growth; b) extraordinary water conservation measures; c) Use of Non-CVP water; d) Other Unique or Unusual Circumstances." All of these potential adjustments related to the characterization of historical use should be fully vetted with the Bureau of Reclamation so that more beneficial use of CVP Project Supply water can be claimed in any given year which would result in increased water supplies in dry years and improved regional water supply reliability.

Water transfer activities also deserve attention among the participating agencies. Current regulatory actions at the staff level have created policies that impede the efficient implementation of groundwater substitution transfers and have stonewalled implementation of urban water conservation transfers. For example, the express provisions of Water Code section 1011 related to the transferability of conserved water have been resisted by state and federal staff based on unattainable technical reasons. Continued actions of regional purveyors to improve the opportunities for these transfers would support regional water supply reliability and improve opportunities for asset monetization.

Summary

The specific actionable opportunities described in this section would preserve water assets, improve regional water supply reliability, and generate revenue. The actionable opportunities would require additional technical analysis for purposes of implementation. Table 18 at the end of this section summarizes the collaboration opportunities, potential benefits, and collaboration methodologies.

Collaboration Methodologies

The water supply opportunities identified in this section could be implemented through a variety of collaborative mechanisms that have differing levels of sophistication. The purpose of this section is to describe each mechanism and to align the opportunities with the available mechanisms in Table 18.

Contract

There are many mechanisms to collaborate on water supply opportunities through contract. In fact, it is more likely that initial considerations related to many identified collaboration opportunities would evolve through some form of contract before alternative collaboration methodologies would be considered. Contracts have many levels of complexity from formal agreements that address specific detailed management activities to Memoranda of Understanding or Cost Sharing Agreements that allow flexibility in addressing the agencies' identified issues. The participating agencies may enter formal or informal agreements to support all opportunities listed in this section. Numerous forms of these agreements have been already executed among participating agencies. For example, CHWD,

FOWD, OVWC and Folsom have formal water supply agreements with SJWD that governs the rights and obligations of each party related to SJWD's water assets. Alternatively, CWD, FOWD and SSWD were part of a less-formal regional cost and revenue sharing agreement to develop and implement the 2020 groundwater substitution transfer. All these contracting mechanisms may be developed among the collaborating parties to meet the parties' objectives.

Option Contract

An alternative form of contract is an option contract – that allows an entity to essentially hold an opportunity to initiate action under the contract. Option contracts are more common for water supply reliability agreements where an entity will choose to initiate the contract to receive a water supply in a dry year but will forego initiating the contract where water supplies are otherwise plentiful. Option contracts would likely apply to a limited set of collaborative opportunities listed in this section.

Leverage Regional Venues like RWA, SGA, and the Water Forum

The participating agencies are involved in numerous venues that can be leveraged to engage collaborative opportunities. These venues have significant collaborative potential where participating members concurrently agree on a course of action. The Regional Water Authority (RWA), Sacramento Groundwater Authority (SGA), and the Water Forum are all established entities that facilitate regional coordination. For example, RWA occasionally engages in lobbying activities related to legislative or regulatory matters. RWA spreads costs among its member agencies to equitably distribute costs associated with the identified regional benefit in lobbying activities, water efficiency programs, grant applications and many other mutually beneficial endeavors. Similar activities may be available for opportunities considered in this section like modifying law, engaging on federal or state policy issues, or sharing costs for political activities with regional benefits. In addition, coordinated activities related to quantifying water conservation (Water Code Section 1011), assessing conjunctive use actions (Water Code Section 1011.5), and addressing wastewater use (Water Code Section 1010) may be supported through the regional venues. Accordingly, numerous collaborative opportunities identified in this section could be executed through one of the regional organizational entities.

Regulatory and Legal Action

The participating agencies may seek specific regulatory and legal actions to implement some of the identified opportunities. For example, if there were interest in CWD expanding its appropriative water rights place of use to serve water to other entities, the participating agencies could jointly participate in the SWRCB regulatory process and environmental compliance process to further the collaborative objective and share costs. Similarly, if the participating agencies sought to legally challenge a regulatory body's policy – like the M&I Shortage Policy or the short-term water transfer rules – then the agencies may join together to assert their concerns in the appropriate legal venue. This collaborative activity may also include additional contracting actions as noted previously.

Reorganization

Reorganization may also provide a mechanism to advance the water supply opportunities listed in this section. Reorganization would involve fully integrating the water assets shared between consolidating agencies to maximize benefits. The most recent reorganization example occurred in the formation of SSWD where Arcade Water District and Northridge Water District were combined. Administrative reorganization among two or more agencies should be distinguished from water supply coordination – where supplies belonging to a participating agency may be expanded for use only after regulatory and legal compliance. For example, combining CWD and SSWD does not necessarily mean that

CWD's surface water appropriative rights could be used in SSWD's service area. Although this changed use remains a possibility under CWD's water assets as noted previously, the two agencies would likely need to engage the SWRCB to expand the place of use of CWD's water assets. However, in other instances, reorganization may provide a facilitated mechanism to combine utility of water assets. As noted previously, combining SJWD and CWD might allow SJWD's CVP Project Supply to be used in CWD's service area after altering the use map per Article 1(c) and would certainly facilitate CWD's ability to use SJWD's pre-1914 supply. Accordingly, from a water supply perspective, careful consideration of the supply integration opportunities should occur before discussion of reorganization is considered.

Table 18: Summary Assessment of Options, Benefits, and Reorganization Methods

Collaboration Opportunity	Potential Benefits						Collaboration Methodology				
	Consistent Methodology	Coordinated Data Summary	Consistent Reporting	Asset Preservation	Regional Water Supply Reliability	Revenue Generation	Contract or MOU	Option Contract	Regional Venue	Regulatory or Legal Action	Reorganization
Water Conservation Quantification (WC 1011)	X	X	X	X	X		X		X		X
In Lieu Groundwater Use Quantification (WC 1011.5)	X	X	X	X	X		X		X		X
Polluted Water Use Quantification (WC 1010)	X	X	X	X	X		X		X		X
SJWD Water Delivery to CWD				X	X		X	X			X
SSWD Water Delivery to CWD				X	X		X	X			X
Folsom Water Delivery to GSWC and CVP Supply				X	X	X	X	X			
Groundwater Deliveries Among Agencies	X	X	X	X	X		X	X			X
Aerojet GET Diversions	X			X	X	X	X	X	X	X	X
Accelerated Permit Supply Acquisition	X		X	X	X		X	X	X	X	X
SJWD Conserved Transfer to SSWD	X	X	X	X	X		X	X		X	X
CWD Conserved Transfer to SSWD	X	X	X	X	X		X	X		X	X
SSWD Groundwater Substitution Transfer to CWD	X	X	X	X	X		X	X		X	X
Acquire and Use Aerojet and Temp Permit Supplies				X	X	X	X	X	X	X	X
SJWD and Folsom Maximize CVP Supply		X	X	X	X					X	
CHWD, FOWD, SJWD Groundwater Substitution Transfer	X	X	X	X	X		X			X	X
SJWD Use PCWA and Exchange pre-1914 Appropriative	X			X	X		X	X			X
SJWD and Folsom Use CVP Accelerated Transfer (CVPIA)	X			X	X					X	
Export Groundwater Substitution Transfer (1011.5)	X	X	X	X	X	X	X	X	X	X	X
Export Water Conservation Transfer (1011(b))	X	X	X	X	X	X	X	X	X	X	X
Expand Place of Use of Water Assets				X	X					X	X

Collaboration Opportunity	Potential Benefits						Collaboration Methodology				
	Consistent Methodology	Coordinated Data Summary	Consistent Reporting	Asset Preservation	Regional Water Supply Reliability	Revenue Generation	Contract or MOU	Option Contract	Regional Venue	Regulatory or Legal Action	Reorganization
Engage Legislative Advocacy				X	X		X		X	X	X
Engage Reclamation M&I Shortage Policy				X	X		X		X	X	X
Engage Regulatory Agencies' Transfer Criteria	X	X	X	X	X	X	X		X	X	X

Reorganization

This document explores options for further collaborations among the participating agencies in seven selected areas. In some cases, savings in the range of 5-15% are assumed when the participating agencies engaged in joint activities in a selected service area, as compared with status quo approaches, and assuming the same levels of service provision. In other cases, service level improvements rather than financial savings are possible. Calculating absolute savings is difficult given that each of the participating agencies has different levels of service. For example, some of the participating agencies have robust water conservation programs while other have minimal or no formal programming. This means that pursuing a collaborative venture could involve increasing or decreasing the current costs experienced by a given utility, depending on the level of service provided by each of the involved agencies. Using the example of water conservation again, DPMWD or RLECWD may end up paying more for water conservation programming if they were to enter a collaboration with SSWD or SJWD, because they would be elevating their current levels of service provided. They would be paying more but getting more than they could pursuing the service on their own. Because of these differences in service levels, the easiest collaborative opportunities to explore may be the ones between agencies that currently have common service levels. The majority of these service area savings can be realized without having to reorganize utility governance and combine utility organizations.

Even though most savings and service level improvement can be realized without having to reorganize and combine utility organizations, there are unique positives associated with reorganization. Progress on a broad range of service level enhancements across at least 80 areas of operational opportunity, as identified in the Activity 1 Report, could proceed with less negotiation and effort under a reorganized model. Savings estimated at conservatively between 5 and 15% might be achieved through larger contracts and scale benefits pursuing these 80 operational opportunities.

A reorganized approach could also reduce administrative and management overhead. These savings go beyond the estimated 5% to 15% achieved through larger contracts and scale benefits. For example, if the General Manager/Executive Director positions at each agency are consolidated, the fully loaded salaries plus benefits are reduced from 6 to 1. This alone could lead to a savings approaching one million dollars per year. It is estimated that on the over \$90 million spent on O&M every year across the participating agencies, reorganization might result in annual savings of between 8% and 20% if broadly pursued, or between about \$7 million and \$18 million dollars per year on the operating side alone.⁴⁶

There are additional benefits to reorganization. A larger ratepayer base can reduce credit risk and lead to more favorable borrowing and cash funding opportunities, particularly when combined with greater monetization of water supply assets. Decision making around regional management of water supplies could be made with less friction, allowing for maximal monetization and sustainability benefits. Greater scale could lead to greater influence in state level decision making with a unified rather than

⁴⁶ <https://www.infrastructureusa.org/strengthening-utilities-through-consolidation-the-financial-impact/>

fragmented voice. However, some may argue that a coalition of agencies speaking with a singular voice would achieve more impact.

There are potential negatives of reorganization. A loss of local control, and the dominance of voices from the largest population centers or loudest constituencies, could disenfranchise some people or groups or at least make them feel less represented. For those that choose different service levels, costs may increase and align less with their values and priorities. Pursuing reorganization also means spending time and money on the diligence needed to achieve the transition to reorganization, and potentially investments in infrastructure, equipment, materials, and standards alignment. There are also many challenges dealing with existing debt. Of course, there are the obvious political risks and chances for infighting during negotiations.

Regardless of the near- or long-term goals of the participating agencies, the path forward should include more collaboration to opportunistically align service levels, achieve cost avoidance, and optimize water supplies through scale benefits. If reorganization is pursued in the future among some agencies, then collaboration can build a bridge to success. Even if the participating agencies remain independent, more collaboration is a sensible goal with a range of opportunities. For the benefits of collaboration to scale, a spirit of engagement, trust, and cooperation must build beyond the bounds of this Study.

APPENDIX A:

Activity 1 Final Report



Sacramento Regional Water Utility Collaboration Study

Activity 1 Report

Description of the Current Environment

September 2020 - FINAL

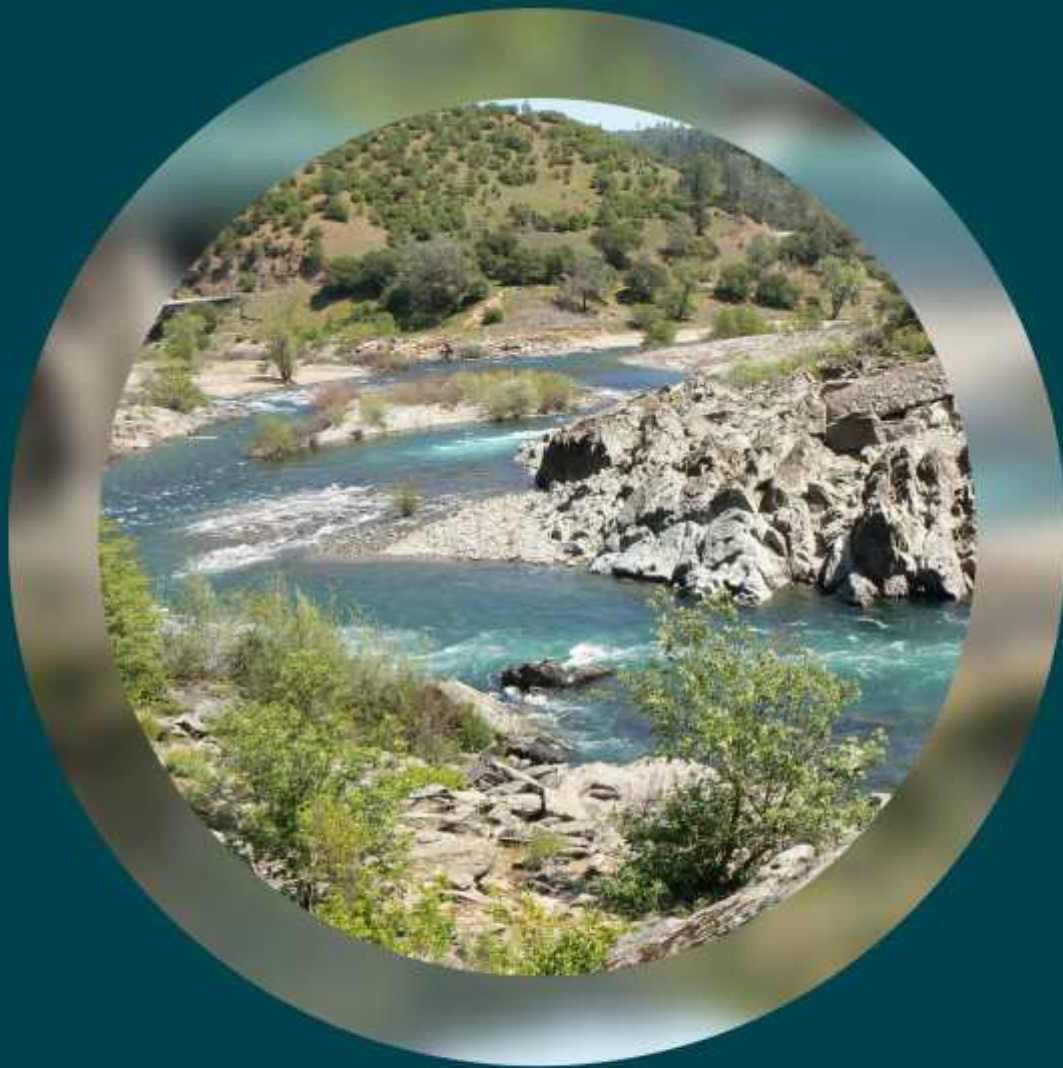


Table of Contents

- Summary 2
- Introduction..... 3
- Review of Participating Agencies 4
- Data and Information Summary.....6**
 - Carmichael Water District 8
 - Citrus Heights Water District 9
 - City of Folsom Environmental and Water Resources Department..... 11
 - Del Paso Manor Water District..... 12
 - Rio Linda / Elverta Community Water District..... 13
 - Sacramento Suburban Water District..... 14
 - San Juan Water District 16
- Preliminary Opportunities 18
 - Joint Contracting.....18**
 - Joint purchasing.....18**
 - Resources and staffing19**
 - Regional water supplies.....19**
 - Training and Standard Operating Procedures (SOPs)20**
 - Other Opportunities.....20**
- Collaboration Vehicles..... 21
- Regional Water Supply Collaboration Opportunities 22
- Collaboration Agencies’ Water Assets23**
 - San Juan Water District 25
 - Carmichael Water District 26
 - Citrus Heights Water District 27
 - Fair Oaks Water District..... 28
 - Orange Vale Water Company 28
 - City of Folsom..... 28
 - Sacramento Suburban Water District..... 30
 - Del Paso Manor Water District..... 31
 - Rio Linda Elverta Community Water District..... 31

Water Asset Collaboration Summary31
Conclusion 32

Summary

The Sacramento Regional Water Utility Collaboration Study (Study) is a collaboration among Carmichael Water District (CWD), Citrus Heights Water District (CHWD), the City of Folsom Environmental & Water Resources Department (City), Del Paso Manor Water District (DPMWD), Rio Linda/Elverta Community Water District (RLECWD), Sacramento Suburban Water District (SSWD), and San Juan Water District (SJWD) (together “the participating agencies”) to identify opportunities for increased collaboration. The goal of this Study is to identify opportunities for additional operational and financial efficiency, and to improve service provision to customers. This document is the first of three project deliverables and encompasses the activities for Study Activity 1 – Description of the Current Environment, inclusive of all subtasks. It provides an overview of the participating agencies’ operations, existing and past collaborations, and identifies the potential for additional activities.

Raftelis gathered information, including virtual interviews with senior representatives of each participating agency, about their organizations, stakeholders, and how they hope to benefit from collaboration. Data about the size and scope of participating agencies, as well as publicly available data from Orange Vale Water Company (OVWC) and Fair Oaks Water District (FOWD), are presented in this document. This Activity 1 Report also contains information about stakeholders, communications, and the current water resources situation, in addition to past and ongoing collaborative efforts.

There are and have been numerous collaborative ventures among the participating agencies. They include working together on water resources issues, joint contracting and procurement activities, and regional advocacy, often through the Regional Water Authority (RWA) and other entities. While all the entities are earnestly looking for opportunities to work together, there is a very strong desire for local control and independence among many of the participating agencies, including the smaller ones. Each reportedly has the minimum resources to accomplish their mission, given current water rates and exiting contractual arrangements for services. Most agencies do not describe immediate and/or urgent drivers that require forcing collaboration. Collaboration opportunities must therefore be viewed with the goal of reducing costs and improving services over the long term.

Raftelis has identified through interactions with the participating agencies numerous options for collaboration. Several categories of options are listed in this document. These will be studied further in the subsequent phases of the project. None of these options jeopardize the sovereignty of any agency, and if executed properly, should help increase efficiency, service levels or drive down costs. However, some compromises will likely be required to pursue them. Note that these collaboration opportunities do not limit future consolidation efforts. Instead, pursuing many of these opportunities will further enable the agencies to work together more easily, making any future discussions of additional collaboration that is potentially worth pursuing.

Introduction

The Sacramento Regional Water Utility Collaboration Study (Study) is a collaboration among CWD, CHWD, the City, DPMWD, RLECWD, SSWD, and SJWD (together “the participating agencies”) to identify opportunities for increased collaboration. of this Study is to identify opportunities for additional operational and financial efficiency, and to improve service provision to customers of the participating agencies. Increasing costs of living, evolving regulations, and increased competition for scarce water resources across the State mean that agencies must work together, more seamlessly and regionally, to provide reliable and affordable services.

This Activity 1 Report is the first of three project deliverable documents and encompasses the activities for Study Activity 1 – Description of the Current Environment and all associated subtasks. It provides an overview of the participating agencies’ current operations, existing and past collaborations, and provides an opportunity for additional collaborations. This document provides a high-level summary of submitted information from the participating agencies, and provides contextual, cultural, and key service level aspects. Attachments to this document include the Request for Information (RFI) memo (Appendix A), a table detailing the high-level data summary (Appendix B), the Communications Plan (delivered separately), and Project Charter (delivered separately).

This document is not designed to provide an exhaustive summary of each participating utility, nor of the details of every past and ongoing collaborative efforts. There are many other sources that provide high levels of detail about each participating utility and aspects of their operations. Again, this document is designed to provide an overview of the participating agencies and summarize past collaborative efforts in preparation for future project tasks.



Review of Participating Agencies

Raftelis gathered information from the participating agencies, generally following the guidelines in a provided Request for Information (RFI) – Appendix A. Following initial information gathering and in parallel with a review of the information, we conducted interviews with senior representatives of each participating agency to gather further information about each agency’s organization, stakeholders, and how they hope to benefit from collaboration with other agencies. The interviews were divided into two topic areas: Communications and Collaboration with internal and external stakeholders, and Operations. Interviews were approximately one hour with each agency on Communications and Collaboration, and included differing representation by agencies among the following roles:

-) Board members
-) Environmental and Water Resources Director
-) General Manager
-) Assistant General Manager
-) Executive Assistant to the General Manager
-) Public Information Officer
-) Communications Manager
-) Public Relations Consultant
-) Customer Service Manager
-) Utilities Section Manager
-) Operations Manager
-) Engineering Manager
-) Engineering Services Manager
-) Finance Director
-) Contract staff

In addition to the participating agencies, FOWD and OVWC, as wholesale customers of the SJWD are important stakeholders for regional collaboration efforts. Raftelis collected information from the public domain for these two agencies. We did not interview representatives from OVWC and FOWD as they have elected not to be involved at this point in the project. However, they and others may want to be included in the future at the discretion of the participating agencies. It is intended that a draft of this document is made available to them for their consideration and as a precursor to their possible formal engagement. If they decline to formally engage in the Study after review of the draft document, these additional agencies can be consulted as the participating agencies see fit but will not be included in subsequent analyses or reporting.

Note that other agencies in the region, including the Sacramento County Water Agency, which serves nearly 200,000 customers in the region, have also had discussions about participating in the Study. There are additional utilities such as various California American Water Company (Cal. Am.) and Golden State Water Company systems, Placer County Water Agency (PCWA), and the water systems for the cities of Sacramento and Roseville, that have collaborative relationships with the participating agencies in one or more areas. There are at least 27 different water entities serving Sacramento County, inclusive of this subset of seven participating agencies. Many of these agencies have resource sharing and collaboration arrangements with the participating agencies or that impact the participating agencies. In addition, there are several initiatives and agencies, such as the RWA, that work to form partnerships to address issue that impact the region and/or groups of utilities in and around Sacramento County. Figure 1 (see next page) shows a map of the participating water agencies.



-) The City of Folsom is the only municipal department participating in the Study, while all the other participants are independent water agencies, separate from municipal agencies. Note that OVWC is a private mutual water company and has a different structure and additional regulatory requirements compared to either a municipal department or a separate district.
-) The service populations of the participating agencies range from less than 5,000 (DPMWD) to nearly 183,000 (SSWD). This represents an opportunity as stratification in sizes, service levels, and resulting specializations can lead to areas of competitive advantage where joint contracting, sharing resources, and best practices can result in service level improvements, costs savings, or even revenue opportunities.
-) Sources of supply include a variety of surface water and groundwater resources with varying limits as several utilities have access to several different sources. This variation, if effectively managed as a region, can improve service reliability, hedge against droughts and additional water restrictions, and can provide additional long-term flexibility.
-) Differences among customer bases, including water rates, affordability, and desired service levels (and standards that result), must be carefully considered. Investments such as advanced meter technology, for example, may create significant capital costs, which can be barriers to entry. However, such investments may ultimately lead to lower operating costs and improved efficiency. Scale efficiencies from joint efforts can make some purchases feasible for areas where they otherwise might appear to be out of reach.

While these observations can help guide recommendations, it is only through mutual understanding that agreements to collaborate are achieved. To that end, the sections that follow provide an overview of each agency as they embark on this effort. In addition to helping capture topline organizational information that will be useful for future analyses in the Study, during Activity 1 we developed a preliminary understanding of each of the agencies:

-) **Context and Culture:** By context and culture, we mean the general history of each agency, customer base attributes, and ways of doing business, as reported by the participating agencies themselves. This provides perspective on what can be achieved through the Study.
-) **Services:** Operational highlights with a focus on the services that each organization currently engages in as a shared service involving regional partners.

The perspective that each participating agency brings to the Study, as formed by their experiences, ambitions, values, and resources varies quite a bit. However, it was clear from interviews that there was a strong spirit of cooperation and collaboration across all the agencies even before this Study began. Each agency had at least some experience working with neighboring agencies on collaborative efforts. And, the majority of this experience was characterized as positive.

While the baseline information detailed in Appendix B provides a surface level overview of each organization, the brief narratives below provide a more qualitative description of where each agency finds itself as we engage in this important effort. It is our hope that by sharing these perspectives we can improve mutual understanding and unlock a process that provides the best opportunity for additional collaborative efforts.

Carmichael Water District

Context and Culture

CWD serves a predominantly residential suburban community and largely sources its water from the American River, except during times of water scarcity when available groundwater wells are also utilized. CWD does not serve any major industrial customers that account for a large percentage of its water sales. Customers are engaged on water issues and are reportedly happy with the quality and services that CWD provides. CWD reports that customers like the small town feel of the District, and that, while they take pride in their independence, they are certainly open to collaborative opportunities that could achieve efficiencies through the sharing of resources.

As the Study progresses and in the context of the Covid-19 pandemic, CWD notes that employees will want assurances that collaboration efforts will not threaten their jobs. CWD has benefitted from revenue provided by an award-winning collaborative supply agreement involving contaminated groundwater at an industrial site (Aerojet Rocketdyne) and a private water supplier (Golden State Water Company).

As a result of their dual surface and groundwater supply, award-winning public-private-partnership supply agreement, and their mid-level size relative to peers, CWD has the potential to be an important voice in the Study as an organization that has seen the benefits of collaboration, while maintaining their independence.

Service Highlights

American River water is treated at a micro filtration plant that CWD invested in recently. During times of drought, when withdrawals from the river become limited, CWD is fortunate to have access to supply from groundwater wells. When the supply shifts more to groundwater, residents served by CWD may notice some minimal variation in the taste and properties of their water.

Current or past collaborative efforts noted are listed below:

-) During the recent drought and following State legislation there was increased information sharing among regional utilities on how they were approaching water efficiency and compliance.
-) CWD and FOWD are working to engage in a water supply sharing agreement and are installing metering now for transfers that will take place this summer.
-) There are interconnections with SSWD, FOWD, and CHWD.
-) The Regional Water Authority (RWA) shared outreach program involves 20 agencies, including CWD, and has water efficiency programs for customers such as rebates. The program includes cost sharing.
-) CWD is an active member of RWA, a joint utility organization.
-) CWD is supplied with 4.5 MGD of remediated groundwater from Aerojet Rocketdyne via a 7,400 foot, 24-inch diameter pipeline crossing the American River at Buffalo Creek. CWD then treats this water and delivers it back to Golden State Water Company. This work was funded in part by the RWA, via the State under the Governor's Water Action Plan (Proposition 84) and represents one of 17 Sacramento-area projects awarded \$9.7 million in California Department of Water Resources grants in 2014. The projects were designed to help shore up the area's water supply reliability during the drought and beyond.¹
-) Mutual Assistance Agreements with CHWD, DPMWD, FOWD, and SSWD have been helpful.

¹ <https://www.rocket.com/article/aerojet-rocketdyne-supports-american-river-pipeline-conveyance-project-dedication>

-) CWD is involved in several technical studies focused supply sharing between suppliers.
-) There have been conversations about sharing staff with three other agencies, including perhaps some HR functions.
-) There was a partnership with CHWD for transfer and removal of pipe.
-) CWD has purchased emergency materials with CHWD.
-) CWD is a participant in the regional bulk chemical purchasing effort.
-) CWD's prior engineer shared standard operating procedures (SOPs) with SSWD. CWD used studies and questionnaires to align procedures. They shared presentations with FOWD. However, some of the SOPs are already effectively shared because they are posted online, and the engineers will look at each other's documents.
-) There is a billing user group, though involvement has lessened as technologies have moved away from Cogsdale and diverged.
-) CWD was involved in metering conversations with other utilities, but CWD was ahead and has already selected a meter technology and vendor.
-) Sacramento County Environmental Health Management offered independent backflow testing as part of a regional program that had spawned out of Sacramento Area Water Works Association (SAWWA). CWD participated for a time, but ultimately brought this function in-house.
-) There are Water Forum meetings during dry years focused on reliability.
-) CWD has collaborated where they can on training through SAWWA, agencies may host but it is coordinated through SAWWA.
-) Target Solutions is an online training portal through the Association of California Water Agencies-Joint Powers Insurance Authority (ACWA-JPIA) (billing, PDP, risk management)
-) For specific equipment trainings, CWD will often invite other agencies.
-) CWD and other entities will share and seek consistency in messaging and practices within the region on power and energy, conservation, and regulatory issues, among other issues. It's shared because "it makes everybody's job easier."
-) Rate structure discussions between communities often feature discussion of conservation rates.
-) SJWD and CWD did a joint salary survey where the cost was shared.

Citrus Heights Water District

Context and Culture

Since its establishment as an irrigation district in 1920, CHWD's service area has evolved into a bedroom community, along with primarily shopping centers, parks, and schools. Though it remains technically an irrigation district by constitution, in the early 1990s the name was changed to a Water District. Despite sourcing approximately 90% of its supply through a wholesale agreement with SJWD, CHWD is firmly committed to remaining as an independent entity focused on water quality and cost optimization.

CHWD is open to collaborative opportunities that further their goals and those of others in the region, as evidenced by their participation in this Study and leadership on the joint meter study, but they remain cautious about the motives of larger regional peers and have found that some past attempts at working together have not always been successful. The District is careful to involve their own citizenry and business leaders in decision-making processes and formed a Customer Advisory Committee for a recent water main replacement initiative known as Project 2030, as well as for the ongoing meter study. This kind of direct local control is an important value for CHWD. For State advocacy on water issues, CHWD believes that many voices are more powerful and accountable than that of one large regional bureaucracy. CHWD hypothesizes that shared staff resource or joint contract opportunities may prove limited and unnecessary due to the abundance of private contractors available to serve water utilities in the area and the savings they feel are achieved through a more competitive and active contractor market. CHWD has also found that joint materials purchases can also be difficult due to varying preferences of products between communities.

Service Highlights

CHWD is the largest wholesale customer of SJWD and has independent access to six wells in addition to treated water from Folsom Reservoir. The community is largely built out, with the largest active project involving a redevelopment of a golf course into 200 additional residences. The meter study is a current operational focus and is moving from the technology review to implementation phase. CHWD uses c900 PVC pipes in their distribution system and does not have any storage tanks. They have SCADA systems on wells. They note that regional information sharing from SCADA systems could possibly be expanded.

Funding water main replacements presents a decision point for CHWD, as they determine whether costs should be borne more by current or future customers through bonded debt funding or PayGo funding. In general, the district feels that have been able to keep rates lower than many regional peers while maintaining water quality, but they are open to any opportunities that further those efforts as long as they do not threaten their ability to maintain local control of decision-making.

Current or past collaborative efforts noted are listed below:

-) RWA gets involved with grants administration, water efficiency programming, and legislative efforts and is a good vehicle for broad collaboration; they are an active member of RWA
-) They rely on SAWWA and many other outside and internal training resources.
-) CHWD provided comments on the consolidation studies involving SSWD and SJWD.
-) The regional meter study is being led by CHWD.
-) CHWD has 22 intertie agreements with other systems including those between other SJWD wholesale customer agencies (WCAs)
-) Water education in elementary school is a joint effort with SJWD and the WCAs.
-) RiverArc Study in the mid-2010s investigating diversion of water from the Sacramento River.
-) CHWD was involved with various pipeline capital projects in 1990s with other water agencies including the Cooperative Transmission Pipeline Project.
-) A joint bond issue for meters and wells with SJWD.
-) They worked with SAWWA on joint SOPs for purchasing many years ago, but they noted the process was challenging.
-) ACWA-JPIA, a joint entity, is used for insurance and risk management
-) Joint vehicle purchases for pickups and light duty trucks have occurred, in addition to using the State program pricing for fleet vehicles.

City of Folsom Environmental and Water Resources Department

Context and Culture

The Water Resources Department is the only member of the participating agencies that is part of a municipal government, which is ultimately overseen by a body of elected officials that must deal with a wide range of issues from public safety and parks to taxation and commerce. Being part of a municipal government already facilitates a considerable amount of resource sharing and collaboration, much of which is internal to the municipal government. The Department is open to external collaborative opportunities that could continue to improve service levels and identify areas for cost avoidance.

Particularly due to the effective conservation efforts that saved thousands of acre feet of water by driving down consumption per capita, the City currently has the water rights, contractual arrangements, treatment and pumping capacity, and distribution system they need to meet the needs of their service area now and into the foreseeable future. Their next major investment will be to ensure treatment redundancy is available as the City grows, particularly as a result of a major development project being built south of U.S. Route 50. Upon completion, the “South of 50” project will add about 11,500 connections on top of the currently serviced 22,000 connections. The completion of the South of 50 project will bring the City closer to their water treatment plant capacity limits, however, planned water treatment plant capital projects are currently in planning and design to address this. Under a worst-case scenario, they could presumably setup a supply agreement with Golden State Water Company or another agency.

Service Highlights

Even though the Department is larger in staff, as compared with some of the other participating agencies, they operate quite leanly and efficiently. The City uses daily reads from a Zenner advanced meter infrastructure (AMI) system for billing but wants to make sure they are on the right track as South of 50 comes online, and are as a result, actively engaged and eagerly awaiting progress on the shared meter study lead by CHWD. They aren't tied to a specific meter brand and would like to do a joint meter bid as a consortium. They need results from the October 2019 Meter Study as soon as possible because South of 50 homes are now being built. The number of dials, volumetric reading, and other specifications vary by community, which is leading to the slowness of the Meter Study.

The City has a GIS staff person that handles all departments and they have an engineering technician that is specifically for water and wastewater. Their Computerized Maintenance Management System (CMMS) system is Lucity and the same staffer that handles this system also manages work orders. A shift by Lucity to a web-based platform has created some operational challenges due to the difficulty with Lucity transferring existing City data into the web-based platform.

Current or past collaborative efforts noted are listed below:

-) Significant involvement in the meter study being led by CHWD.
-) The Department is an active member of RWA, a joint utility organization.
-) The Department is involved in a regional chemical purchase agreement. The effort has been “beyond amazing.” The effort, which started as a bay area consortium that got extended to Sacramento reportedly only costs around \$250 per agency to participate and results in significant savings.
-) The SJWD interconnection could provide 3 million gallons per day (MGD) if it were used.

-)] Some information sharing with systems local to their geography on hydraulics, but there have been no efforts on a unified regional hydraulic model.
-)] The Department participates in a statewide bid for various utility vehicles. A participating agency can use a common specification, which speeds and eases the purchasing process.
-)] The recently constructed intertie with Golden State Water Company (2019) would also provide up to 2.8 MGD of treated groundwater if it were used.
-)] The City uses the National Joint Powers Alliance (NJPA) and the California Municipal Awards Schedules (CMAS) for the purchase of utility service vehicles and heavy equipment (dump truck, side loader, backhoe).
-)] Working with RWA for a Consortium bidding of materials and services.

Del Paso Manor Water District

Context and Culture

DPMWD is the smallest participating agency, which serves a mostly residential area that is reportedly almost fully built out. This puts pressure on water rates, since there is little opportunity for system growth to offset increasing costs. DPMWD's activities have sometimes been met with resistance from active and engaged community advocates, both at Board meetings and in online forums. This has led to periods in the past of financial stress.

DPMWD is undergoing a period of transition. Following significant Board and staff turnover, a largely new staff of four is currently onboarding as SSWD handles operations on a contract basis. The Board and staff turnover have led to a degree of modernization that has stabilized rate increases. DPMWD is recovering costs and investing in infrastructure but their upgrade and replacement rate may be behind compared to others in the region. A plan to address aging infrastructure and to make sure their wells are maintained and compliant is needed. DPMWD runs off up to two wells, but they have six available and could probably produce more water and monetize it, which some Board members favor while others oppose. Overall, as the benefits of effective collaboration become clear, and with strong training for new staff, DPMWD is on the road to becoming a sustainable utility for its community.

Service Highlights

A private consultant is currently helping with system management, while SSWD handles most operating activities on a contract basis. The current situation has curtailed the District's ability to get involved with many external collaboration activities. The arrangement with SSWD may be scaled back or terminated once new staff onboarding is complete. A CPA firm was also hired to deal with accounting which was handled with QuickBooks. The District reports that 99% of customers are billed a flat rate, though there are a few meters for new construction and roughly 100 commercial customers that are all metered. Expanding metering is thought to be cost prohibitive other than for new construction and commercial where it is required, and somewhat controversial. A new General Manager arrived in July 2020. The new GM will be tasked by the Board with developing staffing and training plans and evaluating the SSWD agreement. The Board is open to collaborative opportunities that can offer savings.

Current or past collaborative efforts noted are listed below:

-)] Two by two meetings with SSWD on collaboration occur.
-)] DPMWD is a member of RWA, a joint utility organization.

-) Mutual aid agreements are in place and were very important to the District when many of the staff departed.
-) There is an operations agreement with SSWD.
-) DPMWD looked at outsourcing billing with SSWD, but it wasn't believed to be in their interest at the time

Rio Linda / Elverta Community Water District

Context and Culture

RLECWD has worked hard to move from a period of financial and infrastructure distress to one of stability over the last decade. The corrections that began 10-years ago entailed a state mandated loan and stipulated increases in funding to repair and replace infrastructure. More recently, RLECWD has significant, yet unrelated, Board and staff turnover. . In 2018 and 2019, half of the four Distribution System Operators departed to neighboring agencies for higher pay. The labor agreement negotiated in 2012 substantively decreased employee compensation, and subsequent labor agreements made only minor improvements. The District negotiated a collective bargaining agreement with modest compensation improvements in May 2019, thus narrowing the gap between RLECWD and the median compensation in the region. Recent Board Member departures were unrelated to one another and unrelated to the changes in staffing. Three Board Members departed in the spring of 2019. Two of the three moved out of the service area for reasons entirely unrelated to governance of the RLECWD.

Remaining challenges include addressing the regions highest fixed charge percentage (92%) and a rate structure that is incompatible with new state laws compelling efficient water use and restricting water losses. The District engaged a rates consultant this year to revise the rate structure and ensure the cost of service is aligned with rates moving forward. While most of the Board is fully supportive of efforts to achieve collaborative benefits, others mistrust the motives of the larger entities in the region and worry about the sovereignty of RLECWD.

Service Highlights

An example of the progress being made at RLECWD can be seen in their approach to capital planning where historically a fixed dollar amount for capital, not directly related to system needs, would get approved each year. Their asset management efforts are now increasingly professional. They seek to replace 1,000 feet of pipe per year to get closer to desired renewal rates. They would like to move to depreciation level investment, where they invest as much in new capital every year as they lose through depreciation.

Recent investments were made in a Customer Information System (CIS)/billing software, but they are open to discussions of outsourcing billing, nonetheless. RLECWD is required to do a lot of backflow testing due to a groundwater plume at McClellan Field and associated requirements for properties in that area. They are not involved in the regional meter study, because State mandates required them to upgrade to Neptune AMI meters; all the pump stations have a receiver antenna. This has shifted costs from meter reading labor to software and equipment maintenance contracts.

Attention to recent improvement efforts and perhaps a desire for autonomy has minimized the District's ability to get involved with many external collaboration activities.

Current or past collaborative efforts noted are listed below:

- J Member of the Sacramento Groundwater Authority (SGA) where they have been involved in the development of the Groundwater Management Plans, Basin Management Reports, and the Integrated Regional Water Management Plan together with RWA²
- J RLECWD is a member of RWA, a joint utility organization³
- J National Joint Powers Purchase Contracts for things like iPads
- J Outreach on strategic planning and community partnerships with school district and metro fire
- J SAWWA Monthly Training Luncheon⁴

Sacramento Suburban Water District

Context and Culture

SSWD is a large utility that was formed in February 2002, due to the consolidation of the former Arcade Water District and Northridge Water District, who were formed in 1954 and 1956, respectively. SSWD continues to make investments in several areas including infrastructure replacement and a conjunctive use program. SSWD is the largest participating agency that is reliant on groundwater. In addition, the District has contractual surface water rights to 26,064 acre-feet per year of surface water from the City of Sacramento water entitlement; and a contract to purchase up to 29,000 acre-feet of surface water per year from PCWA, with a 12,000 acre-feet take or pay caveat in the agreement. SSWD's conjunctive use program has resulted in approximately 230,000 acre-feet of banked groundwater.

Since 2005, SSWD has replaced approximately 100 miles of its distribution system at a cost of approximately \$110 million. SSWD is approximately 95% metered; however, is on schedule to be 100% metered by the state deadline of 2025.

Service Highlights

While SSWD's staff of 70 largely meets the agency's needs and has little excess capacity, there are select areas where SSWD may be able to offer services to other agencies, as well as areas where SSWD is interested in exploring opportunities for new shared FTEs. SSWD's Computerized Maintenance Management System (CMMS) is CityWorks. In 2007 SSWD chose to fully implement the CMMS system by placing a computer in each District vehicle.

Prior to this Study, SSWD engaged in an effort with SJWD looking at consolidation, which was largely motivated by opportunities to reduce operational redundancies and the potential for enhanced reliability that would be offered by having access to surface water during certain periods, SSWD recognizes that several of the participating agencies prefer to look at collaboration rather than consolidation, and agree that there are many opportunities to achieve savings or service level improvements as a region through collaboration.

Current or past collaborative efforts noted are listed below:

- J SSWD is an active member of RWA, where it is involved in regulatory and legislative affairs, grant preparation, and other regional services.
- J SSWD's Antelope Reservoir facility has a large building that is utilized for regional/state water related meetings/training (e.g., ACWA, SAWWA, AWWA, JPIA) at no cost.

²This was noted specifically by RLECWD but applies to most if not all participating water agencies.

³ Same as 3 above.

⁴ Same as 3 and 4 above.

-) SSWD utilizes JPIA for insurance, training, and legal support.
-) The utility participates in the regional Meter Consortium Project (in process).
-) SSWD has participated in joint legal services with other agencies.
-) SSWD was involved with RWA's joint chlorine purchasing program, but it reportedly didn't work for SSWD due to the large number of well sites.
-) Though few agencies have as many well sites as SSWD, they do share practices with Cal-Am and Sacramento County.
-) SSWD has provided emergency distribution inventory to a few regional agencies.
-) The District uses a master services agreement (MSA) vehicle for capital projects that is currently held by Veerkamp, Flowline and Domenichelli (contractor) that may allow others to participate. It has worked well for the District. The MSA is a three- to five-year contract and this is the third MSA and has been used for over 15 years.
-) SSWD and County of Sacramento developed a Paving Partnership for SSWDs main replacement program.
-) SSWD participated in regional water transfers in 2018 and 2020.
-) SSWD is involved in mutual aid agreements with CWD, RLECWD, SJWD/Wholesale Agencies, and DPMWD. Mutual aid recently turned into an operations agreement with DPMWD.
-) SSWD has 52 interconnections with CWD, DPMWD, RLECWD, CHWD, City of Sacramento, City of Roseville, County of Sacramento, Cal-Am Water Company, and Golden State Water Company.
-) Cal-Am is wheeling surface water from PCWA through SSWD.
-) Conducted a Phase 1 & 2A Study on Consolidation with SJWD.
-) SSWD working with SJWD for delivery of water during the Hinkle reservoir replacement design project.
-) SSWD and SJWD collaborated to design and construct the Antelope Pump-Back Facility during the drought.
-) SSWD and CWD are working to engage in a water supply sharing agreement, up to including CWD partial funding of a new groundwater well.
-) SSWD and SJWD recently completed a water supply sharing agreement to transfer approximately 4,000 af of SJWD's surface water supply to SSWD.

San Juan Water District

Context and Culture

As a retail and wholesale entity with excess water capacity during most periods SJWD brings a lot of resources to the region as well as a unique perspective to this Study. SJWD is by some measures the largest water agency participating in the Study. In some years, SJWD supply and/or treatment capacity is utilized by SSWD in addition to meeting the needs of the District's own retail and wholesale customers. SJWD has 33,000 acre-feet of combined pre-1914 and post-1914 water rights, a Central Valley Project Repayment Contract for 24,200 acre-feet, and an entitlement to Placer County Water Agency Middle-Fork Project water of up to 25,000 acre-feet. Taken together, in all but the most critically dry years, the District has the ability to transfer water up to the level of its historic use, which is well above current use. The District's water treatment plant (WTP) has a permitted maximum treatment capacity of 150 MGD, which is currently significantly greater than the capacity needed to meet the District's needs.

Over the last 10 years SJWD has invested significantly in its water treatment plant where work has included investments in rehabilitation of sedimentation and filter basins, and pipeline improvement projects. The last major hurdle of this capital cycle is the Hinkle Reservoir cover and liner replacement project; following this work plans call only for smaller projects in the subsequent years.

California's changing hydrology, and the need to enhance partnerships to optimize the use of surface and groundwater supplies contributed to purpose of the Phase 1 and Phase 2 consolidation studies that preceded this work on collaboration. Because of the infrastructure and operational connections among the participating agencies, SJWD recognizes that taking a broader approach to collaboration and potential integration could provide even greater benefits.

Service Highlights

Storage capacity of treated water is one concern at SJWD. It currently has just 66 million gallons of storage (of which only 42 million gallons of which is available before operational issues occur at SJWD pump stations), meaning that on peak summer demand days (which historically reached 90 MGD), if the WTP failed to produce water, SJWD would not have enough water to get through the day.

Another operational consideration is coordination of WTP production and system pressures with wholesale customer systems. As Wholesale demands vary throughout the day, storage in Hinkle Reservoir, which acts as a buffer between the WTP and the Wholesale system, fluctuates based on the demand and the WTP production. The WTP varies its production to maintain this buffer volume within the reservoir. Magnetic meters were installed in 2010 to measure flows to wholesale customers. These meters are located at the connection between the wholesale transmission mains and the wholesale agencies' retail service areas and are monitored through Supervisory Control and Data Acquisition (SCADA) system. The metering points allow for two-way flow measurement. There is no visibility of storage, groundwater well production, or retail customer demands in the wholesale agencies retail systems beyond the wholesale meters. Connectivity within the wholesale entities may allow enhanced WTP efficiencies and better system management

SJWD jointly sponsored the meter consortium with CHWD because SJWD is facing the need to replace its aging meter fleet, and sought a collaborative approach with similarly-situated neighbors. SJWD has been deploying Automated Meter Reading (AMR) technology, but is considering the possibility of installing an Advanced Meter Infrastructure (AMI) system. SJWD believes that the meter consortium is an example of the kind of success that can be furthered and used as a model through this Study.

Current or past collaborative efforts noted are listed below:

-) Parts are shared between systems; for example, sometimes an odd-size coupling is needed to fix a main break and they will borrow from another utility.
-) SJWD operates a regional water treatment and transmission system that serves many of the participating agencies, which includes a major transmission main that was jointly funded and constructed.
-) SJWD is an active member of RWA.
-) The Mag. meter project is a joint effort with the WCAs and SSWD.
-) The Hinkle reservoir cover and liner replacement project will entail integrated operations during the project with many of the participating agencies.
-) Safety and regulatory plans have been shared, for example, Covid-19 plan was shared with SSWD.
-) SJWD participates in various regional and statewide mutual aid agreements.
-) Drought project included flow control stations where there were some shared costs historically.
-) SJWD participated in the region's evaluation of the chemical purchasing consortium (now led by DSRSD in the East Bay), but ultimately SJWD secured better pricing separately.
-) Mainly contract lab water quality testing and have developed plans and protocols. Their plan was shared with other agencies – they may notice a bac-t spike first because they have SCADA that others don't.
-) Nine agencies in the region, including SJWD and other participating agencies, have been collaborating on responses to initiatives and proposed regulations, such as the Bay-Delta Water Quality Control Plan and associated Voluntary Agreement, the Bay Delta Conservation Plan, WaterFix, etc.
-) SJWD has participated in regional messaging on water conservation, given that the Sacramento region is typically perceived as one media market.
-) SJWD prepares and distributes the Consumer Confidence Report (CCR) for all of its WCAs, which includes groundwater information from the two agencies that have active wells.
-) Operations teams collaborate on issues that develop in the wholesale system such as operational challenges, new regulatory requirements, maintenance improvements, and lessons learned.

Preliminary Opportunities

During interviews and through document review, Raftelis reviewed existing collaborations; utility strengths and areas of need, and preliminary ideas on potential future collaborations or initiatives with the potential for expansion. We present these areas of opportunity collectively here for further discussion to stimulate thinking as we grow the list of opportunities, and ultimately prioritize them with the participating agencies as the Study progresses.

Joint Contracting

-) Analysis to identify contractors that work for multiple agencies, in anticipation of joint contracting and/or group price discounting
-) Joint “piggyback” contracting or joint purchase agreements with multi-year regional terms to achieve savings
 - o Paving
 - o Tank inspections/painting
 - o Well/pump rehabilitation
 - o Generator maintenance
 - o Cross-connection control program elements
 - o Leak detection (possibly using LiDAR once State Water Board releases new standards)
 - o Hydraulic modeling
 - o Infrastructure or well investments – design engineering
 - o Billing mail and print services
 - o Meter reading
 - o CityWorks Computerized Maintenance Management System (CMMS), CIS/billing or other joint software licensing
 - o Joint engineering designs if feasible
 - o Lab services / water quality testing
 - o Public information contracting (Watergrams, website material)
 - o Design consultant

Joint purchasing

-) Inventory analysis to identify joint purchasing opportunities to expand success on chemicals, vehicles, and hopefully meters (note that meters are not listed below as an initiative to collaborate on since meter purchases are already underway and therefore the participating agencies have indicated that meters are not a high priority for assessment as part of this Study).
 - o Pipes (ductile iron, PVC, or other) using master services agreements
 - o Generators
 - o Water mains and appurtenances
 - o Water loss analyses, or water audits, using billing data based on data optimization and uniform best practice approaches and benchmarking

- Infrastructure or well investments – materials, supplies
- Laptops and technology
- Vehicles
- Chemical cost comparison between Bay Area Consortium and SJWD deal

Resources and staffing

-) Identify and attempt to resolve any barriers to joint staffing due to union restrictions or differences in State PERS participation
-) Joint staffing or shared contracting (outsource)
 - Engineering, modeling, and design staff
 - Human resources staff
 - Conservation staff
 - Part-time regional water conservation staff once guidelines are clearer from State
 - Preventative maintenance program staff
 - Master gardener for residential vegetation management throughout region
 - Shared leak detection
 - Comprehensive operations agreements and select (functional) operations agreements
 - Billing and customer service
 - Meter installation/testing/replacement/reading
 - Joint technical specifications for vehicle or equipment bids
 - Water audits conducted by staff experts as opposed to through a joint contract
 - Joint SCADA resource for preliminary diagnosis and PLC maintenance
 - Regional training coordinator resource
 - Water operations staff
 - Sharing safety risk officer
 - GIS staff sharing
 - Customer service staff sharing
 - Sharing accounting staff
 - Purchasing coordinator – regionally or with State to document needs and timing and put together joint orders.
-) Equipment sharing (e.g. meter test bench, specialized vehicles and attachments etc.)
-) Joint warehousing or shared inventory
-) Facilities sharing for training, for example
-) Asbestos Cement Pipe (ACP) Safety and Disposal Training
-) Conflict of Interest and Ethics Training for Board/Council Members and Select Staff

Regional water supplies

-) Advancing Sacramento Groundwater Authority (SGA) groundwater bank and conjunctive uses
-) Mutual aid agreements
-) Intertie agreements
-) Expand inclusiveness of regional water transfer through the State Water Quality Control Board

-) Groundwater substitution transfers

Training and Standard Operating Procedures (SOPs)

-) Sharing training materials, opportunities, and best practices
-) Common materials and specifications
-) Standardization on training and best practices particularly for technology (meters, SCADA instrumentation, Lucity, GIS, tablets, CityWorks, Cogsdale, Next Door/Facebook/social media engagement etc.)
-) Leadership development training
-) Safety training
-) Engineering drafting training
-) Formally sharing and comparing policies and standard operating procedures (SOPs) using studies and questionnaires to identify best practices (areas of interest include staying current on regulatory impacts on SOPs, construction specifications, fire sprinklers, and plumbing codes, hydrant types / sizes, butterfly joints, internal controls vs government standards)
-) Share lessons learned from meter study with those not purchasing at this time

Other Opportunities

-) Expand information transparency and sharing
 - o Clearinghouse website for sharing information
 - o Joint calendar
 - o SCADA information transparency
 - o Formalize regional utility project timing coordination spearheaded by PG&E
 - o Providing water use estimates to each other or other financial forecasts
 - o Actively sharing planned fee schedules
 - o Sharing and benefit salary data
 - o Hold regular water operations meetings, particularly within wholesale systems
 - o Sharing job descriptions
 - o Share more information on well pumping levels within SJWD WCA systems to optimize management of Folsom Reservoir and SJWD water treatment plant (WTP), pressure etc.
-) Increasing regional meter operations or networks
-) Expand the meter consortium beyond materials purchasing focus
-) Joint bond issuances
-) Complete RWA cost benefit analysis and expand capacity and capabilities if it could be cost/savings justified
-) Clarify role of RWA in advancing all of the above⁵
-) Legislative footprint
 - o Local, State, and Federal

⁵Likely some of the collaborative efforts identified in this Study would best apply to an even larger set of agencies through RWA or other venues/agreements.

Collaboration Vehicles

Several entities already exist as facilitators of select elements of cooperation and collaboration in the region. Each entity serves a specific role in supporting the local water agencies. RWA is the largest, most active, and most relevant forum for the kinds of collaborative initiatives being discussed as part of this Study, though the SGA and others are certainly important players depending on the initiatives that are ultimately prioritized and pursued. As the Study advances it will be important to determine if, for example, the RWA should play a role, in the details of implementation and execution of identified collaborative initiatives.

Below is an inventory of the most notable entities that are facilitating collaboration:

Regional Water Authority (RWA)

-) Mission/Objectives: To serve and represent regional water supply interests and assist RWA members with protecting and enhancing the reliability, availability, affordability and quality of water resources.
-) Apparent Focus: Water Utility Collaboration and Advocacy

Sacramento Groundwater Authority (SGA)

-) Mission/Objectives: To manage, protect and sustain the groundwater resources of the basin in Sacramento County north of the American River consistent with the Water Forum Agreement for the benefit of the water users within the basin, and to coordinate with other water management entities and activities throughout the region.
-) Apparent Focus: Groundwater Management and Coordination

Sacramento Area Water Works Association (SAWWA)

-) Mission/Objectives: To advance and implement improvements in knowledge, design, construction, operation, and management of water utilities; To consider and solve problems in the production and distribution of safe, adequate water supplies; To promote the dissemination of water utility information in order to improve the understanding of the complexities of the industry; and to offer to members of the Association, their organizations, and to other appropriate persons or organizations the individual or collective water utility expertise that is available from members of the Association.
-) Apparent Focus: Water Utility Operator Training

Sacramento Water Forum (SWF)

-) Mission/Objectives: To provide a reliable and safe water supply for the Sacramento region's long-term growth and economic health; and to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River.
-) Apparent Focus: American River Stewardship

Regional Water Supply Collaboration Opportunities

The purposes of this section are to describe the fundamental water supplies available among the participating agencies and offer conceptual-level collaboration opportunities. Each participating agency has both active and dormant water assets that may support the collaboration effort. Water asset collaboration could help the agencies:

1. Protect surface water assets for current and future uses against claims of unreasonable use, forfeiture, and abandonment;
2. Maximize opportunities to utilize dormant surface water assets;
3. Improve dry year reliability of available water assets and protect against catastrophic supply outages;
4. Create consistent revenue generation opportunities;
5. Improve efficiencies in diversion, treatment, and conveyance facilities; and
6. Synthesize system operations to maximize opportunities to preserve water assets and reduce system costs.

It is important to note that the regional agencies have undertaken several studies that conceptually address baseline reliability issues. For example, the recently completed Regional Water Reliability Plan (RWRP) states that: “The RWRP is limited in scope to high-level identification of vulnerabilities, possible mitigation actions, regional conjunctive use potential, and interest in establishing a regional water bank – all as they may relate to increasing regional water supply reliability.”⁶ The RWRP lists 17 recommendations, including the establishment of a water bank and engaging with stakeholders and partners, as well as 106 structural and non-structural actions that would mitigate regional water supply reliability concerns. Importantly, the items considered in this water supply collaboration analysis address actions that go beyond improving regional reliability by addressing water asset preservation, financial benefits linked to coordinated water management and distribution, and water management flexibility among participating agencies. Considering the collaborative agencies’ water assets valuation approaches \$1 billion, without incorporating the economic activity spawned by reliable water supplies nor the value of the infrastructure used to divert, treat, and deliver these supplies, preserving and protecting water assets is critically important. Regional collaboration could provide an opportunity to protect the agencies’ water assets and leverage their economic value.

⁶ RWRP at 1-9, May 2019

Collaboration Agencies' Water Assets

The participating agencies have a diverse portfolio of water assets. These water assets consist of surface water rights, groundwater rights, and water entitlements that have independent limitations and opportunities. Each collaborating agency's water asset portfolio is unique and each collaborating agency's system operations are unique in the context of the water assets available to it. Table 1 depicts a simplified spreadsheet of water assets that highlights the key attributes of each collaborating agency's water assets.

As noted in numerous studies, the discordant characteristics of the regional water assets and the complicated regulatory processes related to the water assets, disincentivize the agencies from sharing stranded water assets that could otherwise be made available for use. Accordingly, the fundamental issues facing the collaborating agencies related to their water assets are as follows:

-) SJWD and CWD have surplus surface water assets that are at risk of loss if those water rights cannot be put to beneficial use.
-) There are limitations on the agencies' water entitlements – like diversion restrictions, place of use restrictions, and dry year restrictions – that diminish these assets' utility absent collaborative management.
-) The collaborating agencies' conserved water may have restricted redistribution potential based upon initial consultations with the regulatory agencies.
-) Water quality issues related to groundwater contamination, groundwater mineralization, and fluoride application constrain inter-agency water asset distribution.
-) The variations in water costs from differing sources render some water collaboration opportunities less desirable for collaborating agencies.

Taken together, these issues inhibit optimizing uses for the agencies' substantial surface water and groundwater assets.

Table 1: Participating Agencies Water Assets

Agency	Water Right	Contract/ Entitlement	Conveyance Agreement	Priority	Diversion Rate and # of wells	Diversion Period	Dry Year	Critical Year	Theoretical Max (AFY)
San Juan Water District	Pre-'14 S000656	Settlement Contract		1853	60 cfs	annual	33,000	33,000	26,400
	Appropriative L006324			02/11/28	15 cfs				6,600
	CVP Water Rights	Repayment Contract 2019				annual	M&I Shortage Policy	Health and Safety	24,200
	PCWA Permits 13856 and 13858	San Juan/PCWA Contract	Warren Act Contract EXP 2/2021	1963		annual	Subject to contract shortage policy	Subject to contract shortage policy	25,000
Citrus Heights Water District	SJWD CVP Settlement	SJWD Wholesale Service Agreement		1853		annual	Equitable manner and water shortage management plan	Equitable manner and water shortage management plan	Total Demand
	Groundwater				6 wells				8,500 estimated from UWMP
Fair Oaks Water District	SJWD water supplies	SJWD Wholesale Service Agreement		1853		annual	Equitable manner and water shortage management plan	Equitable manner and water shortage management plan	Total Demand
	Groundwater				6 wells				12,743 design capacity UWMP
Orange Vale Water Company	SJWD water supplies	SJWD Wholesale Service Agreement		1853		annual	Equitable manner and water shortage management plan	Equitable manner and water shortage management plan	Total Demand
	Groundwater				3 to 5 wells				At least 1,600 from photo of old map
Del Paso Manor Water District	Permits 11358, 11359, 11360, 11361 and D893	City of Sacramento Contract	City of Sacramento Contract	1958		annual	0 in months when plant can't operate		2,460
	Groundwater				8 wells				~6,600 based on 2009 master plan
Carmichael Water District	License 001387			09/18/15	15 cfs	annual	9,050	9,050	10,859
	License 008731			08/22/25	10 cfs	5/1-11/1	1,048	0	3,669
	Permit 007365			04/22/49	25 cfs	annual	15,000	0	18,099
	Aerojet Dry Year								2,200
	Groundwater				5 active wells and 3 inactive wells				~13,000 max 6,000 safe
Sacramento Suburban Water District	Permits 11358, 11359, 11360, 11361 and D893	City of Sacramento Contract	City of Sacramento Contract	1958		annual	0	0	26,064
	PCWA Permits 13856 and 13858	PCWA Contract	Warren Act Contract SJWD CTP Contract	1963		annual	0		29,000
	Groundwater				72 wells				~180,000 max 35,000 safe
City of Folsom	Pre-1914 Appropriative	Settlement Contract	Folsom Reservoir and Folsom South Canal	1851	60 cfs	annual	22,000	22,000	22,000
	Pre-1914 Appropriative	Lease of GSWC portion of right	Folsom Reservoir and Folsom South Canal	1851	60 cfs	annual	5,000	5,000	5,000
	CVP Water Rights	Folsom CVP WIIN Act Repayment Contract 6-07-20-W1372B-P	Folsom Reservoir			annual	5,250		7,000
	Ashland Area Contract	SJWD Wholesale Service Agreement	Folsom Reservoir				Equitable manner and water shortage management plan	Equitable manner and water shortage management plan	No limit
Rio Linda Elverta Community Water District					12 wells			Per well between 350 gpm and 2100 gpm	

San Juan Water District

SJWD's water assets include a pre-1914 water right, a licensed appropriative water right, a Central Valley Project Repayment Contract, and a water contract with PCWA. In total, SJWD's water assets include 33,000 acre-feet of water rights water and almost 50,000 acre-feet of contract water supplies. These surface water assets are used by SJWD and also made available to CHWD, FOWD, and OVWC through the SJWD's Wholesale Service Agreements. In addition to these water assets, SJWD has access to additional water that may be made available in the Central Valley Project (CVP) system called "215 Water". This CVP water is surplus Project Supply that is made available to CVP contractors when the system is in extreme surplus conditions.

SJWD's water assets have varying degrees of reliability. The water rights water is available in all year types subject to curtailment by the State Water Resources Control Board. SJWD's CVP Repayment Contracts, however, is less reliable because the volume of water available under the contract entitlement during shortage conditions is directly tied with historical use. As such, the availability of the CVP Project Supply in dry conditions requires that it be regularly used in normal and wet conditions otherwise the supply is unavailable in dry conditions. And SJWD's PCWA contract also has dry year limitations that could include temporary termination of use in Sacramento County, and a pro-rated allocation for supplies used in Placer County. In short, SJWD's preservation of its water assets and determinations of water supply in dry conditions, require that SJWD, its WCAs, and other regional agencies use SJWD's water assets. The collaboration effort is working to identify opportunities to put SJWD's surface water assets to beneficial use in all year types.

SJWD operates the diversion and treatment facilities for its water assets. SJWD diverts water from Folsom Reservoir through a shared intake facility and delivers the diverted raw water to the Sydney N. Peterson Water Treatment Plant (Peterson WTP). The Peterson WTP has a maximum capacity of about 150 million gallons per day (150 MGD) , with sustainable maximum production of 120 MGD. SJWD is working with other agencies in the region to utilize the full capacity of the treatment plant to deliver water into Sacramento and Placer counties.

Water treated at Peterson WTP may be widely distributed into the collaborative agencies' service areas. The priority is to deliver water to SJWD retail customers and the WCAs – FOWD, CHWD, the City, and OVWC. After this priority is met, SJWD may deliver surface water to SSWD and CWD through existing conveyance facilities. SSWD could receive water through the Cooperative Transmission Pipeline (CTP)⁷, and interties with CHWD, and CWD could receive water through its interties with FOWD, CHWD, and potentially its interties with SSWD. CWD recently discovered that a portion of its service area lies within the original place of use of SJWD's North Fork Ditch Company pre-1914 appropriative water right making delivery of this supply less onerous.⁸ Nevertheless, the opportunities to deliver SJWD surface supplies to a larger area, that includes additional collaborating agencies' service areas, could occur with existing infrastructure and minimal regulatory interference.

⁷ RLECWD is at the west end of the CTP/ATP

⁸ Water can also be delivered from SJWD to Rio Linda and Del Paso Manor, via interties with SSWD.

Carmichael Water District

CWD has three surface water rights, a water entitlement, and groundwater available to meet demands within its boundaries. In a normal year, CWD's water asset portfolio far exceeds its annual water demands – with approximately 30,000 acre-feet of available surface water supplies alone. But CWD's surface water assets have varying degrees of reliability based upon the constraints in its asset portfolio and the severity of the dry period. For the first time in its 100-year history, CWD's 1915 water right license was curtailed during the extreme drought in 2014 and 2015. And although CWD mitigated the reliability issue by acquiring alternative water supplies, the recognition of this vulnerability – including the future potential of increased curtailments of its surface water supplies – became real. As such, CWD is investigating opportunities to improve its dry year reliability through acquiring new supplies, drilling new wells, and exchanging water assets.

CWD needs to use its surface water supplies or it risks losing them. Putting CWD's significant volumes of water to beneficial use requires innovative thinking and coordination with neighboring agencies. In 2019, CWD and SSWD initiated a temporary conserved water transfer action in an effort to not only provide surface water to SSWD so that SSWD could bank groundwater, but also to preserve CWD's water assets for future uses. This temporary water action is ongoing and demonstrates the rationale for collaborative activities that CWD must undertake in order to preserve its surface water assets for future uses.

CWD's groundwater assets are also significant. CWD has five wells with a potential pumping capacity of approximately 13,000 AFY – although the safe yield maximum pumping capacity is closer to 6,000 AFY. Moreover, CWD has banked upwards of 17,000 acre-feet of groundwater under the regional Water Accounting Framework. CWD's groundwater pumping capacity limitations coupled with its system pressure issues and water quality concerns, reduce CWD's ability to rely upon its current groundwater assets in dry conditions. As such, CWD's water supply situation is essentially “feast or famine.” In nearly all years, CWD has ample water supplies to meet its needs – so much so that it leaves huge volumes of water as stranded assets. But in critically dry conditions, CWD's system limitations and its lack of surface water storage, make its supplies less reliable to meet its demands. The collaboration will help CWD address its reliability limitation in critically dry years and provide opportunities for CWD to deliver water assets to its collaboration partners.

CWD's infrastructure is also an asset that may be valuable in this collaboration effort. CWD operates the Bajamont Water Treatment Plant (Bajamont WTP) with a maximum capacity of 25 MGD. CWD uses a portion of the capacity in Bajamont WTP to treat and deliver surface water supplies to its customers. CWD recently entered into an agreement with Golden State Water Company to divert, treat, and deliver 5,000 AFY of Aerojet GET water (4.5 MGD) through the Bajamont WTP. CWD has some additional capacity at Bajamont WTP to divert and treat surface water assets that could be derived from alternative water sources. For instance, if SJWD were to consider delivering pre-1914 water supplies to CWD or SSWD, CWD could potentially divert and treat those supplies at the Bajamont WTP for delivery within CWD's service area or through CWD's interties with SSWD, FOWD, or CHWD. This type of collaborative opportunity will be further explored in this effort.

CWD also possesses a dormant water diversion facility on the American River – the Ranney 4 Collector (Ranney 4). Ranney 4 stands in the American River near Ancil Hoffman Park and could be activated, with some necessary alterations, to divert and deliver water from the American River into CWD's service area. All CWD's water rights and entitlements may be diverted at this facility. CWD is investigating the opportunities to rehabilitate this facility, potentially augment its water treatment capacity, and connect Ranney 4 into CWD's distribution system.

Citrus Heights Water District

CHWD's water assets consist of a contract entitlement with SJWD to receive treated surface water and groundwater supplies derived from its current six wells. CHWD is planning for four more wells and is considering Aquifer Storage and Recovery (ASR). CHWD's contract entitlement with SJWD enables CHWD to access any of SJWD's surface water supplies. As such, CHWD provides a needed water demand for SJWD's surface water supplies so that SJWD may demonstrate beneficial use of those supplies and improve its dry year supply reliability by using supplies that would otherwise be dormant. CHWD's dry year reliability is tied to SJWD's water supply reliability in that CHWD has a reduced surface water allocation under the wholesale contract under certain conditions. CHWD's demand is predicted to remain at its current level or perhaps decline slightly into the future and the ability to access and collaborate on the use of CHWD's and SJWD's water assets may provide mutually beneficial opportunities for both agencies.

An ongoing issue between the wholesale customer agencies and SJWD is the increasing cost to acquire SJWD surface water. Accordingly, the need for CHWD to use SJWD water in order to preserve those water assets is juxtaposed against a CHWD's use of its groundwater assets. The collaboration effort may provide some guidance to help address the relevant conditions that create this tension.

CHWD also pumps groundwater to serve to its customers. The wells are typically operated on a one well per week rotational basis during normal maintenance / readiness-to-serve protocols. The total yield from the current well system could be upwards of 13,000 acre-feet annually (although insufficient for Max. Day) which could serve CHWD's projected future demand while allowing CHWD to weather critically dry conditions with the wholesale contract limitations

Fair Oaks Water District

FOWD is not a participating agency in the collaboration process but its water assets and uses may be an important aspect of the collaborative findings in this Study. FOWD is like CHWD in its access to SJWD surface water through a Wholesale Agreement and its ability to provide groundwater to meet its needs. FOWD helps SJWD demonstrate beneficial use and improve its dry year reliability by using SJWD surface water assets. FOWD contests SJWD's water costs and seeks to reduce costs by using more groundwater in lieu of surface water. FOWD's 2015 UWMP notes that it has six wells with a capacity of up to 12,500 acre-feet of groundwater pumping – enough to meet its entire future demands. There are outstanding questions about the viability of meeting all FOWD demands with groundwater. The collaboration effort will incorporate FOWD's current activities in an effort to identify opportunities to create additional regional benefits.

Orange Vale Water Company

Like FOWD, OVWC is not a participating agency in the collaboration process. However, OVWC's water assets and uses may be an important aspect of the collaborative findings. OVWC is a retail agency, like CHWD and FOWD, that derives nearly all its annual water supplies from SJWD's surface water assets. And although OVWC has access to groundwater, its wells are dormant, and it relies upon SJWD wholesale water deliveries to serve its demands. OVWC's access to groundwater, however, may provide an opportunity to help distribute limited dry year surface water supplies in order to increase long-term regional reliability. The collaboration effort will incorporate OVWC's current activities in an effort to identify opportunities to create additional regional benefits in this collaboration Study.

City of Folsom

The City of Folsom (Folsom) has its own water asset portfolio that consists of a pre-1914 appropriative water right for 22,000 acre-feet of surface water, a lease for an additional 5,000 acre-feet of water under the same appropriative right, and a CVP Project supply for 7,000 acre-feet of water. Folsom anticipates using approximately 31,000 of its 34,000 AF of surface water supply portfolio and is looking for opportunities to improve its water supply reliability in dry and critically dry water years

Pre-1914 appropriative water right for 22,000 acre-feet per year

The City's 22,000 acre-foot entitlement is based on a pre-1914 appropriative right from the South Fork of the American River established by the Natoma Water Company in 1851. Natoma Water Company's original pre-1914 water right established a maximum diversion rate "to fill a Canal Eight feet wide and Four feet deep with a current running ten miles per hour." This correlates to a diversion rate of 60 cubic feet per section (cfs) and a maximum allocation of 32,000 acre-feet per year. The City acquired its 22,000 acre-foot entitlement under a 1967 co-tenancy agreement with what is now Golden State Water Company (GSWC). The City's 22,000-acre-foot portion of the pre-1914 right is conveyed by the Bureau of Reclamation to the City under Contract No. 14-06-200-5515A. There are no dry-year shortage terms in Contract No. 14-06-200-5515A.

Pre-1914 appropriative water right for 5,000 acre-feet per year

The City's 5,000 acre-foot entitlement is also based on Natoma Water Company's pre-1914 appropriative water right from the South Fork of the American River. In November 1994, the City executed a contract with Southern California Water Company-Folsom Division (SCWC) – which is now Golden State – under which the City acquired the right to use 5,000 acre-feet of water per year of the 10,000 acre-feet per year that SCWC had retained under the 1967 co-tenancy agreement. The City's 5,000 acre-feet entitlement is conveyed by the Bureau of Reclamation to the City under Contract No. 14-06-200-4816A. There are no dry-year shortage terms in Contract No. 14-06-200-4816A.

Central Valley Project (CVP) contract entitlement for 7,000 acre-feet per year

On February 28, 2020, the City executed a repayment contract with Reclamation for 7,000 AFA of Central Valley Project (CVP) water supplies. This water is derived solely from American River water rights held by the Bureau of Reclamation for diversion and storage at Folsom Reservoir. Reclamation's CVP water rights are junior to water rights that existed prior to the development of the CVP. In dry years, the water supply is subject to Reclamation's Municipal and Industrial Water Shortage Policy (M&I Shortage Policy). Under this policy, water supplies are reduced from a baseline volume depending upon the inflow and storage conditions

Contract with San Juan Water District

The City has a contract with the San Juan Water District (SJWD) for water use on City lands on the north side of the American River. There are two areas located here: the Ashland Area and the American River Canyon Area. In the Ashland Area, the City controls the water conveyance facilities, but the water provided to those facilities is delivered by San Juan Water District. In the American River Canyon Area, SJWD provides all water services. Water service to these two areas is subject to the San Juan Water District and City of Folsom Wholesale Water Supply Agreement (Agreement) that was signed on September 26, 2007 and the subsequent Amendment dated January 1, 2011. The Agreement covers water service to the Ashland Area as well as the American River Canyon Area.

Under this Agreement, SJWD provides surface water assets to the City to serve the Ashland Area. SJWD agrees to serve the Ashland Area in the City and could reduce allocations to the City in times of water shortage. It would reduce its deliveries to the City in pursuant to SJWD's "Surface Water Supply and Water Shortage Management Plan."⁹ At this time, SJWD has significant water assets that are very reliable, and curtailment of the water supplies is unlikely.

⁹ Article 6 H San Juan Water District and City of Folsom Wholesale Water Supply Agreement as amended by Amendment 1 to San Juan Water District and City of Folsom Wholesale Water Supply Agreement dated January 1, 2011.

Sacramento Suburban Water District

SSWD uses surface water assets derived from its contract entitlements with regional water agencies and groundwater supplies extracted through its seventy-two wells in its service area. SSWD has access to the City of Sacramento's (City) surface water supplies pursuant to a water supply contract as well as access to PCWA's surface water supplies under a separate water agreement. SSWD regularly takes delivery of both water supplies when the supplies are available. SSWD has recently considered the cost implications of accessing these supplies and has reduced reliance on these supplies when the costs are too high. Importantly, the PCWA supply is less reliable in dry years while the City supplies have become more reliable¹⁰ – where SSWD retains access to the supplies through interties with the City even if “Hodge Flow” restrictions are activated on the American River.

SSWD has an extensive groundwater system with seventy-two wells available to produce groundwater supplies. However, even though SSWD is legally a single urban supplier it is, for all practical purposes, operated as two distinct water systems. Arcade Water District's consolidation with Northridge Water District to form SSWD brought together two agencies that operated with two different perspectives. The reason for SSWD's dual operations is because in the Southern Service Area, water supplies are treated with fluoride whereas in the Northern Service Area – the former Northridge Water District – the water supplies are devoid of fluoride. Because of this difference in water treatment, the water supplies developed in each area may not be easily commingled.

As a participating collaborating agency, SSWD has a significant water demand and the opportunity to use additional surface water supplies from its neighboring water agencies. Although SSWD is contained in the place of use of PCWA's and the City's surface water assets, it may be beyond the place of use of SJWD's and CWD's water assets. Both SJWD and CWD are working on delivering surface water supplies to SSWD in order to expand potential uses of each agency's surplus surface water assets. Importantly, SSWD presents an opportunity to improve groundwater banking opportunities through in lieu recharge that could be useful in furthering the regional groundwater banking objectives¹¹ identified in the RWRP. The collaborative Study will further explore these opportunities.

¹⁰City water cost began at \$116 af and is now at \$598 af. SSWD has taken surface water when the City has conducted pilots and greatly reduced the cost to \$150 af.

¹¹SSWD has a very robust conjunctive use program to the extent it has banked approximately 230,000 af of groundwater. SSWD wishes to enhance that program in order to consistently utilize its infrastructure.

Del Paso Manor Water District

DPMWD primarily uses groundwater to serve its customers and it retains access to the City's surface water supplies through an agreement. DPMWD's 2009 Water Master Plan indicates that it has eight wells with a total capacity of about 6,600 acre-feet per year (AFY). DPMWD's access to groundwater supplies far exceeds its demands that approximate 1,500 AFY. DPMWD is working with neighboring agencies, in particular SSWD, to help reduce its overall costs for water delivery to its customers. DPMWD's water assets and opportunities will be further considered in this collaboration effort.

Rio Linda Elverta Community Water District

RLECWD primarily uses groundwater to serve its customers and has interconnections with Sacramento Suburban Water District that may allow it to obtain alternative supplies. RLECWD's 2015 Urban Water Management Plan indicates that it has twelve wells. Each well has differentiated capacity ranging from 350 gpm to as high as 2,100 gpm. RLECWD has extracted and used between 2,000 and 3,000 acre-feet per year over the course of the last ten years derived from its well system. The interconnection between SSWD and RLECWD could allow water assets from SSWD's system to move into RLECWD's service area. SSWD has access to both surface water and groundwater supplies from a variety of sources. As such, this assessment will identify potential water supply options that may improve regional water asset preservation and use.

Water Asset Collaboration Summary

The collaborating agencies have significant surface water and groundwater assets that could be better utilized. The dormant surface water supplies as well as supplies protected through active water conservation, could be better leveraged by the collaborating agencies. Specifically, increased surface water use by all of the agencies would (a) protect the region's water assets against future loss; (b) improve dry year reliability of the available supplies; (c) augment groundwater supply conditions; and (d) create opportunities to generate more revenue through water transfers and exchanges both within and beyond the American River watershed. The collaborative Study will further refine the collaborative opportunities available among the participating agencies to address these leveraging objectives.

Conclusion

Each of the participating agencies has a long history of serving their customers and considerable roots in their communities, some going back well into the 1800s. While several have experienced challenges with water rates, staffing, water resources or other issues, each reportedly now has the minimum resources to accomplish their mission, given current water rates and existing contractual arrangements for services. The agencies do not describe immediate and/or urgent drivers that require forcing collaboration. Collaboration opportunities must therefore be viewed with the goal of reducing costs and improving services over the long term. They must be elective and foster partnerships, rather than create divisions. While all the entities are earnestly looking for opportunities to work together, there is a very strong desire for local control and independence across most of the participating agencies, including the smaller ones that have relatively fewer resources.

Raftelis has identified through interactions with the participating agencies numerous options for collaboration. Several categories of options are listed in this document. They include working together on water resources issues, joint contracting and procurement, and regional advocacy, often through the Regional Water Authority (RWA) and other entities. These partnership organizations may create additional opportunities. These will be studied more in the subsequent phases of the Study.

None of the collaboration options identified jeopardize the sovereignty of any agency, and if executed properly, should help increase efficiency, service levels and/or drive down costs. However, some compromises will likely be required to pursue them. Note that these collaboration opportunities do not limit future consolidation efforts. Instead, pursuing some of these collaboration opportunities will further enable for agencies to work together more easily, making any future discussions of more comprehensive collaboration easier.

APPENDIX A:

Request for Information



MEMO

To: Sacramento Region Water Utility Collaboration/Integration Study

From: Seth Garrison

Date: April 29, 2020

Re: Preliminary Request for Information

For this study there are several areas of focus where Raftelis seeks information to support this project's assessment work. This information is being requested of the utilities participating in the Regional Water Utility Collaboration/Integration Study. To support our initial screening and assessment work, we seek information pertaining to:

- Area 1. Budgets: Financial Data
 - a. Current budget
 - b. Budget structure and allocation of costs
- Area 2. Organization and Staffing: (Organizational/Management/Staffing)
 - a. Number of staff
 - b. Organizational structure
 - c. Roles and responsibilities
- Area 3. Services: (Services and Customers)
 - a. # Customers/Accounts
 - b. Services that are self-provided (operational and support)
 - c. Services that are contracted (operational and support)
 - d. Services that are centralized or joint contracted across participants
 - e. Services that are "wish-list" services
- Area 4. System Overview: (System Data)
 - a. Overview description of the water system
 - b. Number and type of facilities
 - c. Buried asset information

As the project evolves, we anticipate needing more detailed information of each of the areas of focus from above including some or all of the information as outlined below.

Financial Data:

1. Comprehensive Annual Financial Reports for the most recent available 3 years.

2. Detail level revenue and expense budgets for the water system for the most recent budget year available. Please provide budget detail by department or water system function (e.g. source of supply, treatment, distribution operation and maintenance, customer service and billing, administration, etc.).
3. Current capital improvement plans (5-year or 10-year plans, if available).
4. Latest financial plan projection or rate studies completed for the water system, if any.
5. Current schedule of water rates.

Organization/Management/Staffing Data:

1. Copies of latest strategic plans in connection with the water system or the municipality in general, if available.
2. Organizational chart showing staffing positions in connection with the water system.
3. List of staff associated with the water system by position title. Where staff responsibilities are split between water system and non-water system functions, please identify the % of staff time dedicated to the water system.
4. Position descriptions for each of the staff positions identified above, if available.
5. Compensation and benefit cost information in connection with each of the staff positions identified above.
6. Copies of latest staffing studies in connection with the water system or the municipality in general, if available.
7. Copies of any written standard operating procedures (SOPs), policies, procedures, and workflow processes associated with the water system, if available.
8. Any benchmarking or measurements data collected by the utility or any data on current levels of service and goals such as the number of water mains.

Services and Customers:

1. Copies of any outsourcing contracts or existing intermunicipal agreements in connection with the water system.
2. Any customer surveys or feedback instruments showing customer preferences, opinion of service levels, etc.

System Data:

1. Summary information and statistics for the water system (e.g. source of supply, average and max day water demands, number of pumping stations, amount of system storage, miles of transmission & distribution piping).
2. Summary water customer information (customer accounts and billed consumption by type of customer, historical and projected customer account and consumption trends).
3. A map of the water system showing major system component locations.
4. Copy of the latest annual operating reports for the water system (last 3-years, if available).
5. Any master planning documents showing planned upgrades, changes, new ventures, etc.

6. A description of the billing/Customer Information System (CIS), key vendors and any outsourcing/partnership arrangements, such as relationships with a bill printing or mailing vendor.
7. Available summary statistics on performance of systems and billing/CIS activities such as levels of unaccounted for water, water quality violations, number of estimated readings, meter read rate, aged billing AR, etc.
8. Breaks per 100 miles of pipe, average duration of an outage, etc.
9. Any prior study reports or associated analysis that touched on collaboration or consolidation opportunities, such as the Phase 1 and Phase 2A reports.

Thank you for your efforts in responding to this request in a timely fashion. Please do not hesitate to reach out to me if you have any questions at 207.303.0138 or sgarrison@raftelis.com.

APPENDIX B:

Organizational Summary



Appendix B: Organizational Summary

	CWD	CHWD	Folsom	DPMWD	FOWD	OVWC	RLECWD	SSWD	SJWD
Structure & Governance:									
Type of Agency	Irrigation District	Irrigation District	Municipal Department	County Water District	Irrigation District	Mutual Water Company	County Water District	County Water District	Community Services District
Governance Entity	Board	Board	City Council	Board	Board	Board	Board	Board	Board
Retail / Wholesale	Retail	Retail	Retail	Retail	Retail	Retail	Retail	Retail	Both
Year Entity Established (as currently incorporated)	1916	1920	1946	1955	1917	1896	1948	2002 ¹²	1954
Size:									
Employee Full-Time Equivalents (FTE) ¹³	27	35	34.75	4	28	4	10	70	48
Connections	11,521	19,944	21,654	1,600-1,797	14,241	5,500	4,628	46,268	10,700
Residential Retail	11,000		19,511	1,500-1,697					
Non-Residential Retail	521		2,143	100					
Wholesale	1 (GSWC)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4 (40,075)
Service Pop.	40,000	67,000	70,000	4,967	36,200	15,200	13,400	182,500	154,781
Permitted Treatment Capacity (million gallons per day, MGD)	22 (surface) 9.4 (wells)	11.6 (wells)	50 (surface)	wells	wells		wells	115 (wells)	150 (surface)
Average Day Demand (ADD) (MGD)	12.31 (includes 4.5 that goes back to GSWC)	14.57 (5 year average)	17.1		8.40			27.3	40
Maximum Day Demand (MDD) (MGD)	24.62	23.5	29.1		16.1		8.9	90.4	
Storage Capacity (MG)	6	0	33.2	0	3	0	1.3	15.8	66
Infrastructure:									
Source of Supply	American River (primary) and wells; GSWC provides 4.5 MGD via American River	Folsom Reservoir (SJWD), plus 6 CHWD wells	Folsom Reservoir, SSWD groundwater from the Antelope Pump Station	Wells	Folsom Reservoir (SJWD), Wells	Folsom Reservoir (SJWD), SSWD groundwater from the Antelope Pump Station	Wells	Wells, and purchased surface water contracts	Folsom Reservoir, SSWD groundwater from the Antelope Pump Station
Surface vs Groundwater (%)	75/25 (seasonal May-Sep)	90/10	100/0	0/100	?	100/0	0/100	57/43 ¹⁴	100/0
Treatment Type	Plant: membrane filtration, clearwell, and chlorine contact chamber		15 MGD conventional pre-treatment system and Actiflo system with two 20 MGD trains fed by a dry dynaBLEND polymer system.					Fluoridation in South Service Area	Two flocculation-sedimentation basins, and two filter basins
Miles of Pipe	154.25	241	305		183.05		84	698	222
Type of Pipe	Steel (17%), asbestos cement (60%), PVC (10%), and ductile iron (13%)	ACP 63%, PVC 24%, DIP 7%, STEEL 6%	Cast iron and asbestos cement in older areas, PVC, ductile iron, and steel in newer developments				Asbestos cement (majority) and some ductile iron and PVC	Asbestos cement, steel, ductile iron, cement mortar lined, and PVC	Asbestos concrete, steel, ductile iron, and PVC
Financial:									
Revenue (2019)	\$12,634,608	\$15,340,476	\$13,912,610		\$9,599,201		\$2,590,786.00	\$48,078,000	\$27,005,500
Operational Expenses (2019)	\$7,101,576	\$13,666,214	\$14,234,824		\$9,760,382		\$1,803,560.00	\$23,241,000	\$20,020,600
% Debt Service Coverage Ratio	250%	267%	277%		2981%		205%	366%	188%

¹²Consolidation of Arcade and Northridge Water Districts.

¹³Excludes Board of Directors

¹⁴This varies depending on availability of surface water.

	CWD	CHWD	Folsom	DPMWD	FOWD	OVWC	RLECWD	SSWD	SJWD
Days Cash on Hand	549	TBD	612				272	653	313
Median Household Income	\$60,466	\$59,008	\$109,762	\$58,456	\$81,462	\$79,532	\$62,740 / \$71,000	\$48,961 - \$81,462	\$53,933 - \$132,034
Rate Structure	Uniform rate structure	Bi-monthly service charge, plus a charge per ccf.	Tiered rate structure (3-tier)	Flat rate for 99% of customers varies by lot size, and a flat service component	Uniform rate structure	Uniform rate structure	Uniform rate structure (with drought rates)	Mix of flat service chart accounts and tiered rate structure for metered accounts	Uniform rate structure
Monthly bill for typical household¹⁵	\$79.51	\$71.09	\$50.03	\$58.25	\$47.43	\$44.54 ¹⁶	\$81.27	\$91.89 ¹⁷	\$83.75

¹⁵Includes 1” meter service or fixed charges. Based on a family of 4 and 143 gallons per capita per day, or about 23.26 ccf per month as per: https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html

¹⁶Tier 2 rate noted above 15 ccf but not published

¹⁷SSWD’s primary revenue/rate structure, approximately 85% of funds, come from a ¾” metered service, which is \$44.40 per month. I believe the primary revenue/rate structure for the majority of other agencies is typically 1”.

APPENDIX B:

Activity 2 Final Report



Sacramento Regional Water Utility Collaboration Study

Activity 2 Report

Benchmarking

January 2021 - FINAL

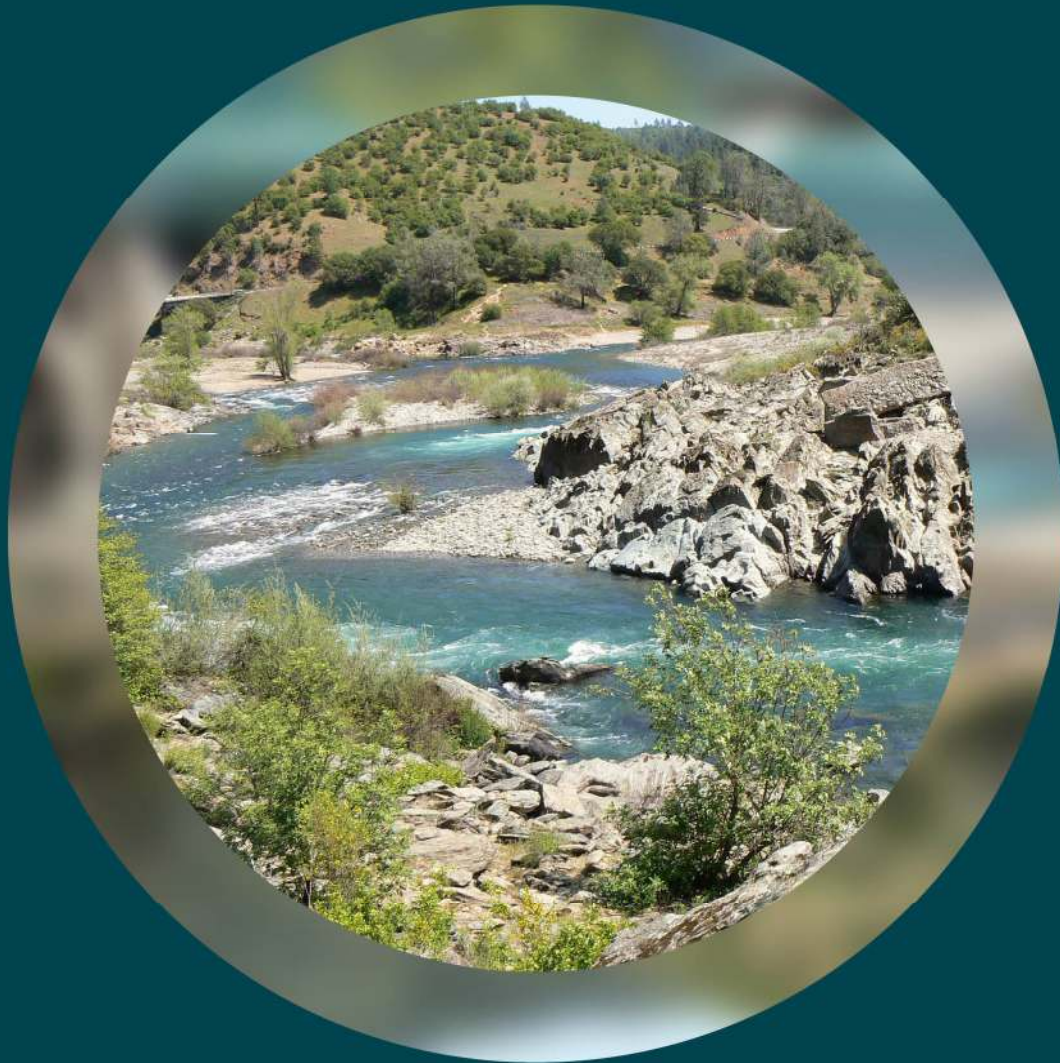


Table of Contents

Summary..... 5

Introduction 6

Prioritized Opportunities 7

Prioritization Process 7

Description of Opportunities..... 7

Distribution System Preventative Maintenance 7

Human Resources 8

Leak Detection 8

Paving..... 8

Stand-by / Emergency Operations 9

Water Conservation Programs 9

Water Supply 9

Organizational Benchmarking..... 10

Organizational and Opportunity Benchmarks 10

Overall Staffing Levels..... 11

Operations and Maintenance Cost and Capital Budget..... 14

Opportunity Benchmarking 19

Distribution System Preventative Maintenance..... 19

Human Resources..... 23

Leak Detection..... 27

Paving 30

Stand-by / Emergency Operations..... 32

Water Conservation Programs..... 34

Water Supply 36

Appendix.....38

List of Tables

Table 1: Participating Agencies Information	10
Table 2: Reported Flushing Practice	22
Table 3: AWWA Benchmark - Planned Linear Maintenance to Distribution System Length	23
Table 4: HR Services Overview	25
Table 5: Leaks and Breaks	27
Table 6: Leak Detection Program.....	28
Table 7: Annual Paving Volume and Cost.....	30
Table 8: Annual Call Out Events	32
Table 9: Participating Agencies Water Demands and Supplies	37

List of Figures

Figure 1: Customer Accounts per Employee	12
Figure 2: Population Served per Employee	12
Figure 3: MGD of Water Produced per Employee	13
Figure 4: Employee Distribution by Function	14
Figure 5: Operations and Maintenance Cost per MG Produced	15
Figure 6: Operations and Maintenance Cost per Customer Account.....	16
Figure 7: Operations and Maintenance Cost per Capita.....	16
Figure 8: Operations and Maintenance Cost per 100 Miles of Pipe	17
Figure 9: Capital Budget per Customer Account	17
Figure 10: Capital Budget per Capita	18
Figure 11: Annual Preventative Maintenance Expenditure	20
Figure 12: Annual Preventative Maintenance Expenditure per Mile of Pipe.....	20
Figure 13: System-wide Hydrant Maintenance Interval (Years).....	21
Figure 14: System-wide Valve Exercising Interval (Years)	22
Figure 15: Utility FTE Served per HR FTE	26
Figure 16: Total HR Cost per Utility FTE Served	26
Figure 17: Miles of Pipe	27
Figure 18: Leaks and Breaks per 100 Miles of Pipe	28
Figure 19: Leak Detection Costs per Mile of Pipe.....	29
Figure 20: Non-Revenue Water	30
Figure 21: Volume of Annual Paving Work Orders	31
Figure 22: Cost per Square Foot Paved.....	32

Figure 23: Call Out Events per Year and Staff Levels Required33
 Figure 24: Costs Per Call Out Event33
 Figure 25: Costs of Water Conservation Programs35
 Figure 26: Costs of Water Conservation Programming Per Capita.....35

Appendices

Appendix A 1: Number of Staff by Function.....39
 Appendix B 1: Water Conservation Communication Channels.....41
 Appendix B 2: Water Conservation Enforcement Mechanisms.....42
 Appendix B 3: Water Conservation Events.....43
 Appendix B 4: Water Conservation Incentives.....44
 Appendix B 5: Water Conservation Management Tools.....45
 Appendix B 6: Other Water Conservation Programming and Messaging.....46
 Appendix C 1: Preventative Maintenance Activities.....48

Summary

The Sacramento Regional Water Utility Collaboration Study (Study) is a collaboration among Carmichael Water District (CWD), Citrus Heights Water District (CHWD), the City of Folsom Environmental & Water Resources Department (Folsom), Del Paso Manor Water District (DPMWD), Rio Linda/Elverta Community Water District (RLECWD), Sacramento Suburban Water District (SSWD), and San Juan Water District (SJWD) (together the “participating agencies”) to identify opportunities for increased collaboration with the goal of creating additional operational and financial efficiency, and improving service provision to customers.

This document is the second of three project deliverables. It encompasses the activities for Study Activity 2 – Benchmarking. It provides an overview of organizational and opportunity specific data and benchmarks relative to each participating agency, and nationally where available. Raftelis gathered information, including virtual interviews with senior representatives of each participating agency, about the opportunities and how they hope to benefit from each. Data about the opportunities are summarized and compared in this document.

Overall, data analysis shows there is an array of approaches and different levels of services being provided by the participating agencies in the studied services. These different approaches and service levels mean resource requirements for the services vary widely among the participating agencies. This translates into a range of costs and staffing requirements normalized on a per account (customer) basis. For example, some of the agencies allocate very little time toward water conservation and human resources activities, while others have extensive water conservation programs and full-time HR resources. Some follow American Water Works Association (AWWA) best practices in terms of preventative maintenance and leak detection, while others employ their own customized approaches based on their governing board’s priorities. There is some alignment between the size of the utility and the level of services provided, but a bigger determinant appears to be what the utility prioritizes and historical practices.

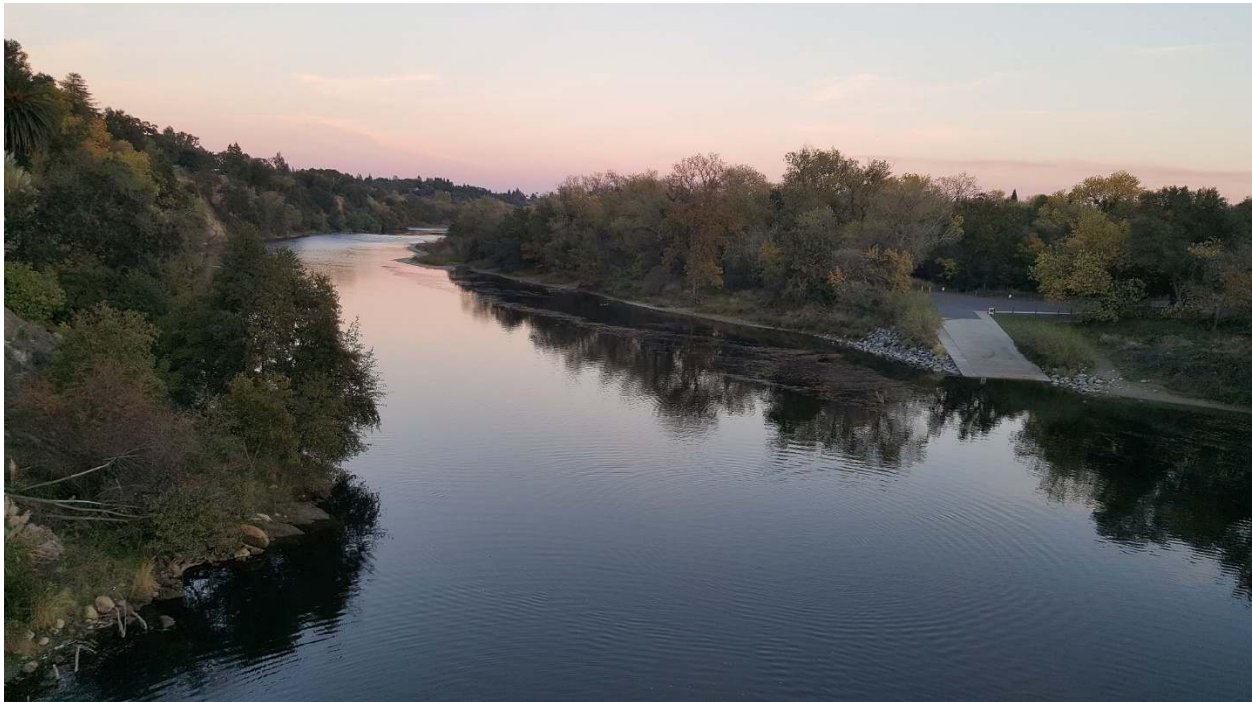
Even with the differing approaches and levels of services being provided by the participating agencies, there are commonalities. These commonalities are opportunities for collaboration. They will be explored in Study Activity 3 – Business Case Evaluations.

Introduction

The Sacramento Regional Water Utility Collaboration Study (Study) is a collaboration among CWD, CHWD, Folsom, DPMWD, RLECWD, SSWD, and SJWD (together the “participating agencies”) to identify opportunities for increased collaboration. The goals of this Study are to identify opportunities for additional efficiency and to improve service provision to customers. Increasing costs of living, evolving regulations, and additional competition for scarce water resources across California mean that agencies must work together, more seamlessly and regionally, to provide reliable and affordable services.

This document is the second of three project deliverables and encompasses the activities for Study Activity 2 – Benchmarking. It provides an overview of organizational and opportunity specific data and benchmarks relative to each participating agency, and nationally where available. Raftelis gathered information, including virtual interviews with senior representatives of each participating agency, about the opportunities and how they hope to benefit from each. Data about the opportunities are summarized and compared in this document.

Studying every aspect of each participating agency’s operation is infeasible, so Raftelis worked with the participating agencies to focus on a list of common areas that presented viable opportunities for potential collaboration. The group reviewed and narrowed a list of over 80 potential opportunities for further study. The participating agencies prioritized seven of those opportunities for investigation during a workshop on September 24, 2020. Note that while the full list of opportunities may be explored at any time by any collection of agencies, the seven priority opportunities are the focus of Study efforts for Activity 2 – Benchmarking and subsequently Activity 3 – Business Case Evaluations.



Prioritized Opportunities

Prioritization Process

After gathering the initial list of over 80 opportunities through interviews and document reviews during Activity 1, each participating agency was asked to submit their top five priority opportunities for assessment. Raftelis gathered the top five selections to identify overlaps and isolate the full unique set of opportunities. Ultimately, through combinations of directly and partially overlapping opportunity scopes, nine unique priority opportunities were isolated. These nine opportunities were discussed in a workshop with the participating agencies on September 24, 2020. The goal of the workshop was to narrow down the list of opportunities from nine to 5-7 to ensure sufficient effort could be allocated to the evaluation of each opportunity in subsequent Study phases. The result of that workshop was the identification of seven priority areas for further evaluation:

1. Distribution System Preventative Maintenance
2. Human Resources
3. Leak Detection
4. Paving
5. Stand-by / Emergency Operations
6. Water Conservation Programs
7. Water Supply

Description of Opportunities

Distribution System Preventative Maintenance

Distribution system preventative maintenance (PM) is the collection of activities employed to maintain a water system's distribution network with the goal of increasing its longevity, lowering lifecycle operating costs, and providing better service to customers. Activities such as proactive valve exercising, hydrant maintenance, and water main flushing are considered typical distribution system PM activities. Robust programs have dedicated staff employing industry best practices to achieve outcomes measured by metrics and aligned with service level targets. Representatives from some of the participating agencies would like to explore if and how joint efforts could improve PM activities.

Differing resource levels, priorities, and attitudes are the primary drivers of varying distribution system PM activity levels among the participating agencies. Practices often correlate with the number of assets and their location, age, condition, and criticality. Historical practices also strongly influence activities. PM data availability varied by participating agency with Raftelis focusing on flushing, valve exercising, and hydrant activities. Note that capital replacement and repair, as well as customer leak response and other reactive field efforts were not the focus of this review, because they are not considered PM activities.

Human Resources

Human resources (HR) functions were prioritized because many participating agencies noted gaps in their respective HR capacity to cover the full range of activities demanded. Larger agencies with dedicated staff find that their greater headcounts demand one or more dedicated HR positions. Smaller agencies do not have dedicated HR staff, thereby requiring agency general managers or other staff to include this effort in their responsibilities. Given the broad array of activities that HR covers, the participating agencies identified joint HR resources and contract resources to consider.

Leak Detection

Leak detection, whether conducted on an ad-hoc, systematic, or reactive basis in response to leaks presents an efficiency and service-level enhancing opportunity. Whether through joint contracting or sharing equipment and staff there is a sense that this area may be rife for increased collaboration. While the age, size, water pressure, and even geology of a given service area can change the perspective of a utility with respect to the need for preventative system-wide leak detection, when engaged in this more proactive manner it can lead to water loss reductions. This can be critical in periods of drought. Examples of financial incentives to explore collaboration in this area include sharing the mobilization charges that contractors often include among participants. Joint contracts could present savings on leak detection, as well as offer technology advances such as the use of Light Detection and Ranging (LiDAR), which is a remote sensing method that uses light in the form of a pulsed laser to take measurements from a plane, for which regional flyovers could be contracted. They present opportunities for reducing labor hours, mobilization, and fuel costs, while producing scale efficiencies that also reduce non-revenue water losses. Finally, it is acknowledged that there may be some overlap in ad-hoc leak detection activities with the stand-by / emergency operations opportunity area as some emergency ad-hoc leak detection activity may occur during stand-by periods, though the activities are thought to be broadly distinct enough to justify separate reviews for the purposes of this Study.

Paving

All the participating agencies outsource their paving activities that follow in-street and facility repairs, replacement, new asset construction, and other pavement disturbances. Several contractors compete for this paving work. Raftelis observed variable per area costs and contract structures across the participating agencies. Opportunities such as joint bidding may therefore be worth exploring.

If scale capacities, contracting limitations, or desires to support local firms are not prohibitive, cost savings could be obtained, particularly where larger minimum area or multiple year contract commitments are deemed acceptable. While paving requirements (thickness, material, etc.) may vary by participating agency, and overlaying City / County jurisdictions, there is a feeling that this would not be prohibitive to contractors since most roads share similar paving requirements. Some participants have cited the success of chemical consortia programs in achieving savings, despite varied requirements, as a template or reason for optimism in exploration of a successful paving collaboration.

Stand-by / Emergency Operations

Stand-by / emergency operations occur after normal business hours to address a concern or a system issue such as a leak or service failure. Discussions pertaining to the stand-by / emergency operations opportunities focused on after-hours on-call staffing costs and resource availability. Future collaboration in this area would be understood to go above and beyond any aspect of existing Mutual Aid Agreements for support during significant emergencies, and would therefore require either modifications to those agreements or wholly separate agreements. Most participating agencies provide rotating staff with stipends or additional pay for weekly on-call duty with overtime pay for callouts. Other costs include dedicated vehicles, as well as answering service and other supporting technology costs (e.g. dedicated iPads, SCADA alarm systems).

Some larger agencies in the region may have sufficiently infrequent rotation intervals that there is the possibility that staff would have an appetite for more overtime opportunities in support of select tasks for smaller agencies where staff may be overburdened.

Water Conservation Programs

Water conservation programs promote the efficient use of water resources by customers through education and awareness. The water conservation programs opportunity was framed as an area where collaboration could occur to augment existing efforts by each participating agency to provide customer service programming and materials coordination. The goal is to foster joint efforts to enhance the communications channels that agencies utilize to increase awareness and participation in conservation activities.

The Regional Water Association (RWA) offers programming to support regional collaborative success in the area, yet the participating agencies identified an appetite for more offerings during the opportunity prioritization process. This suggests that RWA and other activities could be expanded. Another element within this area of opportunity is a concept of involving Non-Government Organizations (NGOs) such as community non-profit groups to provide installation or cost assistance to low income households to improve their indoor or outdoor water efficiency.

Water Supply

Regional groundwater and surface water sources extend across and outside the service area boundaries of the participating agencies. The agencies are also impacted collectively by changes in legislation and policy that apply broadly to regional or state-wide water management. The Water Supply opportunity considers areas to collaborate on preservation, distribution, and use of water assets.

During the prioritization process, opportunities for collaborative successes around water supply touched upon reliability enhancement and optimization of water banking, transfers, and/or wheeling potential. This opportunity presents a chance to improve water security in the region, particularly during periods of drought, and to increase monetization of assets.

Organizational Benchmarking

Organizational and Opportunity Benchmarks

The sections that follow detail high-level organizational metrics and associated national benchmarks (where available), as well as comparative metrics among the participating agencies that focus on the seven priority opportunities. Following Activity 2 – Benchmarking, Activity 3 – Business Case Evaluations will advance these data analytics and interpret them within the context of potential collaborative models to better understand the savings and service level enhancements that working together may offer.

This section provides a comparison of organizational benchmarking data collected for each of the participating agencies and national metrics contained in the publication *AWWA Utility Benchmarking (2019): Performance Management for Water and Wastewater*.¹ High-level organizational information about the participating agencies is shown in Table 1.

Table 1: Participating Agencies Information

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Type of Agency	Irrigation District	Irrigation District	Municipal Department	County Water District	County Water District	County Water District	Community Services District
Total Customer Accounts (Retail and Wholesale)	11,522	19,944	21,654	1,797	4,628	46,268	10,704
Wholesale Accounts	1 ²	0	0	0	0	0	4
Total Employees (FTEs)	32	36	34	4	10	70	48
MGD Produced (Avg per Day)	12.31	14.57	17.1	1.08	1.9	27.3	40
Miles of Pipe	160	249.6	367	21	62.66	698	222

¹ This is a high-level comparison to national benchmarks and the middle 50% of the national range. Raftelis recognizes that many factors impact spending levels for a given utility.

² Golden State Water Company / Aerojet Rocketdyne Agreement

Operations and Maintenance Budget	\$7,101,576	\$13,071,059	\$14,234,824	\$1,106,450	\$1,803,560	\$23,241,000	\$20,020,600
Capital Budget	\$4,942,816	\$4,378,110	\$3,881,601	\$473,483	\$2,887,500	\$19,565,000	\$10,900,200

Overall Staffing Levels

The participating agencies have between 4 and 70 employees, serve between 1,797 and 46,268 customer accounts (including wholesale), and produce between 1.08 and 40 million gallons per day (MGD) of water. With such a range in scale, comparing the number of accounts served per employee and the MGD produced per employee provides a reasonable comparison of the agencies through normalization of the data to like units.

The number of customer accounts per employee are compared between the participating agencies in Figure 1. Also included in this comparison are the AWWA utility benchmarking median, 25th percentile, and 75th percentile. As seen in the figure, Folsom and SSWD serve the most retail customer accounts per employee and are both above the 75th AWWA percentile. Being above the 75th percentile means that the utility serves more accounts per FTE than 75% of the utilities in the AWWA survey. The operations of SJWD including wholesale and CWD serve fewer customers per FTE than the AWWA Median. While the ratio of customer accounts per employee when including retail and wholesale operations is lower for SJWD, staffing is reflective of the need to meet wholesale customers requirements. Wholesale entities are counted as just four customer accounts but serve a population that is larger than the SJWD retail service area. By reviewing the population served per employee (including wholesale population served) as shown in Figure 2, it becomes clear that SJWD is serving a larger population per FTE than suggested in the customer accounts per employee figure, because of the wholesale customers. Note that customer accounts per employee can be an indicator of efficiency, but it is heavily influenced by the scale of the operation, and more importantly, the service levels provided. Higher service levels often require more staff.

The MGD of water produced per employee is compared between the participating agencies in Figure 3. The AWWA benchmarking data is shown on the figure as well. Most of the participating agencies produce more water per employee than the AWWA 75th percentile of 0.27 MGD per employee. RLECWD produces 0.19 MGD per employee, which is slightly less than the national median of 0.20 MGD per employee. SJWD produces 0.83 MGD per employee which is significantly higher than the other participating agencies and the national data. The four wholesale customers SJWD serves are likely impacting this statistic. Note that the demographics of the customer base significantly impact these metrics. Systems with large and/or high numbers of large commercial, wholesale or industrial customers will have a much higher ratio.

Figure 1: Customer Accounts per Employee

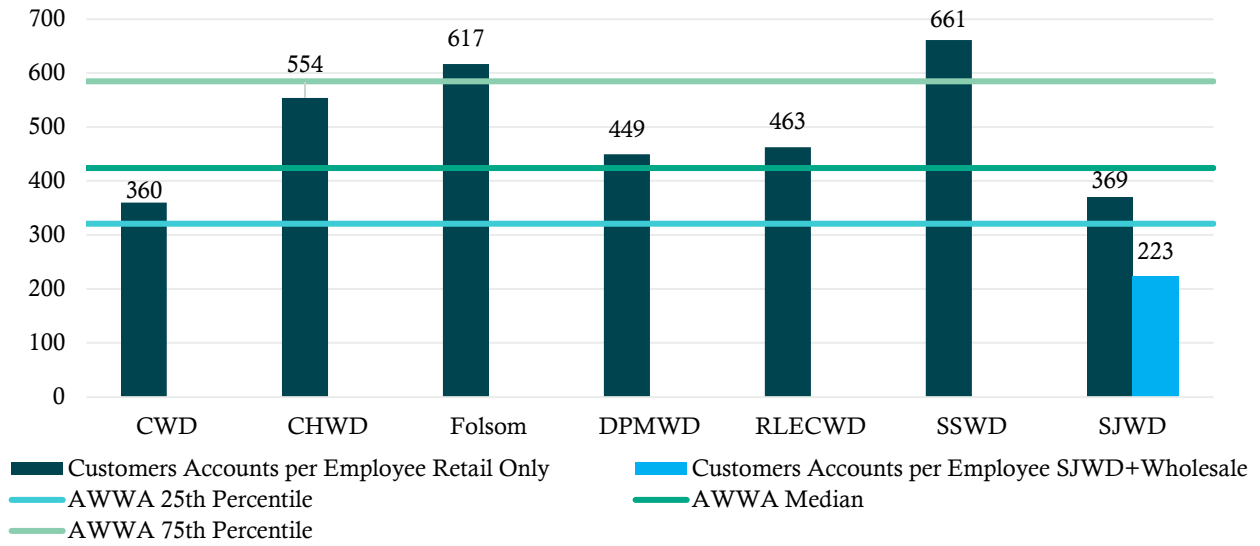


Figure 2: Population Served per Employee

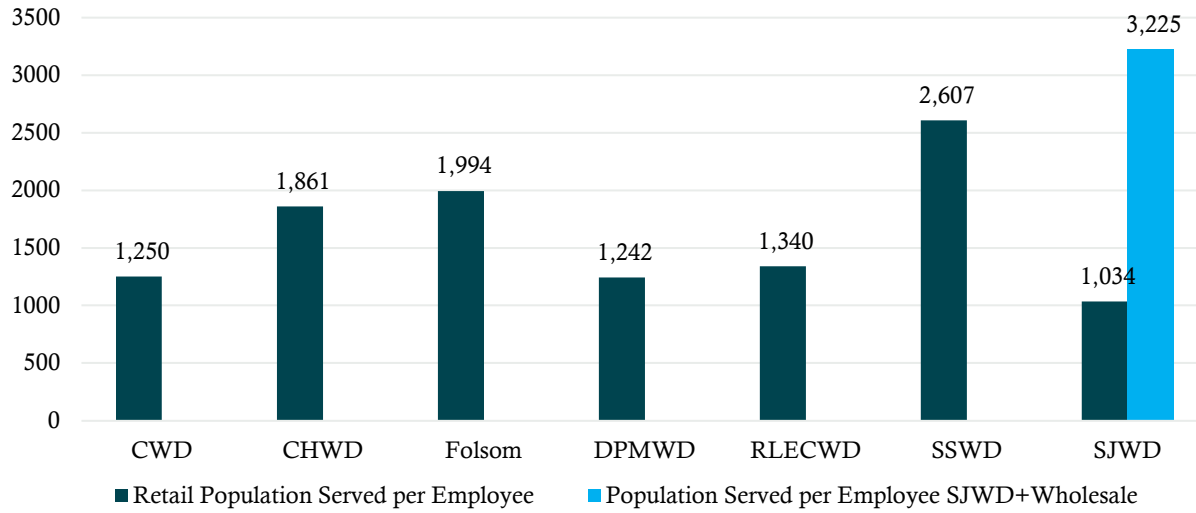
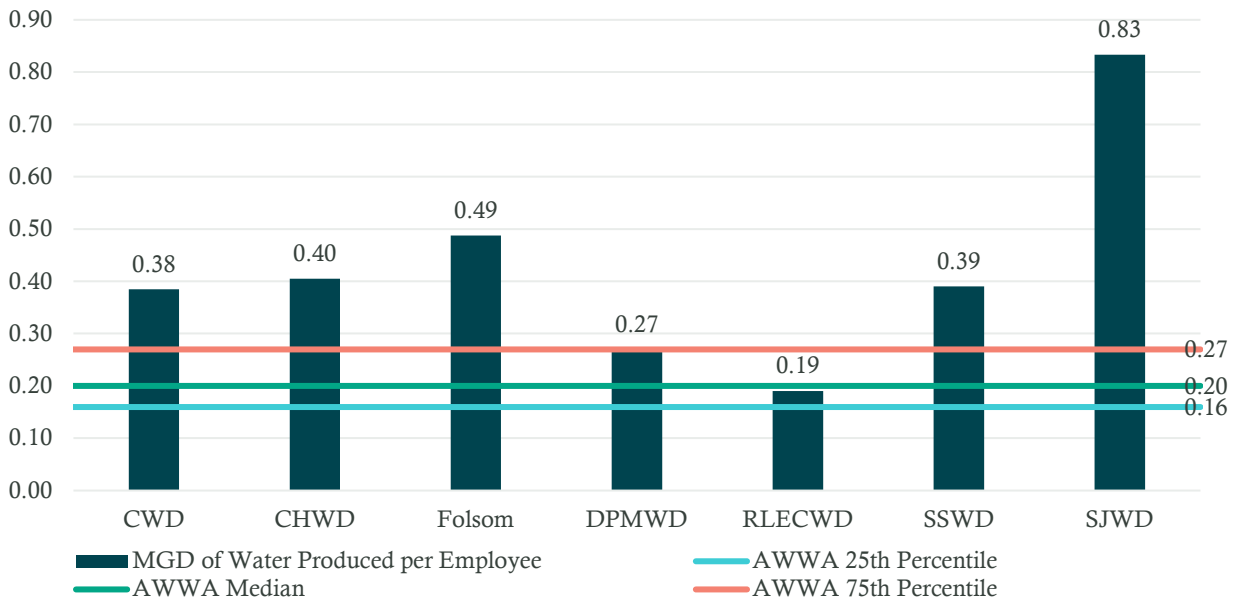


Figure 3: MGD of Water Produced per Employee

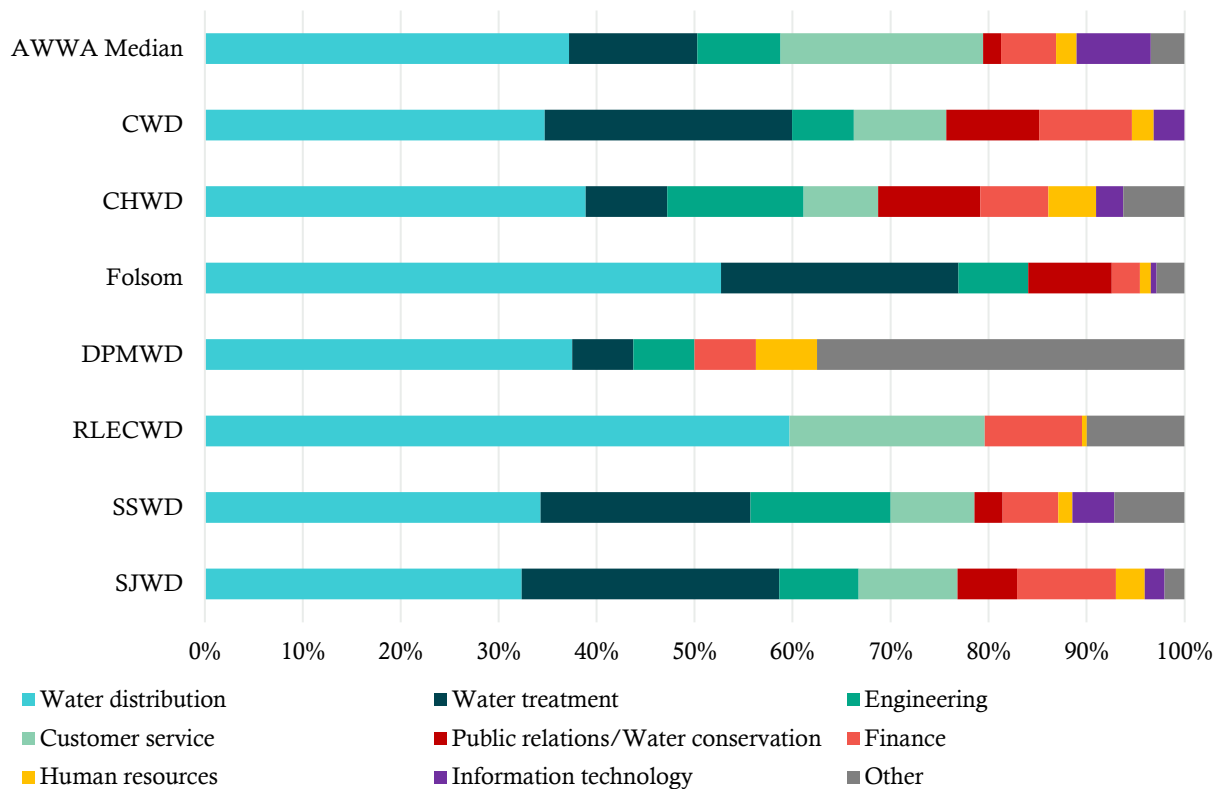


The number of budgeted staff within each of the participating agencies is aggregated in Appendix A, showing the breakdown by functional area. The areas shown are:

- Water distribution
- Water treatment
- Engineering
- Customer service
- Public relations/Water conservation
- Finance
- Human resources (HR)
- Information technology (IT)
- Other

To normalize the comparison of staffing levels, an employee by function ratio was calculated as a percentage of the overall number of employees budgeted to the utility. Additionally, some administrative and management functions have been rolled into the “Other” category. These comparisons are shown in Figure 4. The AWWA 2019 median for these functional areas is included in the figure.

Figure 4: Employee Distribution by Function



Operations and Maintenance Costs and Capital Budget

The operations and maintenance (O&M) costs for water service can be compared between utilities once normalized. For the participating agencies, these costs have been normalized by water production (Figure 5), by the number of accounts served (Figure 6), per capita of population (Figure 7), and by the miles of distribution pipeline (water mains excluding customer service lines) (Figure 8).

Reviewing these three metrics provides a fuller comparison between the agencies, especially because both CWD and SJWD provide water to wholesale customers as well as retail customers. There is national benchmarking data from AWWA for these three metrics, which are included on the figures. The final operational comparison between these agencies is the capital budget spent per customer account (Figure 9). This provides a comparison of capital improvement spending.

Shown in Figure 5, the O&M cost normalized by water production gives a unit cost (\$/MG) for each of the agencies. The AWWA national median is \$2,537 per MG and the 75th percentile is \$1,803 per MG. Most of the participating agencies are near the median or between the 75th percentile and the median. Both CWD and SJWD (including wholesale) have unit costs of production less than the 75th percentile. SJWD’s retail O&M cost per MG produced is higher and falls near the AWWA 25th percentile.

Figure 6 presents the O&M cost normalized by the number of accounts served. It shows that most of the participating agencies spend near or above the national 25th percentile of \$526 per account. RLECWD spends near the national median of \$383 per account. SJWD, which provides service to its retail area and four wholesale customers, spends close to \$1,870 per customer account overall, but a still higher than others \$1,102 per account for their retail operations alone. Figure 7 reveals that on a per capita basis (including wholesale populations served), SJWD has among the lowest O&M costs, but the highest for their retail only operations. Again, level of service differences play a big factor in the cost per customer account. In addition, surface water tends to be more expensive to treat than ground water.

The O&M costs normalized by the miles of distribution pipeline are shown in Figure 8. It is calculated per 100 miles of pipe. The national median is \$2,988,629 per 100 miles of pipe. Many of the participating agencies have O&M costs per 100 miles of pipe close to the median. CHWD, DPMWD, and SJWD’s retail operations are spending close to the national 25th percentile of \$4,897,484 and SJWD with wholesale spends \$9,018,288 per 100 miles of pipe.

Figure 9 shows the capital budget per customer account for the participating agencies. There is not a national benchmark for this metric. CHWD, Folsom, and DPMWD are on the lower end of the agencies for capital spending per customer account—the average for these three agencies is \$221 per account. RLECWD has the highest capital spending per account and per capita as shown in Figure 10.

Figure 5: Operations and Maintenance Cost per MG Produced

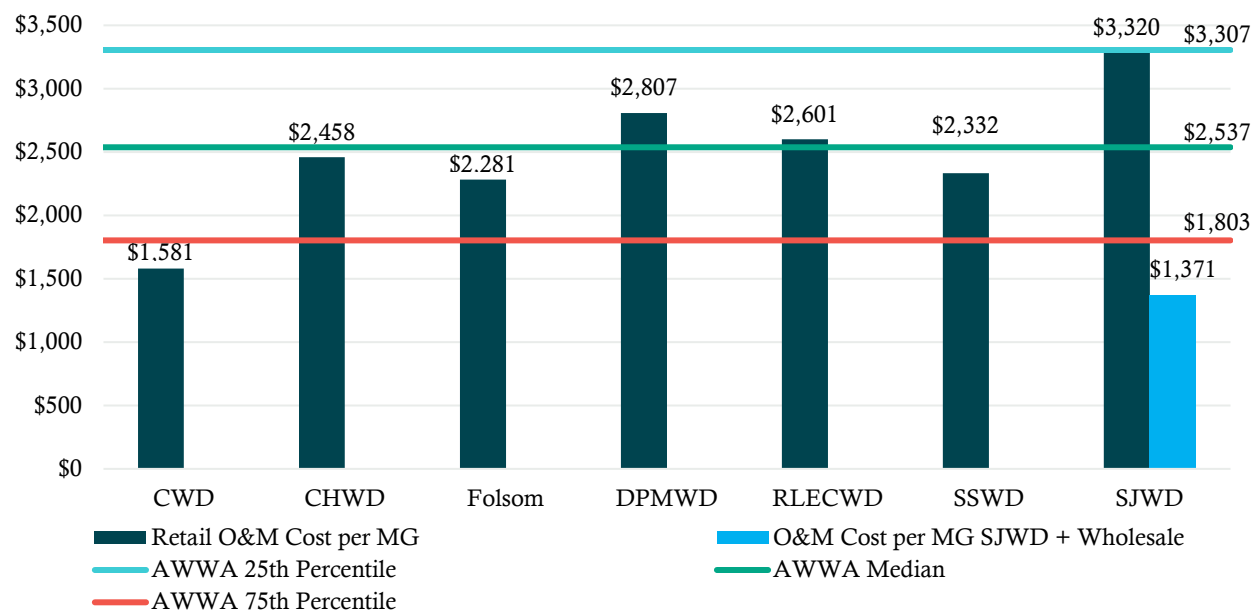


Figure 6: Operations and Maintenance Cost per Customer Account

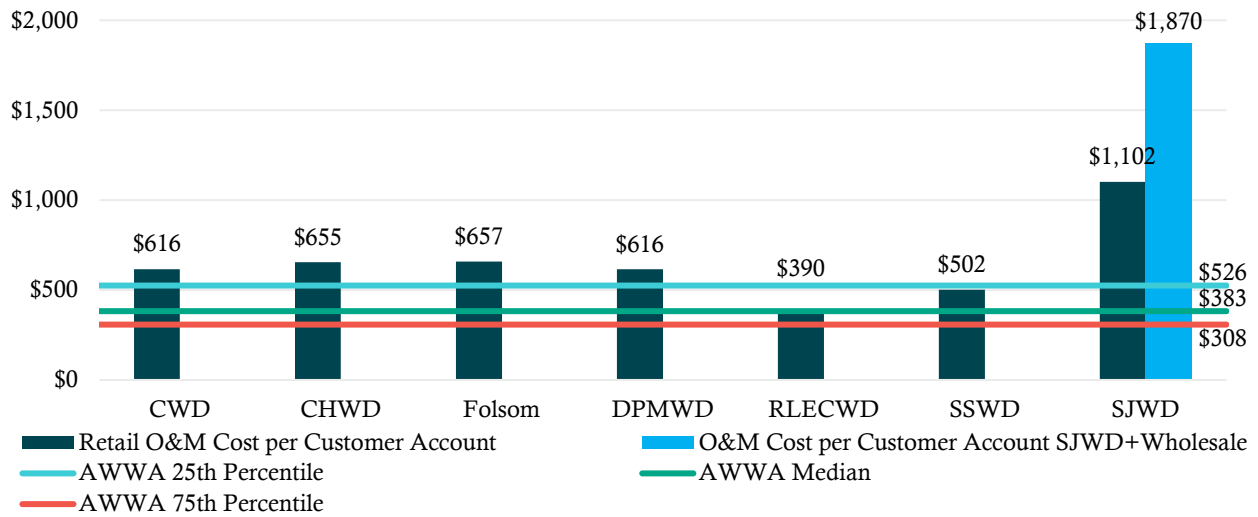


Figure 7: Operations and Maintenance Cost per Capita

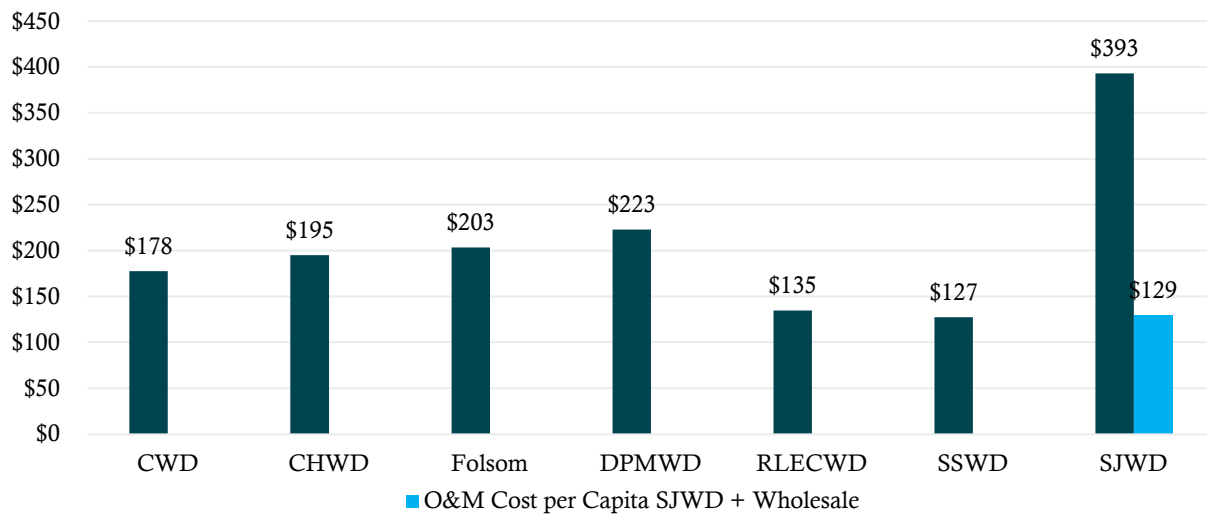


Figure 8: Operations and Maintenance Cost per 100 Miles of Pipe

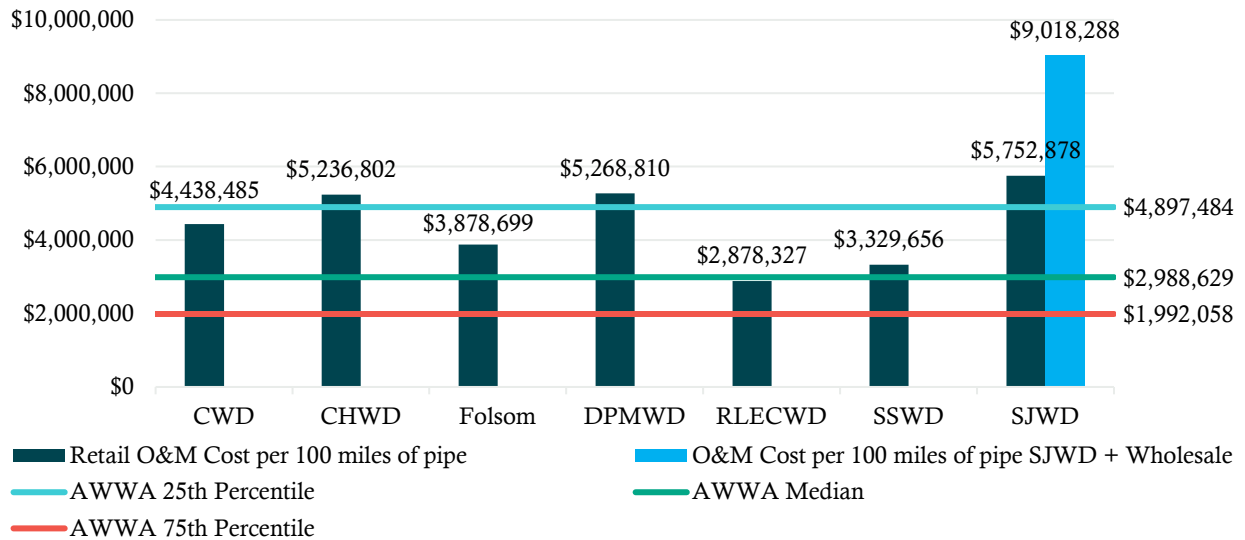


Figure 9: Capital Budget per Customer Account

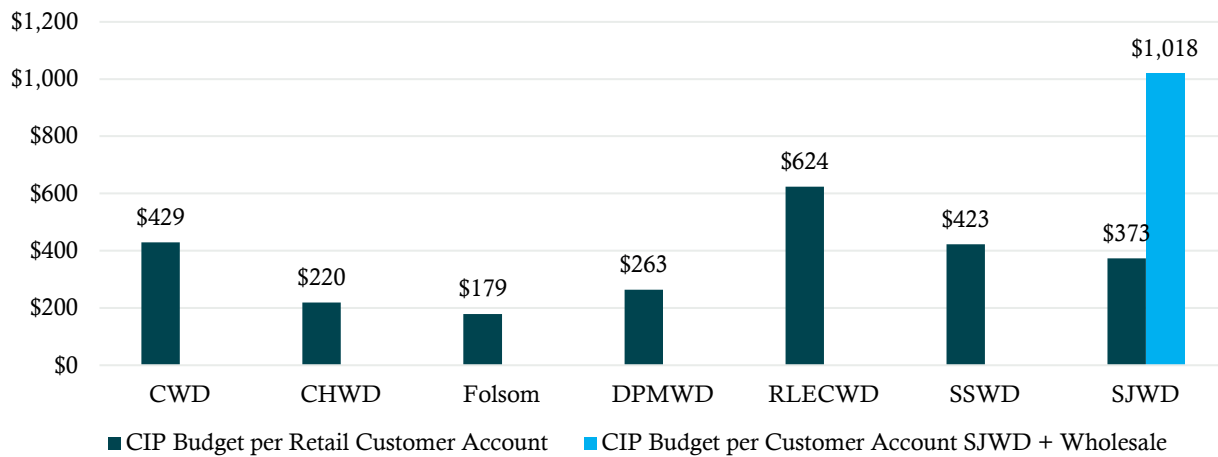
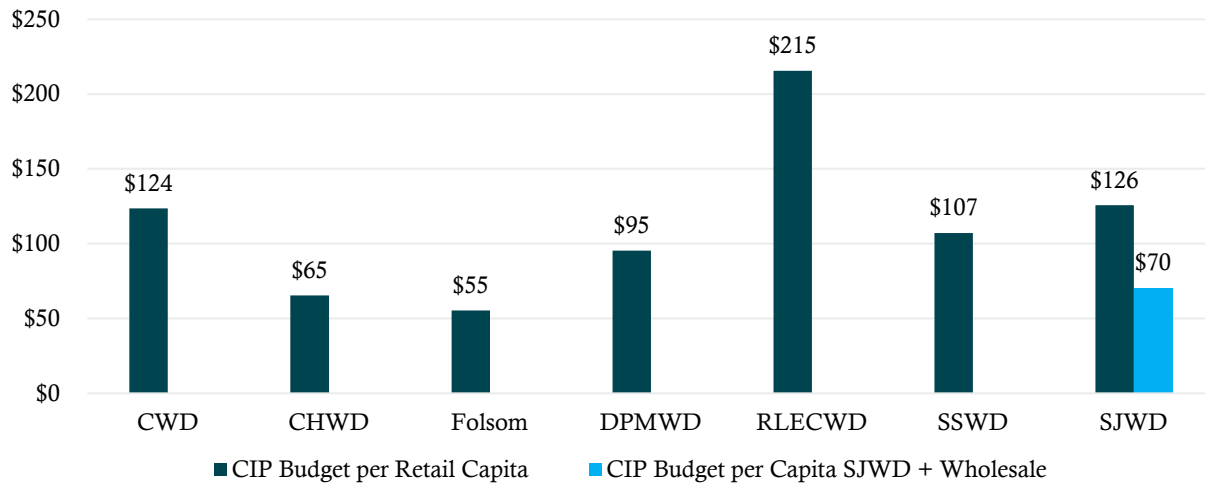


Figure 10: Capital Budget per Capita



Each of the participating utilities have O&M and capital costs within a regional range, and certainly in alignment with national peers. Because these graphs don't convey the differences between the costs and complexity of surface water treatment and groundwater treatment or show the different service levels provided, and don't accurately depict wholesale customer service, they must be interpreted carefully. Few conclusions can be drawn from these graphics and underlying data alone.

Opportunity Benchmarking

Opportunity benchmarking data and analysis is presented in this section. The sections covering each opportunity are arranged in alphabetical order as there is no preference given to the opportunity priorities at this stage. Subsequent analysis in Activity 3 may reveal either greater financial savings opportunities, likelihoods of success, or appetites for some opportunities over others.

Distribution System Preventative Maintenance

PM ensures the reliability of a water distribution and transmission system and that levels of services are provided to customers at the least possible long-term cost. PM is often neglected because of competing priorities and because its benefits are often less apparent in the short term. You might say this is where the “rubber *does not* hit the road” for the “out of sight, out of mind” conundrum that is buried infrastructure. The participating agencies have identified the possibility of collaborative action as a way to overcome the varied stresses placed on achieving desired PM service levels. PM activities considered in this assessment are detailed in Appendix C. Note that few agencies provided data on large meter testing, but costs for that work are intended to be captured in this section. However, meter repair and replacement work is considered reactive rather than preventative and excluded from the assessment.

Figure 11 charts PM expenditures by year, while Figure 12 charts the same on a per mile of pipe basis for the participating agencies. In the per mile of pipe chart, CWD costs appear to represent outliers suggesting that further cost allocation may be necessary. Otherwise, PM expenditure per mile of pipe falls into a range from \$376 (RLECWD) to \$2,217 (CHWD). These costs reflect a combination of different PM activity levels, pay and benefits, infrastructure age and quantity. They represent very different PM approaches among the participating utilities. Note that AWWA has manuals of practice with guidance on maintaining all major distribution asset types. Each recommends regular PM activities at various intervals.

Figure 11: Annual Preventative Maintenance Expenditure

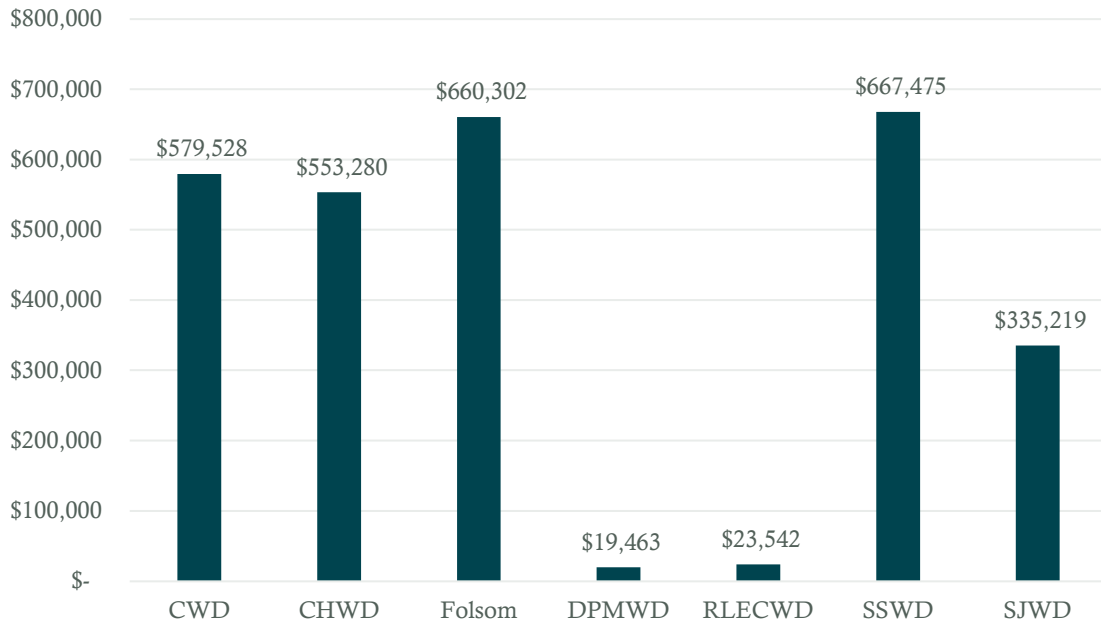


Figure 12: Annual Preventative Maintenance Expenditure per Mile of Pipe

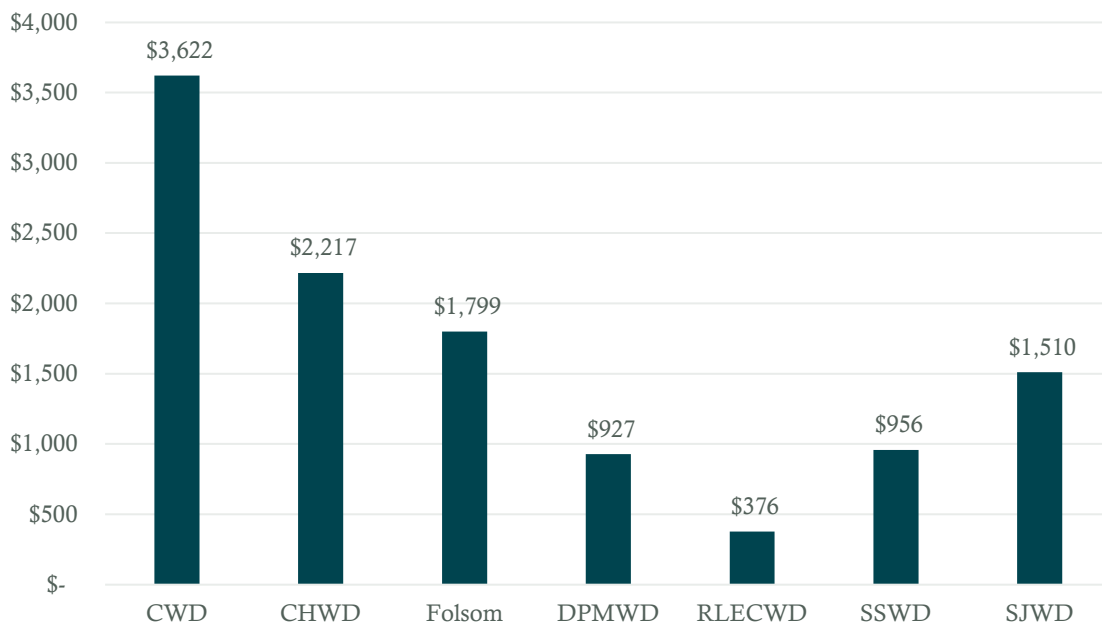


Figure 13 details available data on the frequency of hydrant maintenance. Reported hydrant maintenance activities vary by utility and may include painting, flushing, inspecting, exercising, and servicing of the hydrant. The frequency of engaging with a given hydrant ranges from every year (DPMWD noted annual flushing of their 200 hydrants) to about every 7 years (CHWD noted general maintenance for 300 of 2,156 per annum).

Figure 14 details available data on the frequency of valve exercising. Some utilities noted that their activities in this area cover mainline, blow-off, hydrant, and/or ARV/CARV valves with the largest assets having greater PM frequency than the system-wide intervals. The frequency of valve exercising ranges from unspecified and infrequent due to access issues (DPMWD) to about every 12 years (CHWD noted about 500 of 5,964 are exercised per year). Many entities do not have PM valve exercising and maintenance programs, instead relying on reactive pipeline renewal activities and main breaks for opportunities to exercise valves.

Table 2 describes reported flushing practices, which vary based on groundwater usage and resulting water quality, pipe age, the number of dead-ends, drought conditions or other factors. Reported practices range from as needed flushing and unspecified approaches to annual dead-end or hydrant flushing. None of the agencies reported annual unidirectional flushing. CWD reported that they are in the process of developing a system-wide plan, which may present an opportunity to share notes with others in the region given the wide variation in practices. AWWA recommends utilities employ a regular unidirectional flushing program.

Figure 13: System-wide Hydrant Maintenance Interval (Years)

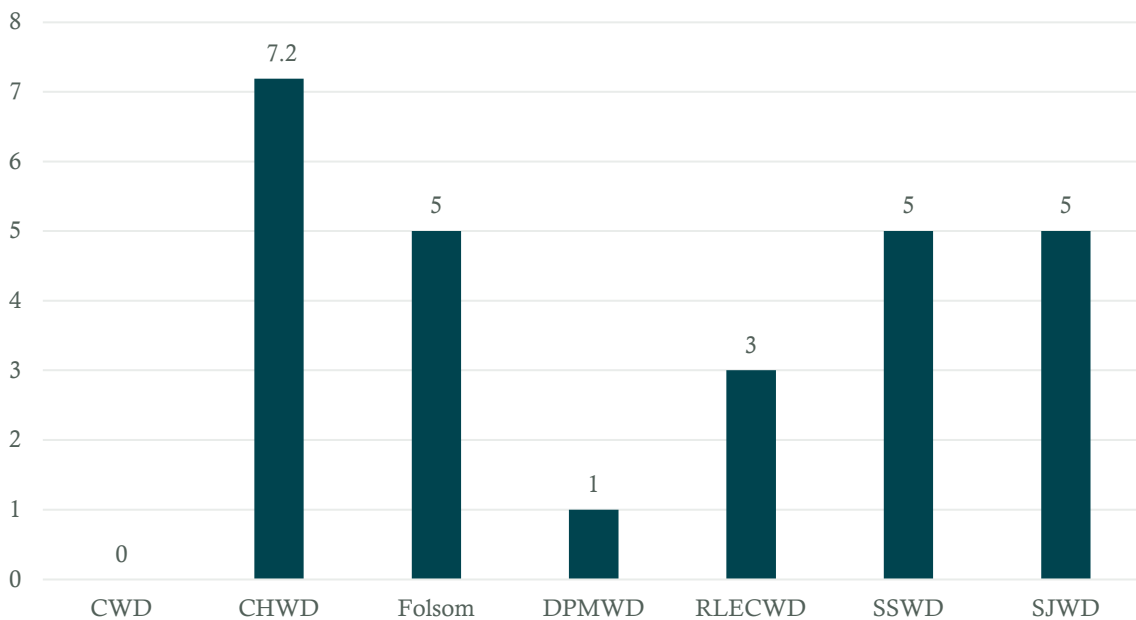


Figure 14: System-wide Valve Exercising Interval (Years)

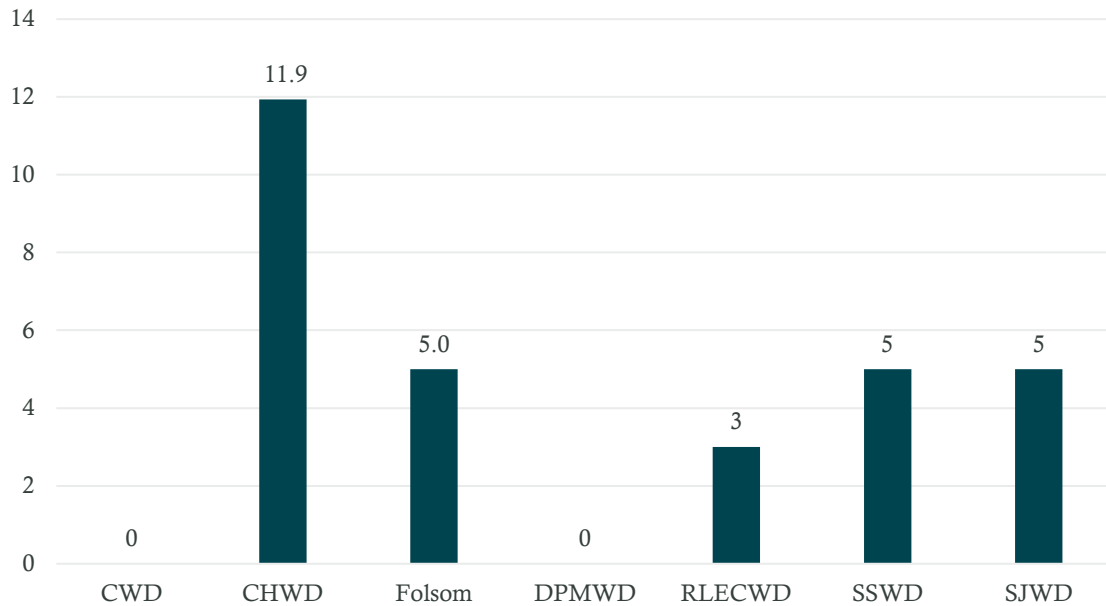


Table 2: Reported Flushing Practice

Participating Agency	Reported Flushing Practice
CWD	As needed currently but system-wide plan in development
CHWD	As needed
Folsom	Dead-ends every year and system-wide every 5 years
DPMWD	Annual hydrant flushing
RLECWD	System-wide every 3 years
SSWD	When necessary, no formal program
SJWD	Dead-ends every year

While the current metric comparisons included in this section do not have national benchmarking equivalents, there is national benchmark data for planned linear maintenance to distribution system length (hours per 100 miles of pipe), which is shown in Table 3. For Task 3, the participating agencies should consider whether the comparison of this metric on a national level would provide further context for the agencies for the identification of collaborative opportunities.

Table 3: AWWA Benchmark - Planned Linear Maintenance to Distribution System Length

AWWA Benchmark	75 th Percentile	Median	25 th Percentile
Planned Linear Maintenance Hours per 100 Miles of Distribution Pipe (hr./100 miles of pipe)	1,793	937	642

There are many collaborative opportunities for PM ranging from equipment and staff sharing to communicating lessons learned. For example, DPMWD may gain insights from SSWD's efforts to relocate assets from backyards to streets to improve access. Some participating agencies have recently begun to engage in contracting to meet PM objectives, while others might not yet have seriously considered such an approach. There are opportunities to do more through a collaborative scale contract with attractive rates per mile of pipe compared to what might be offered otherwise.

Appendix C details the reported PM activity areas reported by each agency. The participants should review the tables in Appendix C and consider both where their PM activities could be enhanced relative to peers and how collaborative action might get them closer to a more comprehensive program with less cost.

Human Resources

The participating agencies vary in how Human Resources (HR) services are provided. Each agency identified some areas of gaps and opportunities for shared or expanded HR services. All agencies have some internal capabilities, and a few agencies hire external contractors to fill in the gaps in services provided. This information is shared at a high level in Table 4.

SSWD contracts HR service support as needed to supplement the work of the one HR FTE who supports 70 FTEs in the agency. The supplemental work includes some of the following services:

- Bryce Consulting:
 - Classification analysis and job description development/revision
 - Recruitment support (review of job applications, development of oral interview questions, facilitation of oral interview, reference checks)
 - General HR support (development/revision of personnel policies, audit of personnel practices, advising managers on performance management issues)
- Employee Benefits Insurance Brokerage and Consulting Firm (EPIC)
 - Complete benefit renewal analysis for all district benefits and assist with contract negotiations and renewals.
- Management Partners
 - Developed a training and leadership development plan for the district.

SJWD contracts legal labor assistance with Meyers Fozi, LLP and HR service support with Bryce Consulting. The support provided by Bryce Consulting includes:

- Development of job announcements
- Placement of ads
- Receipt and screening of applicants
- Development of selection materials

- Scheduling and facilitating interviews
- Maintaining contact with candidates
- Making offer to selected candidate
- Conducting reference checks

CHWD also contracts with Bryce Consulting for unspecified services.

To normalize the number of HR related FTEs at each of the agencies, the number of utility FTE served by one HR FTE was calculated and shown in Figure 15. RLECWD stands out among the participating agencies in that the General Manager provides HR services as a portion of their duties. So, while the agency has 10 FTEs, the time spent on HR is representative of one full-time HR employee supporting 200 full-time employees. It is important to also note that Folsom is supported by the shared HR department with the City; this agency would be unable to support the other agencies on HR collaboration.

Another comparison made is the total HR cost per utility employee. Figure 16 shows this comparison which highlights that cost goes down when the scale of the utility increases.

Table 4: HR Services Overview

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Total Employees	32	36	35	4	10	70	48
HR FTE	0.7	1.75	0.4	0.25	0.05	1	1.45
Total HR Cost	\$70,000	-	\$53,865	\$23,228	\$7,540	\$8,650	\$8,785
HR Services Offered	Comprehensive less gaps	Comprehensive	Recruitment, City policy and procedures, worker's compensation, short-term and long-term disability, maintain personnel files	Comprehensive less gaps	Comprehensive less gaps	Comprehensive less gaps Good training facility; ACWA-JPIA is an online resource	Comprehensive less gaps
HR Service Gaps or Opportunities	Staff morale building, training coordination	Training coordination	None	None	GM provides the HR services currently (lack of capability for separation of powers)	Training and recruitment, updating policies and procedures handbooks, restart regional JPIA group	Recruitment and selection, non-technical staff development, training and team building, performance management and employee coaching/discipline, culture building, keeping abreast of labor laws.
Contract Services	None	Bryce Consulting	None	None	None	Bryce Consulting, Employee Benefits Insurance Brokerage and Consulting Firm (EPIC), Management Partners	Bryce Consulting, Meyers Fozi, LLP

Figure 15: Utility FTE Served per HR FTE

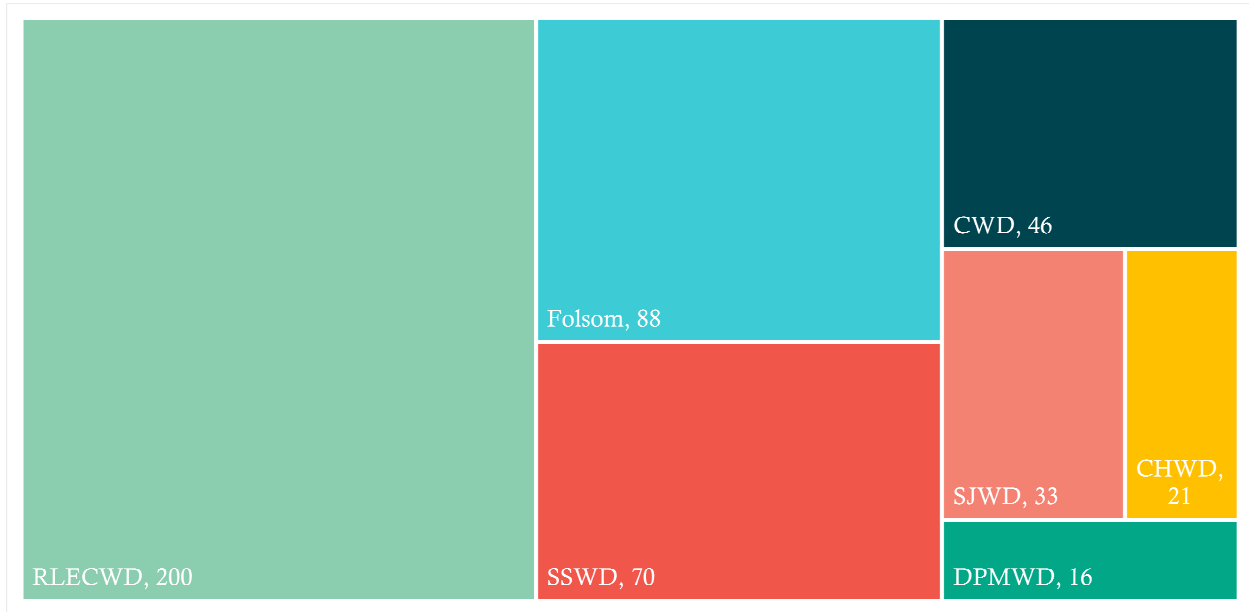
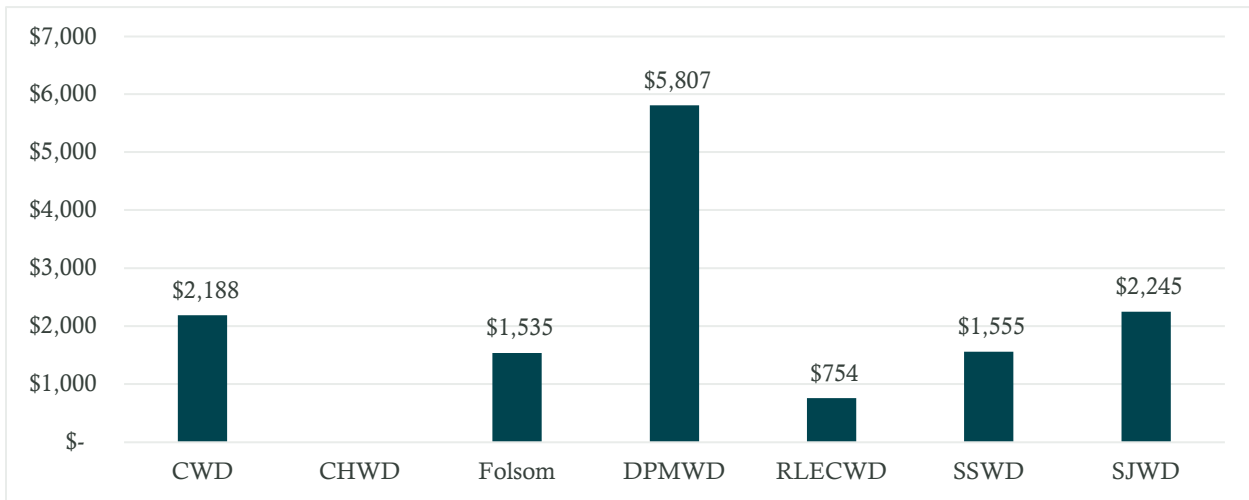


Figure 16: Total HR Cost per Utility FTE Served³



³ CHWD was not able to share this information.

Leak Detection

The participating agencies maintain a total of 1,780 miles of water distribution and transmission pipelines. Table 5 lists the total miles of pipe, leaks and breaks relating to service lines and mains, and the total acceptable number of main breaks per 100 miles if the agency has set an acceptable range. For further comparison, AWWA utility benchmarking provides a median of 9.2 for leaks and breaks per 100 miles of mains per year (services not included in AWWA benchmark).

Table 5: Leaks and Breaks

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD	AWWA Median
Miles of pipe	160	249.6	367	21	62.66	698	222	-
Leaks and breaks per 100 miles of pipe (service lines)	59.1	35.3	31.4	53.5	121.9	10.9	36.8	-
Leaks and breaks per 100 miles of pipe (mains)	27.9	4.5	0.4	11.1	4.8	7.4	1.9	9.2
Acceptable number of main breaks per 100 miles	0	N/A	0.3	95.2	N/A	N/A	40.5	-

Figure 17 shows the miles of pipe ordered by total miles by agency. In Figure 18, keeping with the same order, the total leaks and breaks per 100 miles of pipe per year are shown for each agency. This is split between the leaks and breaks per 100 miles of main per year and per 100 miles of service lines per year.

Figure 17: Miles of Pipe

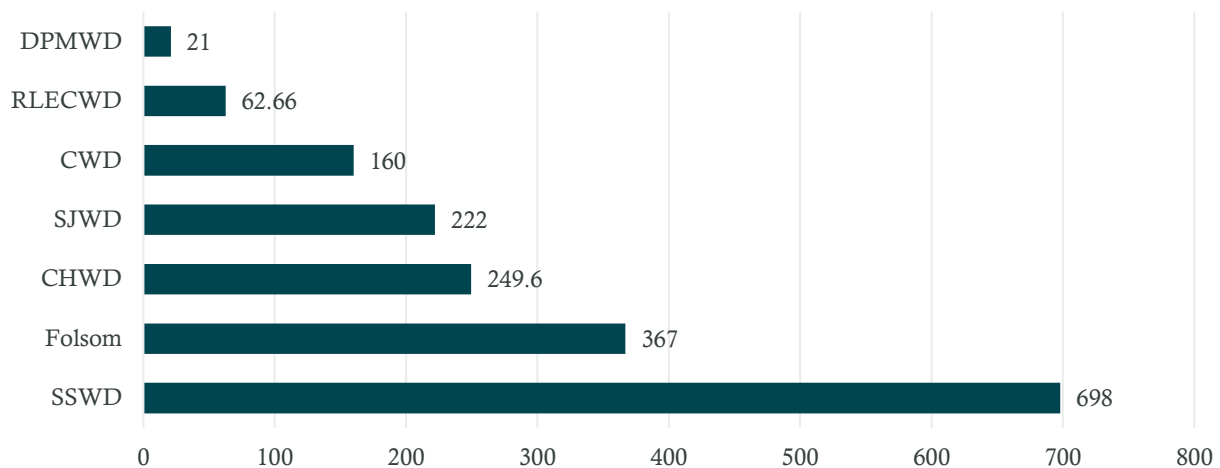
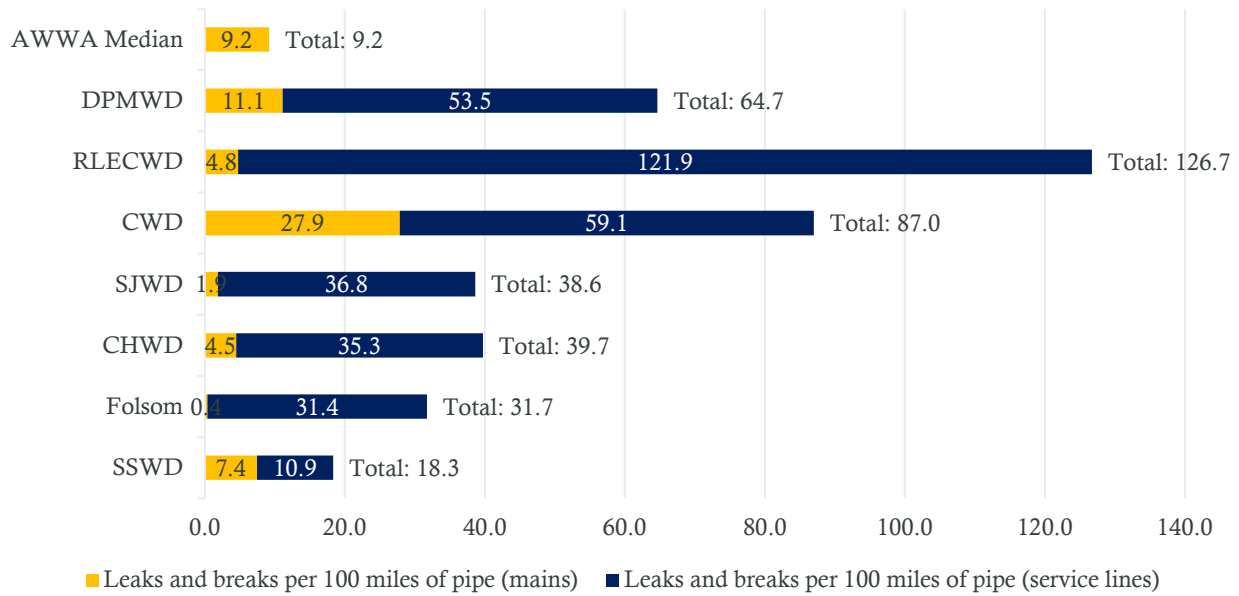


Figure 18: Leaks and Breaks per 100 Miles of Pipe



CHWD, DPMWD, and RLECWD all do not have system-wide leak detection programs, and DPMWD does not perform any systematic leak detection on their 21-mile system because the pipes are in backyards. For the other agencies, the frequency of the single system-wide leak detection cycle ranges from 4 to 6.4, shown in Table 6. The leak detection costs per miles of pipe are shown in Figure 19. CHWD, which does not have a system-wide leak detection program, has an expected lower cost per mile compared to the other agencies as they are only spending time on this task on an ad-hoc basis.

Table 6: Leak Detection Program

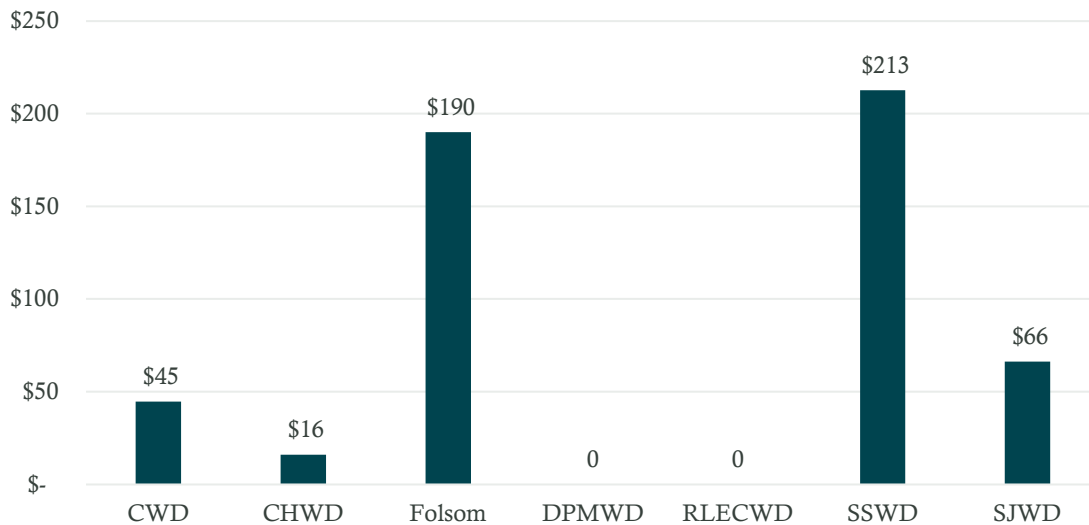
	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Miles of pipe	160	249.6	367	21	62.66	698	222
Frequency of a single system-wide leak detection cycle	6.4 ⁴	N/A	4 ⁵	N/A	N/A	5	5
Leak detection costs per mile of pipe	\$45	\$16	\$190 ⁶	N/A		\$213	\$66

⁴ Goal is 3

⁵ Goal is 3; reality has been 3-5 based on most recent 3 rounds

⁶ Includes leak detection for 21,654 service lines as well

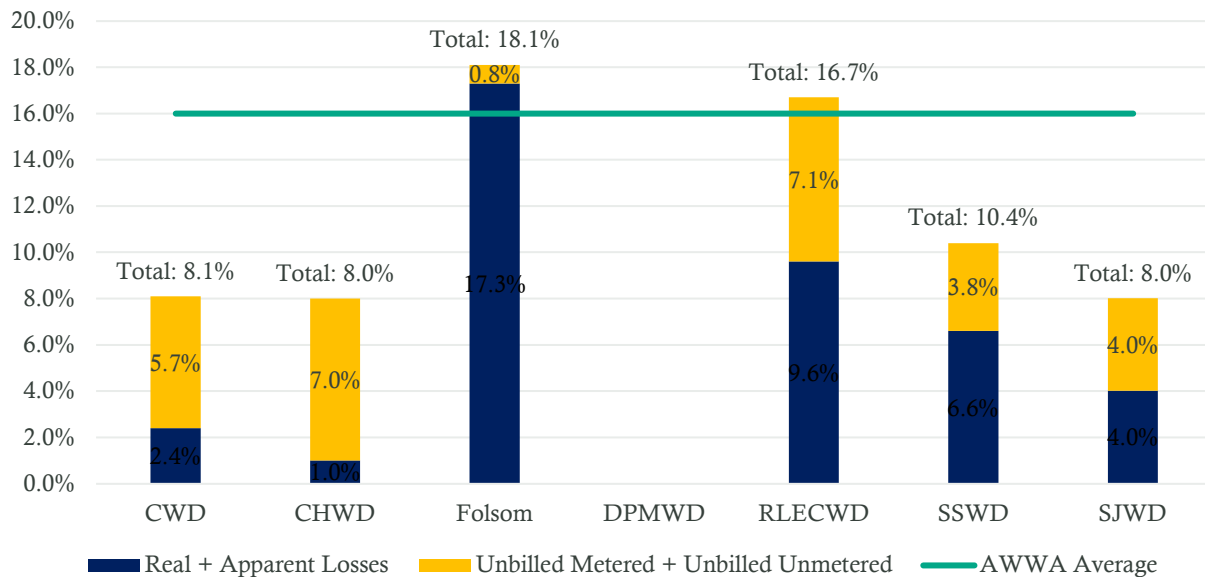
Figure 19: Leak Detection Costs per Mile of Pipe



Utilities incur Real Water Losses from pipeline leakage and Apparent Water Losses when customer water consumption is not properly measured or billed.⁷ This is considered a portion of the non-revenue water at the utility. Also subsumed in non-revenue water is unbilled metered usage and unbilled unmetered usage. Except for DPMWD, which solely provides unmetered service to residential accounts, the participating agencies provided data about non-revenue water. This includes the breakdown of real and apparent water losses and unbilled metered and unbilled unmetered water. The percentage of the total water produced is shown in Figure 20 for the agencies.

⁷ Real Water Losses and Apparent Water Losses are formally defined by AWWA in its manual M36 Water Audits and Loss Control Programs, Fourth Edition.

Figure 20: Non-Revenue Water



Paving

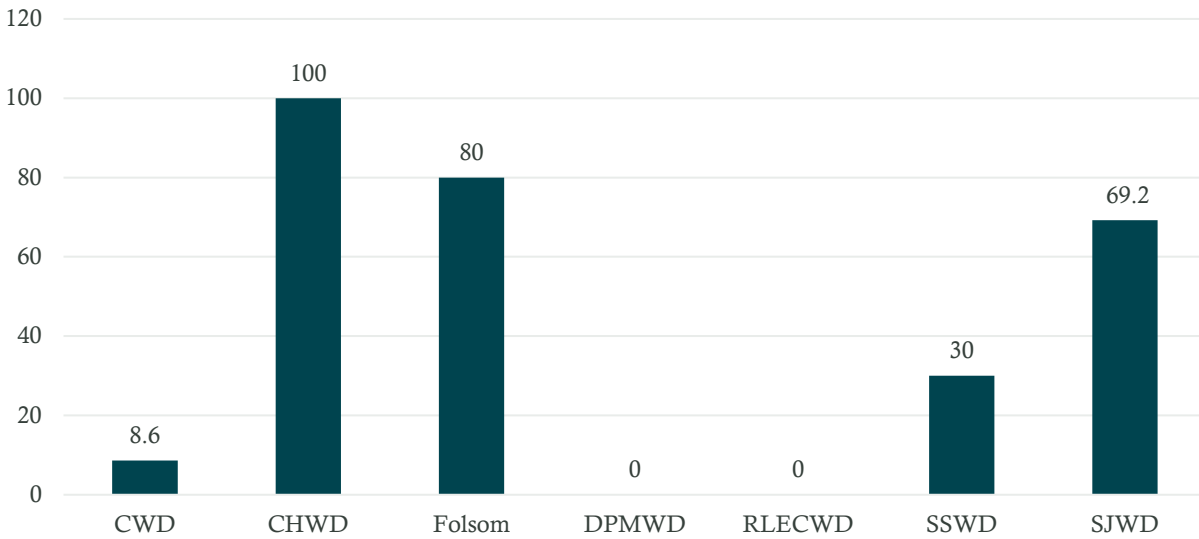
Shown in Table 7 are the annual volumes and costs of patch paving for each of the participating agencies. CIP investment related paving costs are often bundled with project work and were not considered as part of this assessment. DPMWD primarily has pipes located in backyards, so they typically have little to no paving. When possible, both the number of paving work orders and the square feet of paved area were collected to gauge volume and size of projects. Figure 21 shows the number of annual paving work orders. The number of work orders do not always equate to a larger size of square feet paved, as can be seen comparing CHWD and SJWD reported annual square feet paved to the number of work orders. Note that Central Valley Engineering and Asphalt has the CHWD and Folsom contracts and bid on SSWD, suggesting that there are regional contractors with scale and appetite for broader coverage.

Table 7: Annual Paving Volume and Cost

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Number of paving work orders (annual)	8.6	100	80	0	N/A	30	69.2
Square feet paved (annual)	N/A	11,000	N/A	0	N/A	8,319	9,000
Total spend (annual)	\$172,747	\$109,000	\$90,161	\$0	\$25,000	\$283,958	\$128,250

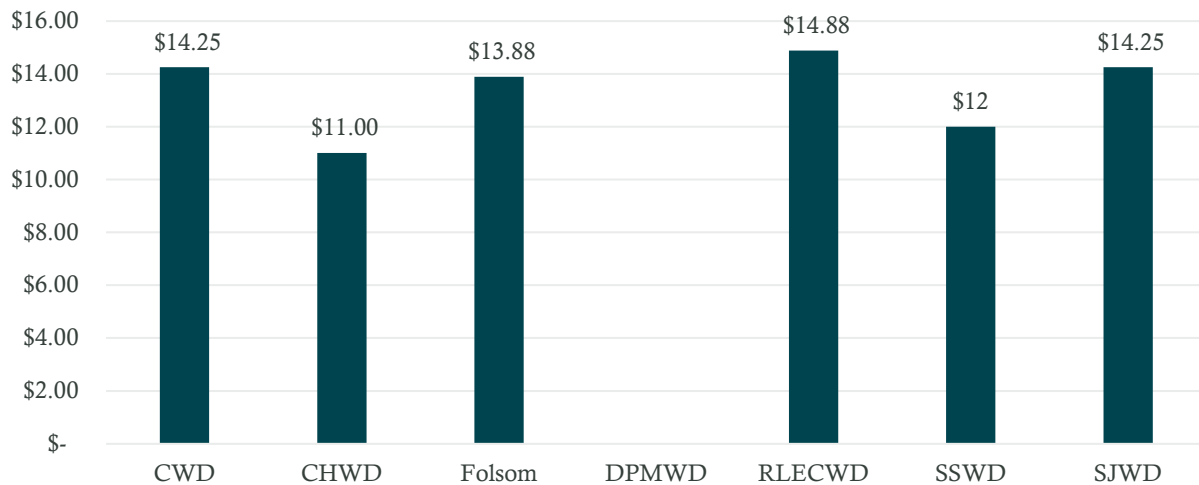
Contractor	Planet Paving and Grading	Central Valley Engineering and Asphalt	Central Valley Engineering and Asphalt	N/A	N/A	Various options including Central Valley Engineering & Asphalt and Flowline Contractors	Sierra National Asphalt
-------------------	---------------------------	--	--	-----	-----	---	-------------------------

Figure 21: Volume of Annual Paving Work Orders



The annual cost of paving has been normalized per square foot of paved area to better compare the paving costs. Figure 22 shows this comparison of paving cost. All the agencies with paving work are spending an average of \$13.65 per square foot paved.

Figure 22: Cost per Square Foot Paved



Stand-by / Emergency Operations

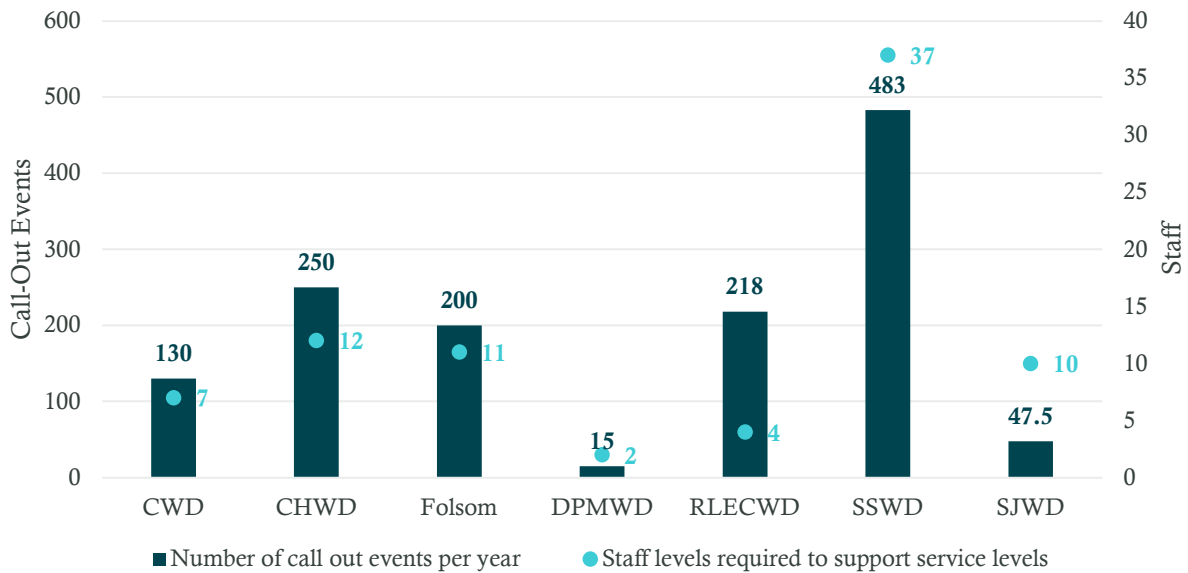
The number of emergency call out events each agency responds to annually is shown in Table 8. This table also shows the costs per year, the calculated costs per event, and the staff levels that are required to support the service levels currently provided.

Table 8: Annual Call Out Events

	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Number of call out events per year	130	250	200	15	218	483	47.5
Contract / in-house costs per year	\$86,190	\$87,565	\$127,990	\$14,758	\$43,184	\$379,382	\$26,281
Costs per event	\$663	\$350	\$640	\$984	\$198	\$785	\$553
Staff levels required to support service levels	7	12	11	2	4	37	10

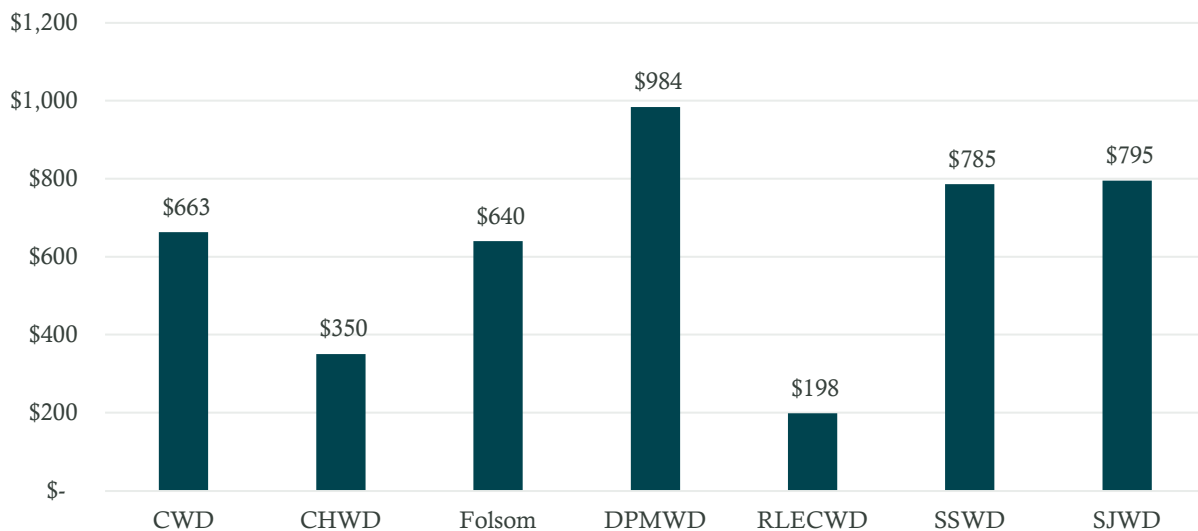
Comparing the number of call out events per year across the agencies as well as the staff levels required (Figure 23) shows that some agencies are staffed at a similar level to each other while the call out event volume is significantly different. In other cases, such as when comparing Folsom to RLECWD, the call out event volume is similar, but the staff level is very different. The numbers gathered reflect all after hours calls that resulted in an individual being dispatched regardless of whether it was a full crew or just the on-call individual.

Figure 23: Call Out Events per Year and Staff Levels Required



The annual costs of call out events have been normalized per call out event for comparison between agencies, as seen in Figure 24. CWD, Folsom, SSWD, and SJWD are spending near the same amount per event, whereas DPMWD is on the higher end and CHWD and RLECWD are both on the lower end of the group.

Figure 24: Costs Per Call Out Event



Water Conservation Programs

The participating agencies operate in a Mediterranean, but drought susceptible climate in the northern half of California's Central Valley. They share variable surface and groundwater supplies, which are coveted by other area users and those in the southern parts of the state. The water conservation program opportunity represents a chance to collectively and individually manage water usage by further encouraging efficient water use among customers. While reduced water usage can initially seem counter intuitive to a water utility because it presents the risk of revenue reductions (reduced volume consumed), well-designed practices can help to ensure water rates fully recover revenue requirements even on reduced consumption units.

A component of a water conservation program is education detailing water usage trends and resulting impacts on rates. As such, and as reflected in the collective appetites for pursuing this opportunity, the participating agencies should consider enhanced water conservation through collaborative action to be both financially viable and practically important to pursue. Indeed, it is both the last drought, and the next, that should motivate such action.

Figure 25 shows the annual costs of water conservation programs at each participating agency including salaried positions dedicated to water conservation as well as related programming and contract costs. The larger agencies (CHWD, Folsom, SSWD, and SJWD) have the highest total spend. However, as shown in Figure 26, CHWD, CWD and Folsom are higher in terms of conservation program spending per capita relative to SSWD and SJWD. A table detailing the many varied channels, enforcement mechanisms, events, incentives, management tools, and other programming and messaging activities that each participating agency engages in is detailed in Appendix B.

As the participating agencies consider their relative spending overall and per capita costs relative to peers, as well as the programmatic detail in Appendix B covering normal operations and drought only initiatives, each may find opportunities for enhancement through the various collaborative models to be explored in Activity 3. Those showing relatively higher spend per capita may achieve the same service levels with less expenditures through collaboration, and those showing less spend may find that enhanced service levels are not as unobtainable as they might have been alone. While the modes of collaborative action will be explored further in Activity 3, consider a scenario where staff time at each agency is being spent to develop different versions of the same water efficiency messages seven times, whereas a collaborative approach might allow for simply stamping each agencies logo on a menu of aligned regional messaging (as is done currently through RWA with 19 agencies participating including most but not all of the participants in this Study). This has the potential to free up often multi-tasking staff for other functional needs, thereby potentially either reducing contractor support needs or enhancing service levels.

Figure 25: Costs of Water Conservation Programs

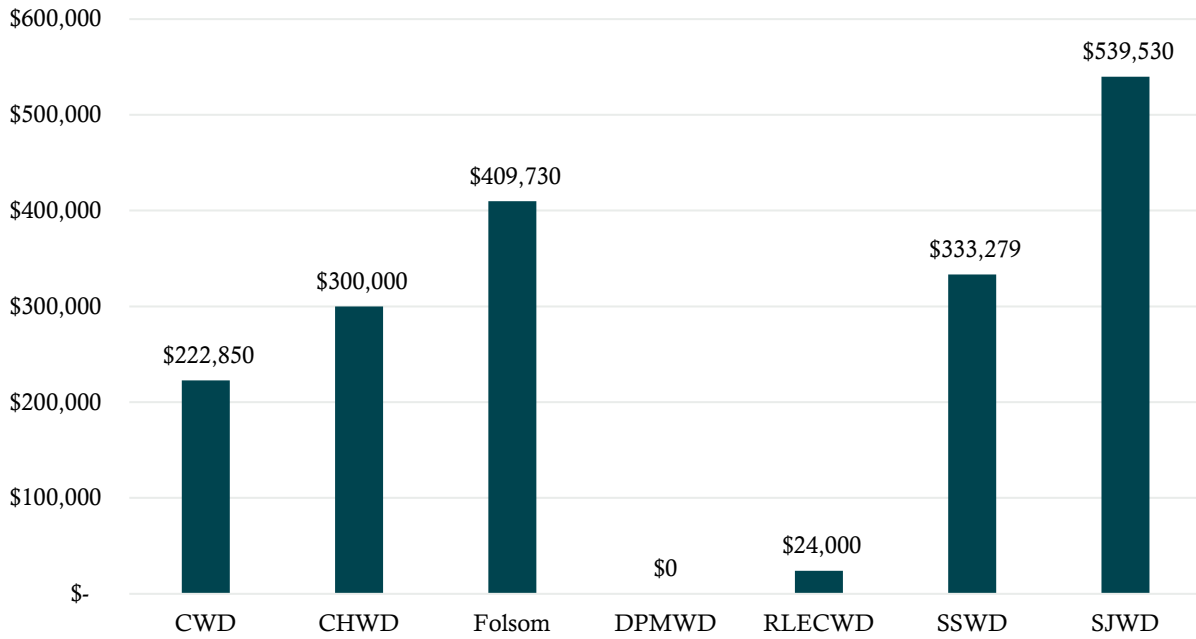
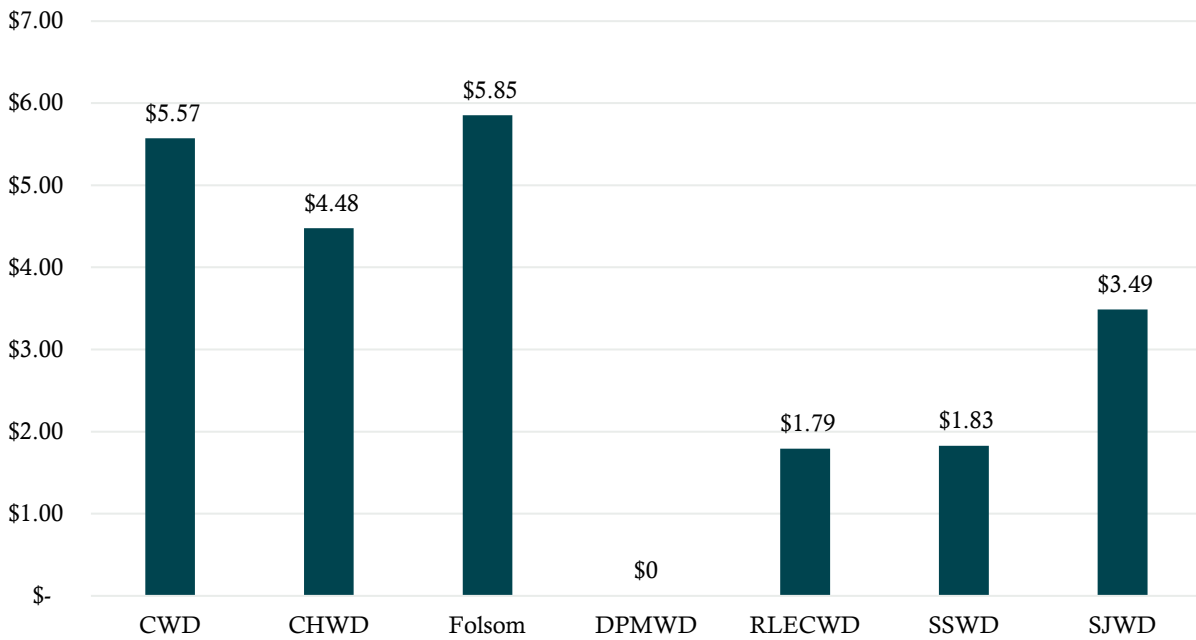


Figure 26: Costs of Water Conservation Programming Per Capita



Water Supply

The Sacramento Region's water suppliers have many opportunities to collaborate on preservation, distribution, and use of their water assets since the regional groundwater and surface water sources they depend on extend across and outside the service area boundaries of the various entities. They are also impacted collectively by changes in legislation and policy that apply broadly to regional or State-wide water management. This Study by the participating agencies should be a catalyst for further assessing regional water asset opportunities.

In the past four decades collectively the water agencies in the greater Sacramento Region have made great strides in diversification of water supplies and capital facilities associated with addressing drought, climate change, redundancy, reliability, groundwater overdraft (including creation of the Sacramento Groundwater Authority), emergency response and other factors. Within the agencies participating in this Study, examples of those facilities include improvements to SJWD's Sydney Peterson WTP, CWD's Bajamont WTP, the Cooperative Transmission Pipeline, the Antelope Transmission Pipeline, the Antelope Booster Pump Station and additional groundwater wells in CHWD. These facilities reflect millions of dollars of ratepayer dollars and State Grant funds coordinated through RWA to enable the agencies to conjunctively use the region's surface and groundwater assets as needed.

The total annual volume of the participating agencies' surface water and groundwater assets far exceeds the current and projected needs of their customers. However, the stagnant nature of the surplus water assets may have unanticipated long-term consequences. A fundamental tenet of California's surface water prior appropriation law is "use it or lose it" and the regional surface water supplies have not been fully utilized. This inability to put all surface water assets to beneficial use may jeopardize the future ability to retain those water assets or derive the maximum benefit available under the provisions of each water asset. Similarly, the continued water conservation regulatory actions further reduce the purveyor's actual water use that may limit long-term asset preservation despite purported legislative protections.

For those participating agencies that rely on groundwater exclusively or predominantly there may not be an obvious association with surface water supplies and the requirements associated with their use. Several suppliers indicated to Raftelis that they have adequate supplies now and into the foreseeable future, especially since per capita usage has trended downward and there is little significant growth in their service areas. This view may be shortsighted as groundwater withdrawal requirements can change and there could be unanticipated problems and/or limitations with groundwater resources for a variety of reasons. Furthermore, coordination between groundwater and surface water resources not only provides insurance against resource and policy changes but can also provide a revenue source. None of the participating agencies indicated that they are overfunded, and several noted the opposite, which should make revenue enhancement opportunities attractive.

As noted in the Task 1 Report, the participating agencies water assets total valuation approaches \$1 billion, without incorporating the economic activity spawned by reliable water supplies or the value of the infrastructure used to divert, treat, and deliver the supplies. The combined current water assets available to the participating agencies exceeds 300,000 acre-feet per year while the current water demands for the participating agencies totals approximately 100,000 acre-feet per year. The future

projected total demand for the participating agencies is approximately 137,000 acre-feet per year. As such, the agencies have more than 170,000 acre-feet of apparent surplus water that is not, and may not in the future, be put to beneficial use (and this figure excludes banked water assets). Table 9 shows the total water supplies and demands for the participating agencies and the banked groundwater supplies attributable to each participating agency. Of course, changes in policies or new studies on the resources could impact these supplies at any time.

Table 9: Participating Agencies Water Demands and Supplies⁸

Agency*	Current Demand (Annual)	Future Demand	Own Surface Supply	Contract Supply	Reasonable GW Capacity**	Future Surplus w/out GW	Future Surplus w/ GW
SJWD	12,000	13,000	57,200	25,000			
CHWD	12,400	13,100			5,000		
FOWD	8,800	9,600			8,343		
OVWC	3,500	3,900			500		
Ashland	1,100	1,100					
San Juan Family Totals	37,800	40,700	57,200	25,000	13,843	41,500	30,343
DPMWD	1,700	1,700			2,460		760
CWD	10,000	10,000	32,627		2,200	22,627	24,827
SSWD	29,000	39,567		55,064	135,493	15,497	150,990
Folsom	19,000	28,200	34,000			5,800	5,800
RLECWD	2,500	17,000			15,767		0
Other Agency Totals	62,200	96,467	66,627	55,064	155,920	43,924	182,377
All Agency Totals	100,000	137,167	123,827	80,064	169,763	85,424	212,720

*Data derived from recent planning documents

**Reasonable Groundwater Capacity is a yield less than maximum groundwater pumping capacity

Collaborative management of the regional water asset portfolio may provide additional dry year reliability protections, improved emergency response management, and potential revenue streams for participating agencies. For instance, the value of the underutilized water assets likely exceeds \$30 million in a conservatively priced short-term (annual) water transfer market if all of the supplies could be fully used and transferred. The long-term water asset value approximates \$250 million based upon

⁸ All units are in acre-feet (AF)

a permanent transaction water asset valuation of \$2,000 per acre-foot. Leveraging the financial value of even a portion of these water assets would provide alternative revenue streams that could be used for system improvements.

Many of the participating agencies also have additional water assets, like contracts with neighboring purveyors and banked groundwater assets that may be called upon to further support the water supply portfolio. For example, SSWD has contract supplies with the City of Sacramento and Placer County Water Agency that may also be considered in this collaborative effort. In addition, SSWD, CWD, DPMWD, and RLEWD have banked groundwater supplies that may provide utility in collaborative activities and these values have been excluded from Table 9. In short, Table 9 presents a conservative estimate of the total supplies available to the participating agencies.

Collaborative management and use of regional water supplies, through contracts or other mutually beneficial agreements for use and storage, will protect the water assets for each purveyor's benefit, improve dry year reliability, and potentially improve short-term and long-term revenue opportunities for all participating agencies. Differences in costs of production per unit of water produced as identified in Figure 5 also may suggest regional opportunity. Activity 3 will provide potential options to improve the collaborative efforts among the purveyors in water management and use.

APPENDIX A:

Number of Staff by Function



Appendix A 1: Number of Staff by Function

Function	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Water distribution	11	14	18.5	1.5	6	24	16
Water treatment	8	3	8.5	0.25	0	15	13
Engineering	2	5	2.5	0.25	0	10	4
Customer service / billing	3	2.75	2	0	2	6	5
Public relations/Water conservation	3	3.75	3	0	0	2	3
Finance	3	2.5	1	0.25	1	4	5
Human resources (HR)	1	1.75	0.4	0.25	0.05	1	1.45
Information technology (IT)	1	1	.2	0	0	3	1
Other	0	2.25	1	1.5	1	5	1
Total	32	36	35	4	10	70	48

Note: For the purposes of this table the minimum reported or estimated staffing level is 0.25 FTE for most reporting, however, agencies are welcome to refine this further in subsequent drafts.

APPENDIX B:

Conservation Programming



Appendix B 1: Water Conservation Communication Channels

Channels	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Website / scrolling banner	X	X	X			X	X
Social media	X	X	X				X
Online advertising		X	X			X	
Emails							X
Digital video	X					X	X
Messages for on-hold customers (phone system?)						X	
Print newsletter / mailers / bill inserts or on bill	X	X	X		X	X	X
Lobby brochures / water wise gardening literature	X	X				X	X
Local newspaper articles /ads	X	X	X			X	
Children's workbooks						X	
Welcome packets with efficiency messaging for new customers							X
Drought: Door-to-door messaging in high use neighborhoods		X				X	
Drought: Increase frequency of public outreach campaign interventions through usual media content	X	X	X			X	
Drought: Push info to media outlets (radio, print, web, TV)	X		X			X	
Drought: Develop and distribute drought information to customers	X	X	X			X	
Drought: Display signs alerting public of reduction drought stage in community or at district offices	X					X	

Channels (continued)	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Drought: Update website with current demand reduction information	X		X			X	
Drought: Work with outside groups to post District literature or links on respective websites, email lists, or meetings	X					X	
Drought: Special mailing to customers notifying drought stage requirements	X	X	X			X	
Drought: Restaurant water efficiency window stickers						X	
Drought: Manage to state imposed 32% reductions target						X	
Drought: Adding requirements of the water shortage contingency plan	X	X	X			X	

Appendix B 2: Water Conservation Enforcement Mechanisms

Enforcement Mechanisms	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Water waste patrol		X	X			X	X
Restricted watering times during midday hours			X			X	
Water use prohibitions (SSWD Regulation No. 15)						X	
Drought: State imposed 32% reductions target		X				X	
Drought: Adding requirements of the water shortage contingency plan	X	X	X			X	
Drought: Late night / early morning water waste patrol		X	X			X	
Drought: Restricted watering days		X	X			X	

Enforcement Mechanisms (continued)	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Drought: Change regulations to increased Water Conservation Stage in Regulation No. 15 based on severity of drought conditions or state mandates						X	
Drought: Develop/revise message and content to reflect reduction requirements.	X		X				

Appendix B 3: Water Conservation Events

Events	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Community outreach events and workshops / HOH/neighborhood association presentations	X	X	X		X	X	X
Irrigation efficiency education communications			X			X	X
Community outreach event, water efficiency workshop sponsorships (Rotary, Chamber of Commerce, Kiwanis)	X		X			X	
School water efficiency calendar art contest	X	X					X
School presentations	X	X				X	
Facility tours	X		X			X	
WaterSmart Classes / conservation related classes or trainings		X				X	
Water efficient garden tours						X	X
Drought: Increase in presentations to neighborhood associations, community groups, and schools.	X		X			X	
Drought: Increase school presence by offering presentations and materials	X					X	
Drought: Offer presentations to all local civic groups, HOAs, and neighborhood associations.	X					X	

Appendix B 4: Water Conservation Incentives

Incentives	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Free low flow outdoor components (hose end nozzles, hose timers)	X	X				X	
Free or promote low flow indoor appliance kits (low-flow bathroom or kitchen faucet aerators)	X	X			X	X	
Rebate programs (toilet=\$75-175, pressure reducing valve=\$150, clothes washers (\$50-100), pool covers, on demand hot water \$100)		X	X			X	X
RWA irrigation controller rebates (reduced to \$75)	X	X	X			X	X
Irrigation equipment rebates up to \$500, \$1500 commercial (heads or weather based timers, rain sensors)			X			X	X
Mulch program / giveaway						X	X
Rate structure that promotes efficient use per SB-606 and AB-1668			X		X	X	
Drought: Consider plumbing retrofit programs and increased advertising through public outreach efforts	X		X			X	
Drought: District will determine cost effectiveness and whether or not to offer additional rebates. i.e. smart -controllers, high efficiency washer, etc.	X		X			X	
Drought: High user surge to focus on contacting customers with higher use patterns in order to encourage participation in water efficiency programs and incentives (Top 20 percent of water users in each parcel acreage category)	X		X			X	

Appendix B 5: Water Conservation Management Tools

Management Tools	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Tracking usage at public facilities	X		X				
Tracking irrigation rebate program customer usage impacts			X			X	
Customer water usage is monitored each meter reading cycle to identify abnormal water use patterns and those customers are contacted.	X		X		X	X	X
Annual water loss submission and monthly reporting		X	X			X	
Customer portal for usage			X		X (pilot)	X	
AMI system that flags continuous use			X		X	X	
UWMP Public Notification		X	X			X	
Drought: High user surge to focus on contacting customers with higher use patterns in order to encourage participation in water efficiency programs and incentives (Top 20 percent of water users in each parcel acreage category)	X		X			X	
Drought: Utilize regional partnerships for messaging and implementation depending on purpose of water shortage stage declaration.	X		X			X	

Appendix B 6: Other Water Conservation Programming and Messaging

Other Programming and Messaging	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Messaging on efficiency stage						X	X
Messaging on indoor outdoor efficiency tips			X			X	X
Messaging on leak detection information						X	X
Encouraging reporting water waste						X	X
Messaging on native planting to attract wildlife						X	X
Residential water efficiency evaluations (WaterWise housecalls)	X	X	X			X	
CII water efficiency evals	X	X	X			X	
Private leak detection service / notifications / investigations	X	X	X			X	X
Water budget development			X			X	X
Drought: Additional staff and resources may be allocated to conduct an expected increase in requests for water audits, water efficiency device distribution, landscape budgets, and other programs offered as part of the Districts water efficiency program	X					X	

APPENDIX C:

Preventative Maintenance Activities



Appendix C 1: Preventative Maintenance Activities

Activities	CWD	CHWD	Folsom	DPMWD	RLECWD	SSWD	SJWD
Infrastructure maintenance	X	X	X	X	X	X	X
Dead-end or groundwater area flushing when quality issue	X	X	X			X	X
Hydrant maintenance / paint / flushing / greasing / inspecting	X	X	X	X	X	X	X
System-wide flushing			X		X		X
Valve exercising (mainline, blow off, hydrant valve, ARV/CARV)	X	X	X		X	X	X
Tank / storage reservoir inspections			X			X	
Large meter testing			X			X	X
Cathodic protection program						X	X