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Learning from California's Experience with Small Water System Consolidations

A WORKSHOP SYNTHESIS

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Acknowledgments and Review

This document synthesizes the discussions at a daylong workshop held at UC Berkeley on March 5, 2018, on “Learning from Experience with Small Water System Consolidations.” We are grateful for workshop participants’ willingness to share their time and expertise and to engage in open discussion about their experiences with small water system consolidation. The following people participated:

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All participants were given the opportunity to review and comment on a draft of this document. Additionally, the following people provided comments: Alf Brandt (California State Assembly), Alida Cantor (Portland State University), Jennifer Clary (Clean Water Action), Jeremy Damas (City of Ceres), Alesandra Nájera (Water Foundation), Gregory Pierce (UCLA Luskin Center for Innovation), and Ellen Simmons (UC Davis School of Law). Their thoughtful feedback helped inform the final version.

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Acronyms

IOU	investor-owned utility
JPA	Joint Powers Agreement / Joint Powers Authority / Joint Powers Agency
LAFCo	Local Agency Formation Commission
RCAC	Rural Community Assistance Corporation
TMF	technical, managerial, and financial (capacity)

I. Introduction

A. BACKGROUND AND NEED

California recognizes a human right to “safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.”¹ However, California’s small and disadvantaged² communities in both rural and urban contexts can find it especially challenging to fund the water system infrastructure, operations, monitoring, and maintenance necessary to achieve this goal.³ Small water systems⁴ that provide water to at least 15 service connections and serve water to fewer than a thousand people are responsible for the bulk of the state’s drinking water quality violations,⁵ and an estimated 300 disadvantaged communities in California are served by systems that fail to meet state drinking water standards.⁶ Other Californians rely on very small water systems or private domestic wells that lack state requirements for water quality testing and may be especially unreliable.⁷

Physical or managerial water system consolidations can create economies of scale that help address persistent water system inadequacies in small and disadvantaged communities. More than 100 consolidation projects have been completed or are ongoing in California,⁸ and many more communities are likely to pursue consolidations in the future. Drivers include the enactment of Senate Bill 88 (2015), which authorized the State Water Resources Control Board to require water system consolidations under certain circumstances; increasingly stringent drinking water standards⁹; and increasingly frequent emergencies, like droughts and fires,¹⁰ that expose water system vulnerabilities. During the current legislative session, legislators have introduced a handful of proposals to address perceived needs related to consolidation.¹¹

While consolidation offers many potential benefits for communities served by unreliable water systems, the legal, institutional, financial, and political costs, benefits, information gaps, and best practices associated with consolidations have not been well documented. Taking stock of past and current consolidation efforts—and the lessons they provide—will help accelerate cost-effective

solutions for California communities that both address near-term water needs and enhance long-term water system resilience.

B. THE WORKSHOP AND THIS SYNTHESIS DOCUMENT

This document synthesizes the discussions at a daylong workshop held at UC Berkeley on March 5, 2018, aimed at “Learning from Experience with Small Water System Consolidations.” The workshop brought together recognized thought leaders in water system management, law, and policy, including key practitioners, academics, stakeholders, and decision makers. The goals of this effort include the following:

1. Identifying what participants perceived as the lessons learned and emerging issues from California’s experience to date with small water system consolidations;
2. Raising the level of dialogue among key stakeholders and decision makers who are actively involved with consolidations;
3. Facilitating joint learning and development of shared knowledge among thought leaders in the field;
4. Laying the groundwork for additional dialogue and research; and
5. Informing legislative and administrative agency policies.¹²

The following pages provide a concise summary that reflects the authors’ synthesis of a range of viewpoints expressed during the facilitated workshop discussions. The goal of this document is to present participants’ perceptions of their experiences and lessons learned, rather than to draft an in-depth research report. While participants were asked to review a draft to ensure that discussions were accurately captured, the factual assertions presented here were not independently vetted for accuracy.

II. Setting the Baseline for Productive Dialogue

Clarifying what is meant by water system consolidation and defining the types of problems consolidation is intended to address is an important first step towards a productive dialogue.

A. WHAT IS CONSOLIDATION?

While consolidation has sometimes been defined narrowly as a larger water system subsuming one or more small water systems, workshop participants favored a relatively broad definition of consolidation that includes a spectrum of collaborative efforts to merge aspects of two or more water systems that provide drinking water for residential use, or to extend drinking water infrastructure and service to communities or households not connected to a publicly regulated system (such as those relying on private domestic wells).

Wastewater system consolidation is an important and closely related issue that was beyond the scope of the workshop.

A Broad Definition of Consolidation

This broad definition encompasses both physical and non-physical consolidations, which may be partial or complete. *Physical consolidations* involve the merging or sharing of physical infrastructure, such as distribution pipelines or water treatment facilities. *Non-physical consolidations* (sometimes described as “managerial” or “operational”) involve sharing financial, managerial or technical capacity, such as through shared billing, equipment sharing, and shared staff or consultants. In practice, consolidations can combine elements of both

Workshop participants described the following scenarios as examples of consolidation:

- A larger water system—or a small water system with greater resources and capacity—subsuming one or more neighboring water systems;
- A water system extending service to one or more neighboring communities that previously relied on private domestic wells; and
- Two or more water systems, including at least one small water system, combining some or all their physical or managerial functions to create additional capacity.

What is Water System Regionalization?

Because the term “regionalization” has been used in policy proposals intended to ease or encourage consolidations (or consolidation-like efforts), workshop discussions touched on the concept of water system regionalization and how it differs, if at all, from consolidation. Some participants described the distinction as based primarily on scale. While some consolidations might involve only two water systems (or one water system and a number of households that previously relied on private domestic wells), water system regionalization involves more than two systems and, potentially, a much larger geographic area, such as an entire county or watershed. In this view, water system regionalization is likely to be more institutionally complex than a two-system consolidation, but their goals and outcomes are functionally similar. On the other hand, some participants suggested that regionalization might involve water partnerships—including joint ventures and formal agreements—that do not undertake the degree of integration generally associated with consolidation. Whether and how these distinctions matter in practice could be explored in more detail in future work.

Participants mentioned the existence of financial incentives for multi-system consolidations. Specifically, consolidations that involve at least three water systems with chronic compliance problems, including at least one disadvantaged community, may be eligible for more state funding than two-system consolidations.

B. WHAT PROBLEMS IS CONSOLIDATION INTENDED TO ADDRESS?

The main driver for consolidation is small water systems' challenges delivering adequate service at a reasonable cost. Small systems may lack the economies of scale needed to support adequate technical, managerial, and financial (TMF) capacity over the long term and to enable cost-effective responses when water quality or quantity challenges arise. These problems are explored briefly below.

The High Costs of Providing Water: Diseconomies of Scale

Like other utilities, domestic water delivery benefits from economies of scale. Larger water systems may be able to provide safe, reliable drinking water at a lower cost per individual customer by spreading capital, operations, and maintenance costs over a larger pool of ratepayers. Because facilities and operating costs do not scale linearly, small systems may need to charge significantly higher rates to provide a comparable level of service. Rates for some small, disadvantaged communities far exceed commonly used affordability thresholds (~1 to 3 percent of median household income).

Inadequate Technical, Managerial, and Financial Capacity

Due to their higher capital and operational costs per person, small water systems can find it challenging to maintain the TMF capacity necessary to meet critical needs, such as hiring experienced staff, conducting rate studies to determine the true cost of providing water service, or investing in and effectively managing physical infrastructure and other system assets over the long term. Many small systems don't have a full inventory of their assets or the condition of those assets, and may essentially be running their assets to the point of failure because they are unable to maintain or replace them.

Insufficient TMF capacity can create a vicious cycle of instability. Small systems that fall out of compliance with state and federal safe drinking water requirements, especially those serving disadvantaged unincorporated communities, often lack access to public financing or

private credit markets. To be eligible for grant funding to come back into compliance, a small system must meet TMF capacity thresholds. Even if a small system receives grant or loan funding to cover one-time capital costs, the system still faces high ongoing costs. Operations and maintenance costs, financial penalties for non-compliance, and debt service payments must still be borne by the system and its ratepayers.

Water Quality and Quantity Challenges

Although larger water systems can also face considerable challenges, small systems may have more difficulty acquiring and maintaining a clean, reliable residential drinking water supply. The challenge is especially acute for small disadvantaged communities that are largely, or entirely, reliant on groundwater, notably in the San Joaquin Valley and Central Coast regions, but likely also in other areas of the state.

A small water system may not be able to remedy water quality problems on its own. Installing and maintaining a treatment system to address contamination or acquiring an alternative, uncontaminated water supply may be cost-prohibitive. The number of small water systems with water quality compliance issues is likely to increase with time. As detection technology continues to improve, very low concentrations of some contaminants are found to be hazardous, and the state sets more stringent water quality standards, more small systems will have difficulty meeting their obligation to provide safe drinking water.

Small water systems that rely on a single source of water and communities that use private domestic wells may have significant water quantity reliability problems. For example, communities that rely on groundwater may see their shallow wells go dry due to groundwater overdraft. Residents of a number of California communities, like East Porterville, faced this problem during the recent drought. They may lack the resources to drill deeper wells, or deeper groundwater may be unavailable or contaminated. Groundwater overdraft can also affect water quality by increasing pollutant concentrations. Climate change is expected to increase the frequency and severity of droughts and, with them, of water quantity challenges.

ALTERNATIVES TO CONSOLIDATION

Consolidation can help address problems by making more efficient use of resources, increasing system capacity, and spreading costs over more ratepayers. However, there may be other means of addressing struggling water systems' problems. Participants identified a number of potential alternatives to consolidation. Some (marked "Δ") may overlap with part of the spectrum of actions included in the broad definition of consolidation articulated at the workshop.

Alternatives that may preserve system autonomy:

- Shared services agreements Δ
- Joint use agreements Δ
- Water purchases and exchanges Δ
- Installing point-of-use treatment systems

Alternatives that may override system autonomy:

- Court appointed receiver
- State Water Resources Control Board appointed administrator

Alternatives related to crisis response:

- Mutual aid agreements Δ
- Emergency interties Δ
- Contracts for bottled or hauled water

In some cases, an alternative may preclude the need for consolidation. However, in other cases, an alternative may be an incomplete or interim solution to a small system's long-term problems. These may (or should) eventually lead to more permanent alternative solutions or (further) consolidation efforts.

III. Characterizing Consolidations

There is a range of experience with consolidations in California which, to our knowledge, has not been robustly analyzed. While a systematic examination of consolidation is beyond the scope of this project, we solicited information from workshop participants about their experiences with consolidation through an informal survey exercise and facilitated discussion. This included information about (1) what consolidation efforts the participants and their organizations have been involved with, (2) what factors have influenced, or should inform, consolidations, and (3) how consolidations have been or could be structured.

Through the informal survey exercise, participants provided information on ~130 examples of water system consolidation efforts. Of these, participants characterized ~62% as past efforts, ~14% as in process efforts, ~22% as potential efforts, and ~2% as failed efforts (Figure 1). There are likely many other consolidation efforts workshop participants did not have direct knowledge of.

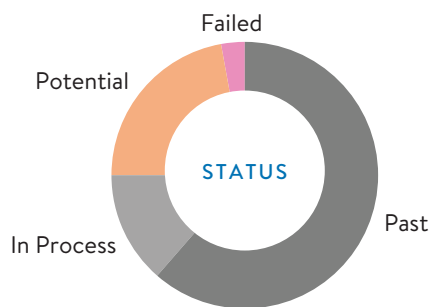


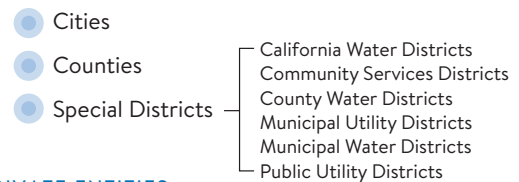
Figure 1: Status of the consolidations identified by workshop participants

A. WHAT FACTORS INFLUENCE THE NEED FOR, TYPE, PROCESS, AND DETAILS OF CONSOLIDATION EFFORTS?

Many factors can influence consolidations, how they come about, and how they are structured. Participants emphasized that there is no unifying factor driving all

consolidations. The nature and structure of a consolidation will depend on local conditions and the needs and concerns of the parties, which may change over time.

PUBLIC ENTITIES



PRIVATE ENTITIES

- Private domestic well owners
- Mobile home parks
- Common-interest developments
- Mutual water companies
- Investor-owned utilities (IOUs)

Figure 2: Types of entities that own water systems and infrastructure which may be involved in consolidations

Water System / Infrastructure Ownership

The water systems and infrastructure involved in consolidations may be owned by public or private entities (Figure 2). These different forms of ownership bring with them different authorities, constraints, opportunities, and incentives that may be relevant to consolidation.

For example, state tax policy (set by three voter initiatives—Propositions 13, 218, and 26—that amended the California Constitution) limits local governments' ability to increase fees and redistribute revenue. As a result, the rates a public agency-owned water system charges must not exceed the proportional costs of the water service attributable to the parcel. It cannot subsidize low-income customers by charging other customers higher rates for the same level of service, which may reduce the affordability of consolidations for low-income individuals and communities.

Mutual water companies are user-owned, non-profit water companies that, except for limited exceptions, provide water only to their shareholders/members. Investor-owned utilities (IOUs) are for-profit water corporations that are regulated by the California Public Utilities Commission. Some large IOUs have multiple service areas located across the state. Unlike public agencies, they can redistribute rate revenues between service areas and customers, for example, to fund low-income ratepayer assistance programs. Future research could explore relevant authorities, constraints, opportunities, and incentives for each type of water system ownership.

Participants characterized the majority (~61%) of the consolidation efforts they identified through the informal survey exercise as involving some combination of public and private entities (including private domestic well owners), ~23% as involving only public entities, and ~16% as involving only private entities (Figure 3).

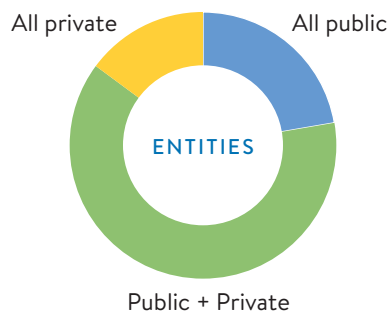


Figure 3: Types of entities involved in the consolidations identified by workshop participants

Other Water System and Community Characteristics

Other characteristics of the entities involved in a consolidation play an important role in determining the utility and feasibility of different consolidation options. These include:

- Water system size / population served
- Proximity to potential partners
- Urban or rural nature of communities, including:
 - Whether they are incorporated or not
 - Community history
- Source(s) of water supply
- Prevalence of private domestic wells

- Type and scope of water quality problem(s)
- Type and scope of water quantity problem(s)
- Local hydrology
- County and city land-use practices
- Degree of engagement in local planning
- History of crises
- Financial capacity, including:
 - Existing liabilities
 - History of underinvestment
- Technical capacity
- Managerial capacity
- Social characteristics, such as:
 - Community cohesion / social capital
 - Race, ethnicity, and class composition
 - Presence of disadvantaged communities

Affected Parties and Their Concerns

Although consolidation affects a wide variety of parties with differing interests, participants indicated that the following groups tend to be particularly active in the consolidation space: residents of the affected community and the receiving community; water system boards, staff, consultants, and customers; mutual water companies; IOUs; local governments, including cities, counties, special districts, and groundwater sustainability agencies; Local Agency Formation Commissions (LAFCOs); and state agencies, including the State Water Resources Control Board, California Public Utilities Commission, and Department of Water Resources.

These parties may have specific concerns that make some consolidation options appear more or less attractive to them. Although some of those concerns may be addressed or mitigated by the way a consolidation is structured, others may persist. We explore parties' concerns in more detail in the next section.

Funding Availability, Access to Credit, and Incentives

Funding and funding-related incentives are important determinants of whether and how consolidations occur. For example, certain funding sources include grant funding that can only be used for consolidations involving a disadvantaged community, and water systems can double their funding if three or more water systems merge. Nonetheless, some participants suggested that the State's

dollar-based caps on total project funding can drive down the size of a consolidation, leading proponents to split larger consolidation projects into smaller pieces that fit under the cap and significantly increasing the transaction costs of consolidation. And, critically, state tax policy restricts local governments' ability to raise the rates they charge their customers—an issue that privately owned water systems do not share—limiting these public agencies' ability to raise capital.

Legacy of Discrimination

Where a legacy of discrimination and underinvestment exists, it affects a community's need for, capacity to pursue, and ability to afford consolidation. Participants identified this factor as critically important for understanding why some small systems, especially those serving disadvantaged communities, are in the positions they are in today. Many small disadvantaged communities, and the water systems that serve them, face challenges which result from decades of racially discriminatory land use practices and systematic underinvestment, some of which has been documented in legal proceedings, and which may continue today. Historical and ongoing discrimination have salience for how the state should prioritize current and future investments of resources, what institutional arrangements and structures may be preferable, and other issues relevant to consolidation.

Crises

Participants pointed out that crises that expose water system weaknesses can provide strong motivation for consolidation by demonstrating—and, sometimes, creating—a clear need for action. For example, in parts of the San Joaquin Valley during the drought, hundreds of domestic wells went dry. The scale of East Porterville's crisis led to rapid state action to provide emergency drinking water and relatively rapid state action to extend water service from the neighboring City of Porterville. Similarly, after a massive wildfire destroyed several water systems' infrastructure in Lake County, small water systems and communities that had previously shied away from consolidation recognized the need for it when faced with the high cost of rebuilding those water systems.

B. HOW HAVE CONSOLIDATIONS BEEN STRUCTURED?

Consolidations have been implemented through a spectrum of institutional arrangements and structures. Participants emphasized that consolidation possibilities should be considered fluidly, as a continuum. Over-defining or over-categorizing possibilities could lead decision makers to overlook potentially useful options or combinations of options. Among the possibilities participants mentioned were Joint Powers Agreements / Authorities / Agencies (JPAs) to study regional solutions, mutual aid agreements, arrangements for shared bookkeeping and billing or shared operations staff, water exchanges or wholesale agreements, emergency interties, shared treatment plants, annexation of unincorporated areas into cities, extraterritorial service agreements, and water system purchases. There are many different ways to think about these structures. We present two potential models, based around the workshop discussions, here.

As Part II.A suggests, one way to differentiate consolidations is on the basis of their functionality. In other words: Do they involve the merging of managerial functions and capacity, physical functions and capacity, or some combination of both? Participants characterized the consolidation efforts they identified through the informal survey as ~8% managerial, ~20% physical, and ~73% a combination of the two (**Figure 4**).

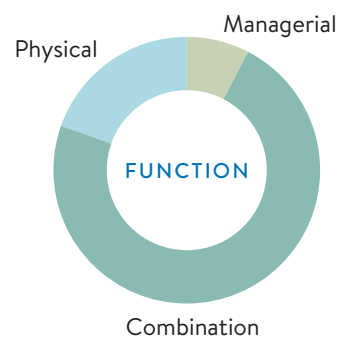


Figure 4: Functions of the consolidations identified by workshop participants

Figure 5 illustrates how the institutional arrangements and structures listed above might be organized by function.

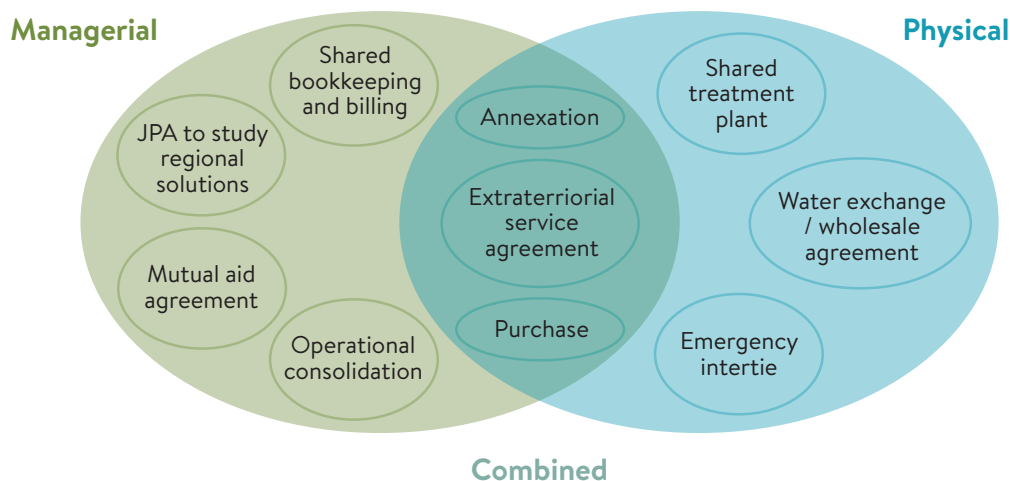


Figure 5: Variation in the function of institutional arrangements and structures

Participants also discussed how different institutional arrangements and structures might affect the degree of autonomy retained by a small water system's users following consolidation. **Figure 6** illustrates how the institutional arrangements and structures shown in **Figure 5** might be organized by degree of retained autonomy. For example, mutual aid agreements for emergency assistance may increase system resilience and reliability while allowing community members to maintain a relatively high degree of control over the day-to-day operations of their water system, as well as

direct access to their water provider. But community members' decision-making ability in those contexts may be constrained by resource limitations and other factors. Conversely, small systems that merge with a city, a water district, a mutual water company, or an IOU may lose local control over their water system or be far removed from their water provider's corporate offices. Different aspects of autonomy may be affected by consolidation, and how to manage tradeoffs between them is an important question.

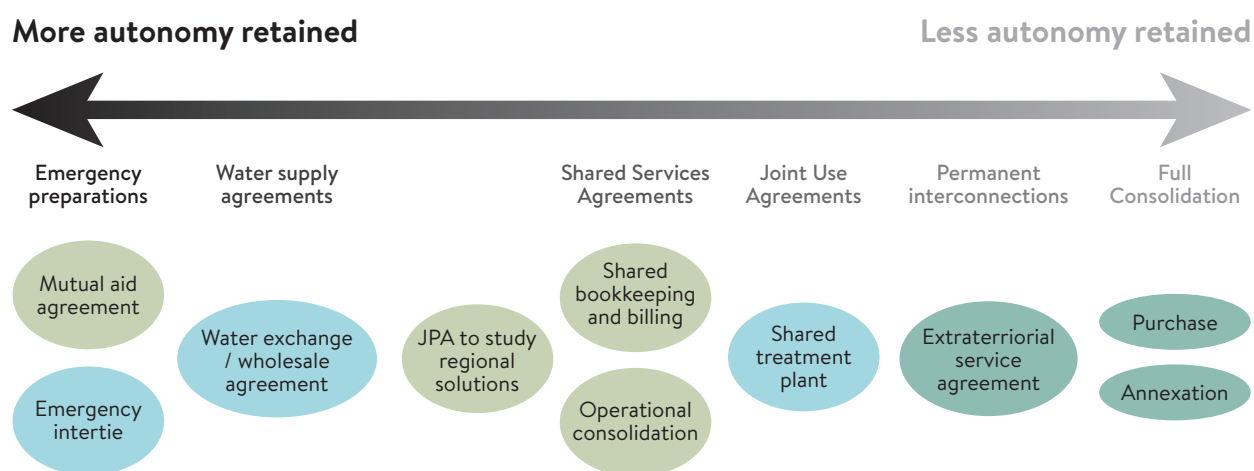


Figure 6: Variation in the degree of autonomy retained by small water system users for different institutional arrangements and structures

IV. Identifying Barriers to Effective Consolidations and Potential Solutions

A range of barriers can make pursuing consolidations, and implementing them effectively, challenging. These include information gaps, changing regulatory standards, challenges associated with affordability and funding, distance, resistance from different sectors, the state preference for full consolidation, the length and complexity of the consolidation process, and the scope and use of the State Water Resources Control Board's authority to mandate consolidation.

Participants considered ways to address some of these barriers by translating their experience with small water system consolidations into potential solutions.

A. INFORMATION GAPS

There are many information gaps associated with consolidations. Examples mentioned by participants included the following:

- A lack of available data needed to understand the scope of drinking water quality and quantity problems for private domestic wells and some state small water systems, such as information about the distribution of private domestic wells that do not meet drinking water standards or are at risk of going dry during a drought;
- A lack of data on water rates and affordability;
- A lack of information about the benefits of consolidations, such as information about changes in property value associated with addressing water problems, the cost-savings associated with managerial consolidations, improved reliability for receiving systems related to increased capacity / redundancy, and the long-term health benefits of addressing drinking water contaminants; and

- A lack of information about how different consolidation arrangements and structures may affect the autonomy retained by small water system users.

POTENTIAL SOLUTIONS FOR INFORMATION GAPS

- Gather and organize existing data sets for private domestic wells (e.g., location, depth, water levels, and water quality).
 - Require periodic water quality testing of private domestic wells, targeting contaminants of local concern.
 - Analyze the long-term costs and benefits of different types of consolidations to receiving systems, subsumed systems, cooperating systems, and the state. E.g.:
 - Analyze pre- and post-consolidation water rates, water affordability, and property values.
 - Analyze cost-savings and other benefits of managerial consolidations.
 - Evaluate the benefits of improved reliability for receiving systems.
 - Estimate the long-term health benefits of consolidations.
 - Estimate avoided emergency water costs.
 - Quantify the costs of private domestic well ownership, operation, and maintenance.
 - Analyze how the degree of autonomy small water system users retain differs for different consolidation arrangements and structures.
-

B. CHANGING REGULATORY STANDARDS

Changing standards for drinking water quality affect the number of small water systems that are out of compliance. For example, California's standard for Chromium-6 was challenged in state court and invalidated for failure to consider economic feasibility. A similar challenge has been filed against the State's recently adopted standard for 1,2,3-trichloropropane. After the Chromium-6 standard was invalidated, hundreds of non-compliant systems immediately became compliant systems. There is significant uncertainty surrounding the standards water systems will be held to, which has implications for which water systems could be subject to mandatory consolidation orders and makes it more difficult for small systems to pursue consolidation efforts.

Safeguarding public health is crucial and is a central potential benefit of consolidation. Participants emphasized that systems with high contaminant treatment costs need state-level programming and funding to help them come into compliance with new water quality standards. They suggested that the state consider how to effectively remedy noncompliance in concert with developing new or more stringent drinking water standards.

POTENTIAL SOLUTION FOR CHANGING REGULATORY STANDARDS

- Proactively roll out a targeted consolidation funding strategy as part of the implementation plan for new stringent drinking water standards.
-

C. AFFORDABILITY AND FUNDING CHALLENGES

Affordability and the availability of external funding are potential barriers to consolidation.

Water Rate and Affordability Issues

As **Part III.A** mentioned, participants noted that California voters have amended the state constitution to place limits on public water agencies' ability to redistribute rate revenues across the communities and customers within their jurisdictions. Local government providers cannot charge water customers more than the cost attributable to providing water service to them, including maintaining a reasonable reserve fund. Chronically underfunded water systems run by public entities face additional challenges because they may not be able to afford to conduct the rate studies that would demonstrate need and justification for raising their (artificially) low water rates to reflect the true costs of providing reliable water service.

Receiving systems may have significant leverage in consolidation negotiations, and sometimes charge customers from a subsumed system excessive rates. Participants described some cities as charging customers from subsumed systems rates that are 150% of those they charge their existing city customers, sometimes failing to draw a clear connection between the actual costs to the city of providing the service and the higher rate. Furthermore, cities' cost analyses may not properly account for the assets and liabilities of a subsumed system.

There may be large differences in what rates are affordable in different regions and for different populations within a particular region, and merging these populations together under a single system may result in unaffordable rates for disadvantaged communities, potentially changing the calculus of which potential solutions are likely to be the most cost-effective. For example, managerial consolidations may be effective, more affordable options than full consolidations in some cases.

POTENTIAL SOLUTIONS FOR WATER RATE AND AFFORDABILITY ISSUES

- Develop methods and metrics to represent the distribution of benefits and burdens of consolidation in a systematic and fair way.
 - Perform a comparative analysis of the financial authorities, constraints, opportunities, and incentives relevant to consolidation for each type of public or private water system ownership.
 - Explore the possibility of a legislative change to the statutory definitions applicable to Proposition 218 that would deem water rates not to have increased when higher charges are required to implement a public health and safety requirement.
 - Consider affordability when selecting consolidation structures.
 - Ensure that receiving systems charge newly consolidated customers rates that reasonably reflect the costs of serving them, for example, by including a “social equity” clause in consolidation agreements that preserves community and public participation, prevents unregulated privatization, and establishes rate protections.
 - Phase in rate increases related to consolidation over time, rather than all at once.
-

Grant and Loan Issues

Given the need to address legacy infrastructure deficits in many small systems, the limited availability of funding to support consolidation efforts is a central issue. For example, the most significant recent water infrastructure bond, Proposition 1, includes funding for technical assistance for consolidations involving physical infrastructure (most of which has already been distributed or is already spoken for), but it does not allow systems to use technical assistance funds to improve TMF capacity—for example, through a managerial consolidation—unless there is an accompanying Prop 1 eligible construction project.

Beyond the lack of funding available for consolidation efforts, there are a host of funding-related issues. For example, disadvantaged communities in unincorporated areas may lack the managerial capacity to apply for and

manage grants and loans, be unable to convince elected officials or qualifying agencies to apply for grants on their behalf, or may be unable to access public and private financing due to their lack of credit and collateral. Lack of access to credit is an especially acute problem for public entities that manage water systems, which may find it challenging to raise their rates to pay up front for system improvements.

Furthermore, funding often hinges on a system having sufficient TMF capacity, a classic catch-22 that can preclude efforts to build the necessary capacity in the first place. Furthermore, a system’s eligibility status can change between the time it applies for funding and when funding becomes available. The risk of falling out of eligibility is exacerbated by the long, multi-step process usually followed for consolidations.

POTENTIAL SOLUTIONS FOR GRANT AND LOAN ISSUES

- Develop a proactive state plan to build capacity and target funding to solve drinking water problems in communities that have experienced historical underinvestment.
 - Modify grant guidelines to include a clear definition of TMF capacity designed to support desired outcomes.
 - Provide technical assistance funding for managerial consolidations.
 - Pursue funding from sources less commonly used for consolidations, such as Federal Emergency Management Agency hazard mitigation funds or Integrated Regional Water Management funding.
 - Create sustained, state-level funding sources for addressing drinking water quality problems, such as taxes and fees on the use of common water pollutants like fertilizers and pesticides.
 - Expand permanent low-interest loan programs, like the State Revolving Funds, to increase ongoing funding.
 - Authorize the State Water Resources Control Board to require regionalization of small, chronically out of compliance public water systems and to collect fees to support it.
 - Analyze what factors affect the ability of different types and sizes of public and private entities to raise capital.
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D. DISTANCE

As a rule of thumb, physical consolidations are generally only considered cost-effective for water systems within 3 miles of one another. In practice, the limit is closer to 1 mile, because the maximum project grant limits for current state funding programs will not accommodate the expense of long distance physical connections.

But proximity is not just an issue for physical infrastructure connections. It is also a concern for managerial consolidations. These consolidations require staff or consultants to travel between the systems they manage. Participants suggested that driving times of more than one hour reduce the productivity and efficiency gains of managerial consolidation.

POTENTIAL SOLUTIONS RELATED TO DISTANCE

- Expand UC Davis' study (which found that 66% of San Joaquin Valley disadvantaged communities were within 500 feet, and 85% were within 3 miles, of a compliant system) to the whole state.
 - Explore consolidation possibilities with a wider variety of IOUs and mutual water companies, which may provide opportunities for creative managerial consolidations and have access to different funding sources than water systems owned by public entities.
-

E. RESISTANCE FROM DIFFERENT SECTORS

As noted above, the many parties affected by consolidation will have different concerns about consolidation. These concerns may manifest as resistance to consolidation in general, or to certain consolidation options. Participants discussed the following sources of potential resistance: (1) resistance from small systems and their residents, (2) resistance from receiving systems and their residents, and (3) resistance from consultants and contractors.

Resistance from Small Systems and Their Residents

Resistance to consolidation efforts by small water systems and the communities they serve may derive from a number of sources, including lack of knowledge about (1) the water quality problems facing the system and community and the effect of those problems on residents' health and safety, (2) the condition of the system's infrastructure and the cost of maintenance or repair, and (3) artificially low rates that haven't covered the costs of infrastructure maintenance or replacement and the true costs of managing a sustainable water system over the long term, which can result in sticker shock. Other concerns relate to the effect consolidation could have on community land uses, the likelihood of increased enforcement attention, and a lack of representation and accountability in the receiving system.

Additionally, individual interests may be at odds with community needs, such as the desire of a water system's board and staff to keep their jobs, or landlords who don't want to pay for improvements that they see as primarily benefitting their tenants.

POTENTIAL SOLUTIONS FOR RESISTANCE FROM SMALL SYSTEMS AND THEIR RESIDENTS

- Allow community members to petition the State Water Resources Control Board for consolidation with a compliant system.
 - Provide community members with specific, relevant information about why consolidation may be helpful and why and how water rates would change after consolidation.
 - Ensure representation and/or involvement of subsumed communities (e.g., by maintaining the board of a subsumed water system as an advisory body, by adding representatives of the subsumed community to the board of the receiving system, etc.).
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Resistance from Receiving Systems and Their Residents

Receiving systems and their residents may resist consolidation efforts for various reasons. For example, they may be reluctant to take on the debt, tax liability, or non-compliance penalties that a small system may have accrued. Participants noted that receiving systems and their residents often perceive a small system's non-compliance as "someone else's problem," and that the receiving community may believe it should not have to "subsidize others" who did not take care of or invest in their water system. Receiving systems and their residents may also assume, sometimes accurately, that disadvantaged community residents will be unable to pay their bills. These perceptions and assumptions may rest in part on the idea that poverty is the result of failure to take responsibility instead of the result of a legacy of underinvestment. They may also rely on certain assumptions about the benefits and burdens associated with consolidation that do not necessarily bear out.

POTENTIAL SOLUTIONS FOR RESISTANCE FROM RECEIVING SYSTEMS AND THEIR RESIDENTS

- Articulate the costs and benefits (e.g., increasing local water security, improving economies of scale, etc.) of consolidation to receiving systems.
 - Require cities and counties to create plans to ensure access to safe, affordable drinking water in their communities, and tie plan implementation to state funding incentives.
 - Introduce additional liability protections for receiving systems in consolidations.
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Resistance from Consultants and Other Contractors

Consultants that currently contract to provide services to multiple water systems may prefer to maintain those separate contracts in order to maximize their personal income. This potential individual conflict of interest might motivate contractors to counsel their clients against consolidation, even when consolidation may be in the best interest of the system and its residents.

F. STATE PREFERENCE FOR FULL CONSOLIDATION

Participants noted that state programs tend to prioritize or incentivize full consolidations. For example, technical assistance funding from Proposition 1 must be tied to a construction project, even though a managerial consolidation may be sufficient and much more cost-effective, or may be a cost-effective stepping stone on the road to full consolidation.

At the same time, participants noted that partial solutions (using a "Band-aid" approach)—for example constructing an intertie—may reduce incentives to resolve underlying problems, such as failing or inadequate infrastructure like wells or treatment facilities.

POTENTIAL SOLUTION FOR ADDRESSING THE ISSUE OF STATE PREFERENCE FOR FULL CONSOLIDATION

- Provide funding for technical assistance related to managerial consolidations.
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G. LENGTH AND COMPLEXITY OF THE CONSOLIDATION PROCESS

Even when all parties are willing to consolidate, participants noted that consolidations are generally long, multi-phase processes that require working through many different layers of bureaucratic red-tape and approvals. It takes time and resources to obtain state permits and funding, comply with systems' internal rules to authorize consolidation, obtain LAFCo approvals, etc. The process is difficult and often overwhelming for small systems that lack TMF capacity to move through these steps quickly and efficiently.

Notably, the City of Porterville's extension of service to East Porterville residents navigated bureaucratic approvals relatively quickly during and after the recent drought. Participants suggested that the central role the State played throughout that effort, and the State's ability to work with community organizations to deal directly with East Porterville residents—likely sped up and streamlined the process in this case, though it has still been a multi-year project.

Many consolidations have been successful without the State playing such central role, especially where the parties have brought their issues and concerns to the table and worked collaboratively to resolve them.

POTENTIAL SOLUTIONS FOR THE LENGTH AND COMPLEXITY OF THE CONSOLIDATION PROCESS

- Provide funding for legal services needed to navigate the consolidation process.
 - Explore ways to streamline the consolidation process and speed up funding agreements.
-

H. SCOPE AND USE OF MANDATORY CONSOLIDATION AUTHORITY

Participants noted that the State Water Resources Control Board has made relatively limited use of its mandatory consolidation authority so far. Some suggested that the scope of the Board's current authority is too limited to address many important situations that may benefit from consolidation; for example, providing water to schools. There seemed to be a near consensus that the Board should be more aggressive in using its mandatory consolidation power where there has been historic underinvestment or significant tension between the presumptive receiving system and the non-compliant system and voluntary consolidation is not occurring.

POTENTIAL SOLUTION FOR ADDRESSING THE SCOPE AND USE OF THE MANDATORY CONSOLIDATION AUTHORITY

- Expand the scope of the State Water Resources Control Board's mandatory consolidation power to include currently excluded systems and communities, such as schools.
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V. Looking Forward

The discussions encapsulated in this document suggest there is much to be learned from experience with small water system consolidations. These discussions can begin to inform current and future policy proposals, such as proposed legislation, that are intended to address barriers and provide new tools for consolidations.

Legislators have introduced multiple bills related to consolidation this session, but the proposals are not necessarily well-coordinated with one another, and they address a narrow subset of the relevant issues and concerns participants explored in the workshop. The potential solutions offered by participants can serve as a useful starting point for further policy discussions. **Table 1** suggests which types of entities might be well suited to help implement those solutions.

This project lays the groundwork for continuing constructive and inclusive dialogue among stakeholders and decision makers, as well as for a future research agenda that targets key information gaps.

Additional work can build on this initial effort by bringing together more strands of dialogue in a structured way that facilitates further learning and cross-pollination of ideas. Workshop participants emphasized that future conversations should include additional voices and perspectives that were not included in the workshop due to time and space constraints. These include community members who have been or will be affected by consolidations and representatives of various organizations, including public agencies (e.g., cities and counties that have experienced or are considering consolidations, city and county planners, LAFCOs, groundwater management agencies, additional special districts, and the Department of Water Resources), public and private entities involved with Integrated Regional Water Management, mutual water companies, the Association of California Water Agencies (ACWA), taxpayer groups, private sector industries (including the construction, agricultural, and chemical industries), and Chambers of Commerce.

Table 1: Summary of potential solutions participants offered for addressing barriers to effective consolidations, highlighting potential implementers (researchers, local entities, state agencies, and the state legislature)

BARRIERS	POTENTIAL SOLUTIONS	RESEARCHERS	LOCAL ENTITIES	STATE AGENCIES	LEGISLATURE
INFORMATION GAPS	Gather and organize existing data sets for private domestic wells (e.g., location, depth, water levels, and water quality).	○		○	
	Require periodic water quality testing of private domestic wells, targeting contaminants of local concern.			○	○
	Analyze the long-term costs and benefits of different types of consolidations to receiving systems, subsumed systems, cooperating systems, and the state (see Part IV.A for specifics).	○			
	Analyze how the degree of autonomy small water system users retain differs for different consolidation arrangements and structures.	○			

BARRIERS	POTENTIAL SOLUTIONS	RESEARCHERS	LOCAL ENTITIES	STATE AGENCIES	LEGISLATURE
CHANGING REGULATORY STANDARDS	Proactively roll out a targeted consolidation funding strategy as part of the implementation plan for new stringent drinking water standards.			○	○
WATER RATE & AFFORDABILITY ISSUES	Develop methods and metrics to represent the distribution of benefits and burdens of consolidation in a systematic and fair way.	○			
	Perform a comparative analysis of the financial authorities, constraints, opportunities, and incentives relevant to consolidation for each type of public or private water system ownership.	○			
	Explore the possibility of a legislative change to the statutory definitions applicable to Proposition 218 that would deem water rates not to have increased when higher charges are required to implement a public health and safety requirement.	○	○		○
	Consider affordability when selecting consolidation structures.		○	○	
	Ensure that receiving systems charge newly consolidated customers rates that reasonably reflect the costs of serving them, for example, by including a “social equity” clause in consolidation agreements that preserves community and public participation, prevents unregulated privatization, and establishes rate protections.		○	○	
	Phase in rate increases related to consolidation over time, rather than all at once.		○		
GRANT & LOAN ISSUES + STATE PREFERENCE FOR FULL CONSOLIDATION	Develop a proactive state plan to build capacity and target funding to solve drinking water problems in communities that have experienced historical underinvestment.			○	○
	Modify grant guidelines to include a clear definition of TMF capacity designed to support desired outcomes.			○	○
	Provide technical assistance funding for managerial consolidations.			○	○
	Pursue funding from sources less commonly used for consolidations, such as Federal Emergency Management Agency hazard mitigation funds or Integrated Regional Water Management funding.		○	○	
	Create sustained, state-level funding sources for addressing drinking water quality problems, such as taxes and fees on the use of common water pollutants like fertilizers and pesticides.				○
	Expand permanent low-interest loan programs, like the State Revolving Funds, to increase ongoing funding.				○

BARRIERS	POTENTIAL SOLUTIONS	RESEARCHERS	LOCAL ENTITIES	STATE AGENCIES	LEGISLATURE
GRANT & LOAN ISSUES (continued)	Authorize the State Water Resources Control Board to require regionalization of small, chronically out of compliance public water systems and to collect fees to support it.				○
	Analyze what factors affect the ability of different types and sizes of public and private entities to raise capital.	○			
DISTANCE	Expand UC Davis' study (which found that 66% of San Joaquin Valley disadvantaged communities were within 500 feet, and 85% were within 3 miles, of a compliant system) to the whole state.	○			
	Explore consolidation possibilities with a wider variety of IOUs and mutual water companies, which may provide opportunities for creative managerial consolidations and have access to different funding sources than water systems owned by public entities.		○	○	
RESISTANCE FROM SMALL SYSTEMS & THEIR RESIDENTS	Allow community members to petition the State Water Resources Control Board for consolidation with a compliant system.			○	○
	Provide community members with specific, relevant information about why consolidation may be helpful and why and how water rates would change after consolidation.	○	○	○	
	Ensure representation and/or involvement of subsumed communities (e.g., by maintaining the board of a subsumed water system as an advisory body, by adding representatives of the subsumed community to the board of the receiving system, etc.).		○		
RESISTANCE FROM RECEIVING SYSTEMS & THEIR RESIDENTS	Articulate the costs and benefits (e.g., increasing local water security, improving economies of scale, etc.) of consolidation to receiving systems.	○	○	○	
	Require cities and counties to create plans to ensure access to safe, affordable drinking water in their communities, and tie plan implementation to state funding incentives.			○	○
	Introduce additional liability protections for receiving systems in consolidations.				○
LENGTH & COMPLEXITY OF CONSOLIDATION PROCESS	Provide funding for legal services needed to navigate the consolidation process.				○
	Explore ways to streamline the consolidation process and speed up funding agreements.	○	○	○	○
SCOPE & USE OF MANDATORY CONSOLIDATION AUTHORITY	Expand the scope of the State Water Resources Control Board's mandatory consolidation power to include currently excluded systems and communities, such as schools.				○

Related Reading and Resources

California Senate Bill 88 (2014).

California Senate Bill 244 (2011).

LARRY LAI, LUSKIN CTR. FOR INNOVATION, ADOPTING COUNTY POLICIES WHICH LIMIT PUBLIC WATER SYSTEM SPRAWL AND PROMOTE SMALL SYSTEM CONSOLIDATION (2017), *available at* <http://innovation.luskin.ucla.edu/content/adopting-county-policies-which-limit-public-water-system-sprawl-and-promote-small-system-con>.

JONATHAN LONDON, AMANDA FENCL, SARA WATTERSON, JENNIFER JARIN, ALFONSO ARANDA, AARON KING, CAMILLE PANNU, PHOEBE SEATON, LAUREL FIRESTONE, MIA DAWSON & PETER NGUYEN, U.C. DAVIS CTR. FOR REG'L CHANGE, THE STRUGGLE FOR WATER JUSTICE IN CALIFORNIA'S SAN JOAQUIN VALLEY: A FOCUS ON DISADVANTAGED UNINCORPORATED COMMUNITIES (2018), *available at* <https://regionalchange.ucdavis.edu/publication/water-justice>.

Debra Martin, *Regionalization: A Potential Solution to Affordability and Capacity Issues of Small Systems*, RURAL MATTERS, Summer 2009, at 8, *available at* <https://rcap.org/wp-content/uploads/2016/01/RuralMatters-Summer2009-1.pdf>.

State Water Res. Control Bd., *Consolidation Statistics*, STATE WATER RES. CONTROL BD., https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/dashboard.html (last updated Feb. 13, 2018).

State Water Res. Control Bd., *Mandatory Consolidation or Extension of Service for Disadvantaged Communities*, STATE WATER RES. CONTROL BD., https://www.waterboards.ca.gov/drinking_water/programs/compliance/ (last updated Dec. 28, 2017).

STATE WATER RES. CONTROL BD., STATE OF CALIFORNIA CLEAN WATER STATE REVOLVING FUND AND THE WATER QUALITY, SUPPLY, AND INFRASTRUCTURE IMPROVEMENT ACT OF 2014 INTENDED USE PLAN: STATE FISCAL YEAR 2017–18 (June 20, 2017), *available at* http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/cwsrf_iup_sfy2017_18_final.pdf.

STATE WATER RES. CONTROL BD., STATE OF CALIFORNIA DRINKING WATER STATE REVOLVING FUND AND THE WATER QUALITY, SUPPLY, AND INFRASTRUCTURE IMPROVEMENT ACT OF 2014 INTENDED USE PLAN: STATE FISCAL YEAR 2017–18 (June 20, 2017), *available at* http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/dwsrf_iup_sfy2017_18_final.pdf.

State Water Res. Control Bd., *Frequently Asked Questions on Mandatory Consolidation or Extension of Service for Water Systems* (Nov. 7, 2016), *available at* https://www.waterboards.ca.gov/drinking_water/programs/compliance/docs/fs082415_mand_consolid_faq.pdf.

U.S. ENVTL. PROT. AGENCY, SYSTEM PARTNERSHIP SOLUTIONS TO IMPROVE PUBLIC HEALTH PROTECTION, vol. II (2006), *available at* <https://www.epa.gov/sites/production/files/2017-07/documents/p100399z.pdf>.

Endnotes

- 1 CAL. WATER CODE § 106.3.
- 2 The California Water Code defines a “disadvantaged community” as “a community with an annual median household income that is less than 80 percent of the statewide annual median household income.” CAL. WATER CODE § 79505.5(a); *see also* CAL. PUB. RES. CODE § 75005(g). A “disadvantaged unincorporated community” is “a fringe, island, or legacy community in which the median household income is 80 percent or less than the statewide median household income.” CAL. GOV’T CODE § 65302.10(a).
- 3 *See* State Water Res. Control Bd., Frequently Asked Questions on Mandatory Consolidation or Extension of Service for Water Systems, at 1 (last updated Nov. 7, 2016), *available at* https://www.waterboards.ca.gov/drinking_water/programs/compliance/docs/fs082415_mand_consolid_faqs.pdf.
- 4 There are a number of different statutory definitions for small water systems. For example, the federal Safe Drinking Water Act defines “small systems” as “public water systems serving 10,000 or fewer persons.” 42 U.S.C. § 300j-12(g)(2) (C). However, a “[s]tate small water system . . . serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year.” CAL. HEALTH & SAFETY CODE § 116275(n).
- 5 *See* Darrin Polhemus, State Water Res. Control Bd., Water Partnerships and Consolidation 5 (Aug. 17, 2017), *available at* https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/wpc_events/swrcb_drinking_water_and_financial_assistance_presentation.pdf (attributing 80% of California drinking water violations to very small systems that serve between 25 and 500 people, and less than 8% to systems serving between 25 and 3,300 people); State Water Res. Control Bd., Summary of Public Water System Exceedance / Compliance Status (Mar. 13, 2018), *available at* https://www.waterboards.ca.gov/water_issues/programs/hr2w/docs/data/hr2w_web_data_summary_20180313.xls (spreadsheet file).
- 6 State Water Res. Control Bd., Notice of Workshop and Notice of Opportunity for Public Comment, Joint Workshop of the California Public Utilities Commission and State Water Resources Control Board: Providing Safe Drinking Water Through Consolidation of Water Systems and SB 623, at 1 (Nov. 3, 2017), *available at* https://www.waterboards.ca.gov/board_info/calendar/docs/notice_joint_wrkshp_safe_dw_111317.pdf.
- 7 *See* JONATHAN LONDON, AMANDA FENCL, SARA WATTERSON, JENNIFER JARIN, ALFONSO ARANDA, AARON KING, CAMILLE PANNU, PHOEBE SEATON, LAUREL FIRESTONE, MIA DAWSON & PETER NGUYEN, U.C. DAVIS CTR. FOR REG’L CHANGE, THE STRUGGLE FOR WATER JUSTICE IN CALIFORNIA’S SAN JOAQUIN VALLEY: A FOCUS ON DISADVANTAGED UNINCORPORATED COMMUNITIES 13–14 (2018), *available at* <https://regionalchange.ucdavis.edu/publication/water-justice>.
- 8 *See* LARRY LAI, LUSKIN CTR. FOR INNOVATION, ADOPTING COUNTY POLICIES WHICH LIMIT PUBLIC WATER SYSTEM SPRAWL AND PROMOTE SMALL SYSTEM CONSOLIDATION 16–17, 17 tbl.3 (2017), *available at* <http://innovation.luskin.ucla.edu/content/adopting-county-policies-which-limit-public-water-system-sprawl-and-promote-small-system-con> (identifying 106 past or ongoing consolidation projects that have eliminated, or could potentially eliminate, 177 water systems).
- 9 Several participants noted that small water systems may not be able to afford the high cost of treatment needed to meet more rigorous drinking water standards. *See also* Maura Allaire, Haowei Wu & Upmanu Lall, *National Trends in Drinking Water Quality Violations*, 115 PROC. NAT’L ACAD. SCI. 2078, 2081, 2082 (2018), *available at* <http://dx.doi.org/10.1073/pnas.1719805115>.
- 10 *See* CAL. DEP’T WATER RES., CALIFORNIA WATER PLAN, UPDATE 2013, at 3-10, 3-58, 3-59 (2014), *available at* <https://www.water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Water-Plan-Updates/Files/Update-2013/Water-Plan-Update-2013-Volume-1.pdf>; *see also* Minxue He, Mitchel Russo & Michael Anderson, *Hydroclimatic Characteristics of the 2012–2015 California Drought from an Operational Perspective*, CLIMATE, Mar. 2017, art. 5, at 17, *available at* <https://doi.org/10.3390/cli5010005>; Henry Fountain, *In a Warming California, a Future of More Fire*, N.Y. TIMES, Dec. 7, 2017, *available at* <https://www.nytimes.com/2017/12/07/climate/california-fires-warming.html>.
- 11 *See* California Assembly Bill 2050, Small System Water Authority Act of 2018 (Caballero); California Assembly Bill 2339, Water utility service: sale of water utility property by a city (Gipson); California Assembly Bill 2501, Drinking water: consolidation and extension of service (Chu); California Senate Bill 1215, Drinking water systems and sewer systems: consolidation and extension of service (Hertzberg).
- 12 Note that the workshop did not analyze specific proposals, and it is not the purpose of this document to address them directly.

About the Authors

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About CLEE

The Wheeler Water Institute develops interdisciplinary solutions to ensure clean water for California. Established in 2012 at the Center for Law, Energy & the Environment (CLEE) at Berkeley Law, the Institute conducts projects at the intersection of law, policy, and science.

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