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Dear California State Water Resources Control Board,

The Sequoia Foundation, in collaboration with partners from California Department of Public Health, assessed the Water Board's strategy to promote consolidation of water systems in California. All water policies have important connections to public health; this letter outlines how consolidation of water systems may influence health, and we offer recommendations to maximize health and equity. The assessment focused on health determinants (conditions and factors that influence health) and health outcomes that are influenced by consolidation policies described in the 2016/17 Drinking Water Revolving Fund Intended Use Plan. Specifically, the assessment examined health impacts relating to access to clean, contaminant-free, reliable, and affordable drinking water. We also explored how changes to household water costs might affect health and mental health, as well as opportunities to address equity, such as drinking water access in vulnerable and low-income communities.

Early in the assessment, we met with staff from the State Water Resource Control Board to discuss the Intended Use Plan and to identify policies within the plan that could benefit from consideration of public health impacts. Public health impacts include direct health impacts, such as water contaminants and health, as well as the many indirect ways that water access can affect other determinants of health, such as household finances and mental health related to costs and water security. Water Board (WB) staff explained some of the technical details related to the consolidation of community water systems, including financing options and the provision of infrastructure needs.

The assessment included: 1) data gathered from WB staff, 2) a thorough literature review, and 3) stakeholder interviews to determine priorities, understand existing conditions and the impacts of the updated plan, and to develop recommendations. Two interviewees work in the area of water rights and advocacy, and two are researchers studying the public health impacts of California's drought. Our findings and recommendations for implementation of the plan are described here.

We fully support the Board's policy to provide finance options that promote voluntary consolidation by allowing large community water systems to be eligible for financing offered to smaller systems (<14 service connections and 25 people) included in the consolidation.

Rationale

The stakeholders we spoke to and much of the available literature supports consolidation of systems to help small public water systems that struggle to

maintain a steady supply of drinking water that meets Federal and State standards. In California, approximately two percent of public water systems (how many systems), primarily in rural areas, do not reliably deliver drinking water that meets all state and federal drinking water standards. Violations can include contaminants in excess of the allowable amounts such as nitrates and arsenic, as well as presence of coliforms. Through the consolidation of water systems and service extensions, the number of systems relying on contaminated water sources, unreliable or inadequate sources of supply, or having no water at all will be reduced or eliminated.[1]

Consolidation of water systems is a strategy being promoted in California and in states throughout the country.[2] The US EPA defines small water systems as those serving less than 1,000 people. Small water systems face technical, managerial and financial challenges. Specifically, they have more water quality violations than their larger counterparts and they are more likely to fail to properly monitor for contaminants like coliform and nitrates, make timely repairs, or replace faulty materials.[3] Very small water systems—those serving 25-500 individuals—experience the most violations per 1,000 people served compared to larger systems.[4] Larger systems are often able to provide reliable and safe drinking water because they have diverse water sources, are able to blend these sources, and have the capacity to regularly monitor their systems. When they consolidate with a smaller system, in particular those that are not meeting minimum safety requirements, they are responsible for bringing the smaller system into compliance. The larger systems also have infrastructure costs associated with consolidation. Financing and loan options described in the Intended Use Plan for the Drinking Water Revolving Fund are more favorable for smaller systems compared to large systems because they often serve disadvantaged communities. However, in support of voluntary consolidation, the plan also states that larger water systems consolidating with smaller systems will be eligible for financing offered to the smallest system in the consolidation agreement. This eligibility inclusion creates an incentive for larger systems to consolidate and mitigate water quality violations. The financing will support infrastructure costs associated with consolidation.

Health Impacts

If consolidation can successfully reduce water quality violations, more common among smaller systems, it will increase access to safe and clean water for California residents. Greater financing options will allow large systems to maintain clean water for existing customers while providing improved water to previous customers of the consolidated small water systems. The potential health impacts are broad and varied.

Exposure to coliforms (bacteria) can cause mild to severe gastrointestinal distress.[5] A 2006 study found that between 4.26 and 11.69 million cases of acute gastrointestinal disease are attributable to public drinking water systems each year in the United States.[6]

Water contaminants can also lead to dermatological disease, and some chemical contaminants are carcinogens and endocrine disruptors. Two common

contaminants are nitrates and arsenic. Nitrates cause methemoglobinemia, which threatens oxygen-carrying capacity of the blood in infants. Nitrates are more commonly found in small water systems and those serving Latinos and renters in California.[7] Arsenic causes acute and chronic toxicity, liver and kidney damage, decreases blood hemoglobin, and is a carcinogen.[8]

Mental health is another important consideration. Residents, who participated in a recent Community Assessment of Public Health Emergency Response (CASPER) conducted by the California Department of Public Health in partnership with Tulare and Mariposa county health departments, indicated that the drought impacted their household finances, health, and peace of mind. Some of the mental health impacts may be due to job insecurity associated with drought in agricultural communities, and interviewees also described stress being a concern due to insufficient access to safe water. While not all of these outcomes are directly related to consolidation of water systems, they indicate the public health impacts that insufficient or poor quality water and water insecurity can have on a community. [9,10]

We offer the following recommendations to enhance potential health benefits and reduce risks for harm from consolidation.

Recommendation 1:

Provide technical assistance to water systems staff undergoing consolidation on implementing pricing structures that promote equity. Consider strategies to implement efficiency-based rates, to promote equity and conservation within the first two years of consolidation.

Rationale

One of the primary benefits of consolidation is to create economies of scale in operational costs. Operational costs to maintain the water system become centralized and spread over a larger number of customers. For some residents, this can result in a decrease in water costs, while others, especially those who had private wells that failed, may experience an increase in household water costs. Specifically, residents that previously accessed water from private wells, but are now going to be part of a public water system because their wells failed, will receive a monthly water bill for the first time. Although, these costs may be lower than water hauling, using bottled water, or traveling distances to use water for showering and other needs. As drinking water system infrastructure needs continue to grow due to outdated infrastructure, water rates will increase, creating a hardship for many households, especially low-income residents.[11] Increasing water rates are a concern not just in California, but also throughout the country. Between 2010 and 2014, average drinking water bills in the U.S. rose 33 percent.[12] A 2014 study finds that water bills in California's urban areas increased two to three times faster than inflation between 2000 and 2010 to cover infrastructure and other system costs.[13] Water rates are expected to continue to grow above inflation into the foreseeable future.[14] This is especially concerning for low-income residents, who in some areas of the state, are spending more than 4.5% of their household income on

water.[15] Therefore, as water systems expand, developing fair and equitable pricing structures are critical.

The most equitable pricing structure is efficiency-based or conservation-based water rates. In this model, water systems determine a water budget for each customer account based upon reasonable needs and efficient use. This takes into account household size and irrigation needs based on parcel size. There is a lower rate for budgeted water units, and water units used beyond the budgeted amount is charged a higher per unit rate.[16] This structure is most equitable to low income households because it sets an affordable rate for basic water needs (hygiene, food safety, hydration) and promotes conservation. Unlike fixed pricing water rates, efficiency-based rates reward conservation. Lower income households already typically use far less water than high-income households.[17] Therefore, low-income residents are likely to save money with efficiency-based rates. This is especially true in communities that also help low-income residents with the purchase of water-efficient upgrades such as high-efficiency toilets. In traditional flat pricing structures, households that conserve are charged the same amount for water as those that use an excess of water. Interviewed stakeholders reported that while efficiency-based pricing requires some upfront research and planning, it has proven to be a cost-effective strategy to conserve water and lower costs in places where it has been implemented. Water systems using efficiency-based pricing have not seen loses in revenue. This pricing structure has not been broadly adapted despite its success. This may be due to lack of knowledge about the system, or barriers to conducting the research needed in order to set household pricing in accordance with Proposition 218. In 2015, the California Supreme Court ruled against San Juan Capistrano for setting tiered pricing because the city was not able to demonstrate that water rates were consistent with costs, a requirement of Proposition 218.[18] While this lawsuit has created concern around tiered pricing, it is legal as long as rates are set in accordance with actual costs of services. For this reason, technical support from the Water Board staff or consultants could facilitate this practice.

Tiered pricing is the second most equitable pricing structure and is a good alternative in situations where efficiency-based pricing is unachievable, or while data are being gathered to implement efficiency-based pricing. Tiered pricing is similar to efficiency pricing in that rates change based on water usage, but the unit rates are not based on household size. It is less equitable than efficiency-based pricing, but still more equitable than flat-rate pricing.

Health Impacts

Basic household costs—including residential water costs—are important health determinants, with marked impacts on low-income households. In some very low-income households (< $10,000 income), water costs may be as much as 20% of annual income.[19] A survey from the California Public Utilities Commission found that 56% of low-income households cut back on basic household necessities to cover their utility bills.[20] When water rates increase, there may be changes in

household spending. This change in household expenses can impact health if the cost creates physical and emotional stress on payers, or result in reduced spending on healthcare, medication or healthy foods. For example, we know that low-income households on tight budgets are already more likely to purchase higher calorie foods with limited nutritional value.[21] This is why strategies to make water for basic needs affordable are critical. Some stakeholders shared concerns that households with water affordability issues may replace drinking water with sugary beverages, a known risk factor for obesity and related illnesses like diabetes.[22] Lastly, efficiency-based water rates may help promote water conservation and more efficient water use. Conservation will help increase water accessibility for drought stricken areas, and prevent the health and mental health impacts associated with drought.[23]

Recommendation 2:

Assist water systems in the development of communication strategies that keep community members well informed about consolidation efforts, the impacts on water costs, and water quality. This should be done before, during, and after systems are consolidated.

Rationale

Water accessibility, safety, sourcing, and pricing are important issues to consumers. For people moving from private wells, or small locally managed water systems to consolidation, concerns about these issues are likely to arise. Without adequate information, customers may not trust their new water system, resulting in water safety fears. Both large and small water systems managers involved in a merger should keep residents well informed about why the systems are consolidating, the benefits and potential harms expected, and the infrastructure costs needed to make it a success. System managers should also make rate structures transparent, and provide education about conservation strategies. In his 2011 article, "The Price of Water: A Comparison of Water Rates, Usage in 30 U.S. Cities," Brett Walton described communication between utilities and customers as a barrier to better water management. For example, customers may not know how rigorous water testing is, nor may they understand the technical aspects of sustaining a water system.[24] Accessible, frequent communication can be helpful in building trust between water systems and their customers.

Water systems should consider using a variety of communication strategies to reach California's most vulnerable populations who may have limited accessibility to clean and safe water and more immediate concerns about affordability. Written communications should be appropriate for low literacy audiences and available in multiple languages based on the community served. Water safety reports should be presented in an easy to use format.[25] In addition, water systems could consider using online resources, social media, and in-person community meetings to reach the widest audience possible.

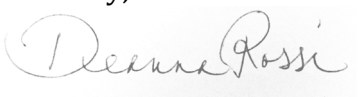
Health Impacts

Residents may experience improved health outcomes when they feel assured that their water system delivers safe, clean, and affordable water. For example, if residents perceive concern about the safety of their drinking water, they might replace tap water with bottled water, or choose food and drink options that are less healthy. When asked if they use tap water for cooking and drinking, 31% of interviewed residents in Tulare County reported they do not. The bottled water industry's marketing has taken advantage of consumer fears about tap water.[26] While safety requirements for bottled water have improved in recent years, bottle water is costly and can create a financial burden on low-income households. A 2011 study found that more than 20% of both Latino and African American parents use only bottled water compared with less than 10% of non-Latino white parents. African Americans and Latinos spent a higher percent of their household income on water compared to whites. Overall, 10.5% reported that they had to give up other things in order to purchase bottled water.[27] Water systems should communicate water quality testing results and educate consumers about filtering options if they have concerns around water taste.

Furthermore, if residents have a better understanding of efficiency-based or tiered pricing, they may have a greater sense of control over their water costs. If they understand the benefits of conservation, they will likely identify new strategies to conserve water, beyond basic needs, to keep their costs as low as possible. stakeholders raised this need for improved and regular communication between water systems and their customers. There are numerous online resources the Water Board can use to assist water systems develop messages and prepare educational materials for consumers.[28, 29]

In closing, we fully support the strategy outlined in the 2016 Drinking Water Intended Use Plan that encourages and incentivizes voluntary consolidation. Implementation of the recommendations outlined in this letter will further benefit the health of consumers in consolidated water systems by making water safe and affordable, especially for low-income communities. Please consider these recommendations to promote health through consolidation of water systems.

Sincerely,



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