

ATTACHMENT C2: KERN COUNTY CASE STUDY

Attachment to the State Water Resources Control Board 2021 Drinking Water Needs Assessment Cost Assessment Methodology Appendix C

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2021_needs_assessment.pdf

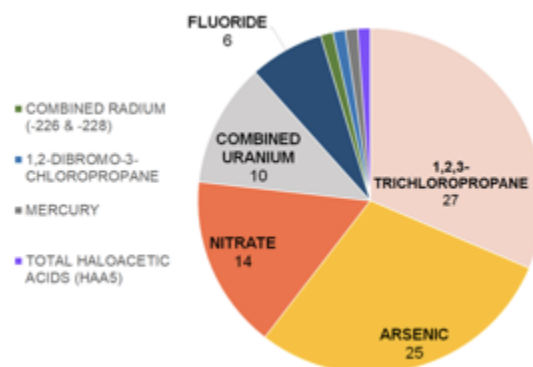
BACKGROUND

In order to estimate the cost of providing modeled solutions to HR2W list systems and At-Risk systems, the Cost Assessment Model needs to identify the challenges and issues, beyond water quality, that these systems are struggling with in order to provide safe and reliable drinking water. Due to the timing of this project, the Risk Assessment risk indicators were still under development and could not be utilized to determine possible challenges. Therefore, Corona Environmental conducted a case study of the HR2W list systems in Kern County to identify and refine the possible challenges the Cost Assessment Model may need to address. Kern County was selected for initial analysis because it has 61 of the state's 311 HR2W list systems.

WATER QUALITY VIOLATIONS

Figure C2.1 summarizes the different water quality violations in Kern County.

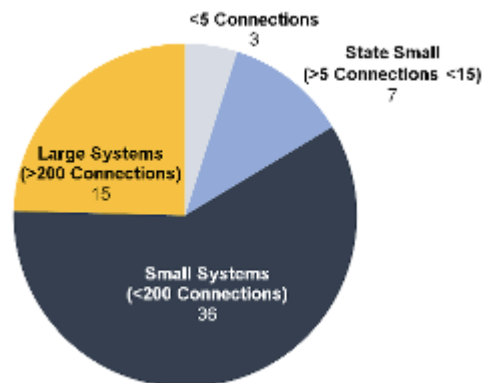
Figure C2.1: Kern County HR2W Systems Water Quality Violations



1,2,3-Trichloropropane (TCP) violations are the most numerous in Kern County. This is a fairly new regulation, which became effective in December of 2017¹, and California's Central Valley is heavily impacted by TCP groundwater contamination. Although the federal arsenic MCL was announced in 2001² and became effective in 2006, there are still 25 systems in Kern County that have not been able to come into compliance.

One of the common factors shared by HR2W list systems is small system size. Smaller systems often have fewer technical, managerial, and financial resources to leverage. The size distribution of the Kern County HR2W list systems is shown in Figure C2.2 with 75% of systems serving fewer than 200 connections.

Figure C2.2: Kern County HR2W Systems by Number of Service Connections



IDENTIFYING OTHER ESSENTIAL INFRASTRUCTURE NEEDS

In addition to the water quality challenges, these systems also often face other infrastructure issues. To examine these challenges in a more quantitative way, the sanitary surveys³ for 60 of the HR2W systems in Kern County were analyzed to look at source age, source capacity, and storage capacity. This detailed analysis will not be performed for systems in other counties, but this data will be used to inform the overall cost analysis statewide.

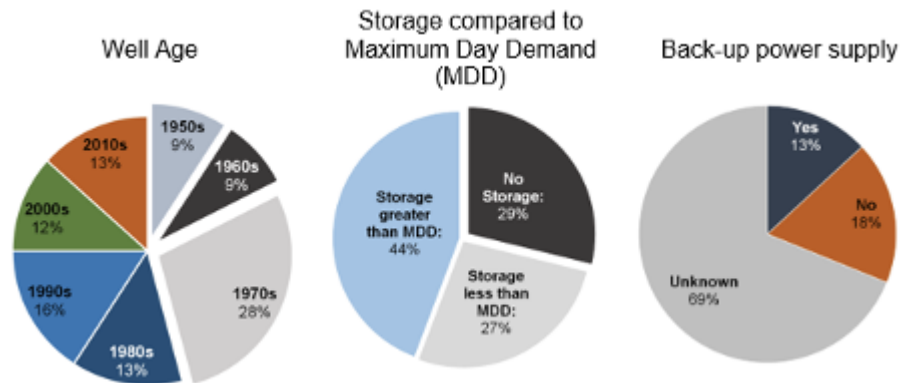
¹ State Water Board, 2017. [Information Pertaining to this Regulatory Proposal](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/SBDDW-17-001_123TCP_MCL.html).
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/SBDDW-17-001_123TCP_MCL.html

² U.S. EPA, 2001. [Technical Fact Sheet: Final Rule for Arsenic in Drinking Water](https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockkey=20001XXE.txt).
<https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockkey=20001XXE.txt>

³ The most recent Sanitary Surveys for Kern County HR2W list systems were provided by the State Water Board in PDF format.

Nearly half (48%) of these systems only have one water source, which would not be allowed in a newly constructed water system.⁴ Figures C2.3 and C2.4 summarize the proportion of systems that may have additional infrastructure needs.

Figure C2.3: Additional Issues Identified – Well Age, Storage, & Back-Up Power



Although regularly maintained wells can have a life span much longer than 40 years, in HR2W list systems and At-Risk systems the maintenance can be less consistent. Therefore, wells older than 40 years are assumed to need replacement due to age, which is 46% of the Kern County HR2W list system's wells in this data set. Wells in the age range of 20 to 40 years old, which is 29% of the wells, are assumed to need a new pump and motor and electrical upgrades.

A more system specific analysis would be required to understand how many of these systems meet the storage requirements outlined in the regulations,⁵ however it is worth noting that only 44% of the systems clearly have enough storage to meet MDD. This leads to the assumption that 56% of systems need additional storage.

In the case of back-up power supply 69% of Kern County HR2W list systems were reported to have an unknown status. This analysis also suggests that 58% of the Kern County HR2W list systems need back-up power.

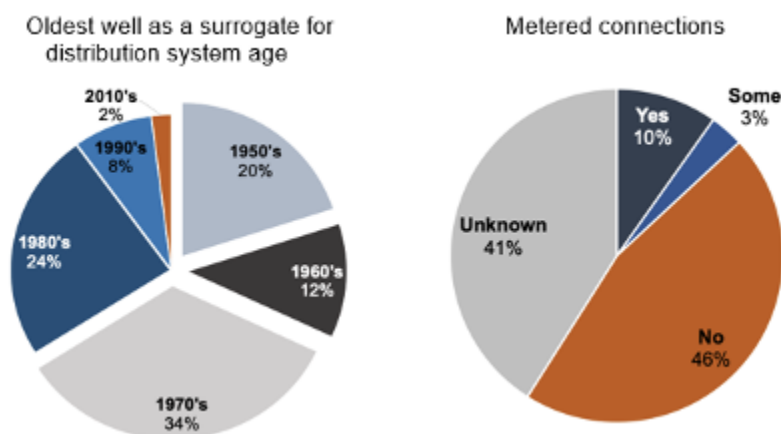
⁴[Title 22 Code of Regulations, 2019. Section 64554, \(c\)](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dw_regulations_2019_04_16.pdf)

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dw_regulations_2019_04_16.pdf

⁵[Title 22 Code of Regulations, 2019. Section 64554, \(a\) \(2\)](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dw_regulations_2019_04_16.pdf)

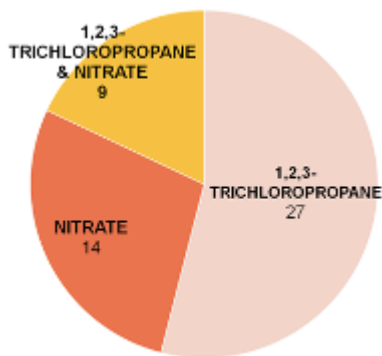
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Figure C2.4: Additional Issues Identified – Distribution System Age and Meters



Unfortunately, information on the age of the distribution system is not available. The age of the oldest well in a system has been used as a surrogate. As can be seen in Figure C2.4, 66% of the oldest wells are 40-years old or more. This analysis assumed that 66% of the Kern County HR2W list systems need distribution system main replacement based on age. When a water source has co-occurring contaminants (e.g. more than a single contaminant) that require treatment, the cost to treat the water can increase dramatically. In Kern County, the most common example of co-occurring contaminants requiring treatment includes both nitrate and TCP at levels over the MCL, as shown in Figure C2.5. Another group of systems to consider are those with co-occurring contaminants that are not yet over the MCL, but impact treatment decisions.

Figure C2.5: Co-occurring Contamination of Wells with Nitrate and TCP in Kern County HR2W List Systems



The following list of additional other essential infrastructure (OEI) needs was developed based on this Kern County case study analysis and refined based on public feedback. The Cost Assessment Model applies the percentages detailed in Table C2.1 to all HR2W list systems and At-Risk PWSs.

Table C2.1: Changes in OEI Needs for HR2W List and At-Risk PWSs

Infrastructure	Kern County Case Study Analysis	Cost Assessment Model Assumptions
Add a second well	All systems with one well	80% with one well
Replace well due to age	46%	26%
Replace well pump and motor	29%	9%
Upgrade electrical	29%	9%
Additional storage	56%	36%
Add back-up power	58%	38%
Replace distribution system	66%	31%
Add meters	82%	31%
Managerial assistance	All systems	80%
Land acquisition for additional storage	56%	10%
Land acquisition for adding a second well	All systems with second well	5%