



SB 552

Drought and Water Shortage Risk Analysis and Response Plan

for
Madera County

October 2024 Final Draft

Prepared by



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Attachment B: Contact List of Madera County Drought Workgroup Stakeholders
Attachment C: Madera County Drought Workgroup Meetings

1 Introduction and Background

This Madera County Drought and Water Shortage Response Plan (“Drought Plan”) has been developed to satisfy the requirements of Senate Bill 552 (Drought Planning for Small Water Suppliers and Rural Communities, SB 552) and to prepare the County of Madera (“County”) for future droughts and water shortages. This Drought Plan improves the County’s preparedness for and resiliency to drought in a number of key ways. First, the Plan explores the risk of water shortage for the County’s self-supplied communities, including analysis of State data and local stakeholder feedback. Second, opportunities to improve reliability through water system consolidation are considered. Third, an Action Plan is provided, including the monitoring protocols the County will use to detect water shortages, and interim and long-term solutions for state small water systems and domestic wells within the County. Lastly, the Drought Plan concludes with recommendations for additional policies and actions which can further improve the County’s preparedness for droughts and water shortages.

Overall, this Drought Plan allows the County to anticipate water shortages before they occur and respond proactively, reducing the risk of drought impacts throughout the County.

1.1 LEGAL BASIS

In response to the historic drought California experienced from 2012-2016, the State Legislature implemented a series of initiatives designed to improve the drought planning and response processes for water providers. Critically, small water suppliers and rural communities were identified as being particularly vulnerable to water shortages during droughts because they “vary widely in supply source reliability and organizational capacity”.¹ Beginning in 2018, the Department of Water Resources (DWR) organized a County Drought Advisory Group (CDAG) to identify small water suppliers and rural communities that are vulnerable to drought and water shortage and developed recommendations for how to improve drought preparedness through water shortage contingency planning.² DWR submitted a recommendation report, *Small Water Systems and Rural Communities Drought and Water Shortage Contingency Planning and Risk Assessment*,³ to the Legislature and Governor Newsom in Spring 2021. DWR’s recommendations became the basis of SB 552.

SB 552 amends California Water Code §10609.70 to include new drought planning requirements for counties, which this Drought Plan fulfills. The requirements are as follows:⁴

- a) Establish a standing county drought and water shortage task force or alternative process that facilitates drought and water shortage preparedness for state small water systems and domestic wells.
- b) Assess potential drought and water shortage risk.

¹ Department of Water Resources, & State Water Resource Control Board, Primer of Senate Bill 552: Drought Planning for Small Water Suppliers and Rural Communities (2022).

² Department of Water Resources (2022).

³ Department of Water Resources. (2022). Countywide Drought and Water Shortage Contingency Plans. Retrieved from <https://water.ca.gov/Programs/Water-Use-And-Efficiency/2018-Water-Conservation-Legislation/County-Drought-Planning>

⁴ California Water Code §10609.70

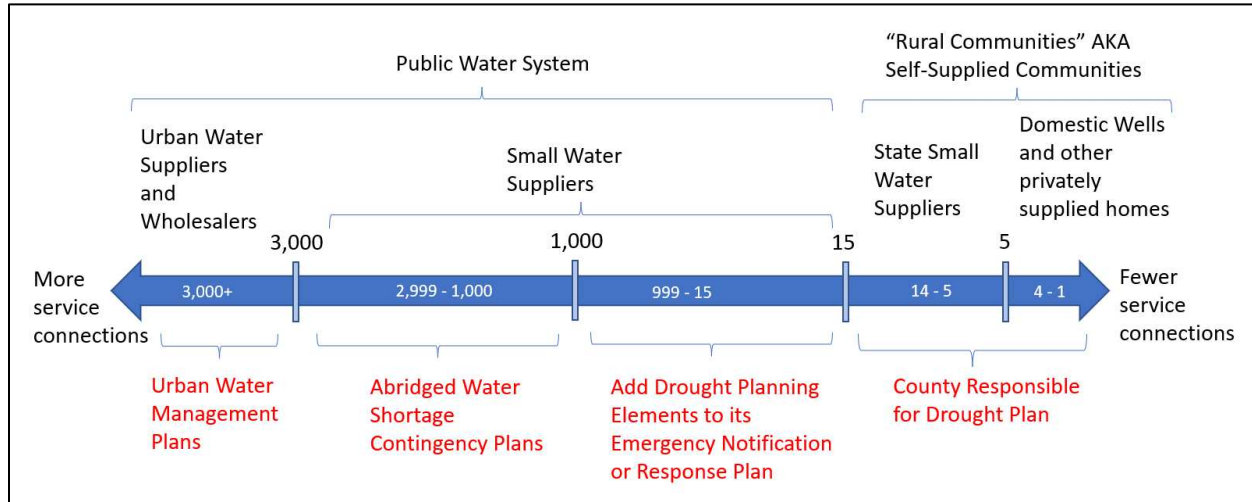
- c) Provide emergency and interim drinking water solutions in the county drought and water shortage risk mitigation plan (plan).
- d) Consider consolidations for existing water systems and domestic wells in the plan.
- e) Consider domestic well drinking water mitigation programs in the plan.
- f) Consider an analysis of steps to implement the plan.
- g) Consider an analysis of local, state, and federal funding sources available to implement the plan.

Madera County has already established a Drought Workgroup (see Attachment A), which satisfies the requirement for a “a standing county drought and water shortage task force or alternative process.”⁵ Drought preparedness and response actions are coordinated on an ongoing basis through meetings of the County’s Drought Workgroup; meetings often include guest speaker presentations and discussion of drought tools in the Central Valley. Between 2021 and 2023, the Drought Workgroup held meetings on a monthly basis due to ongoing drought conditions and shifted to a quarterly meeting schedule beginning in late 2023 as drought conditions subsided. The Drought Workgroup has regularly evaluated, and will continue to assess, the need for more frequent meetings in response to drought conditions and associated declarations made by the Madera County Board of Supervisors or the Governor’s Office. A list of the stakeholders in the Drought Workgroup is included as Attachment B. The remaining requirements of SB 552 are satisfied by this Drought Plan.

The focus of the Drought Plan is on the County’s smallest water systems – those with 14 or fewer connections and domestic wells. While other larger water systems also face drought related risks, the Legislature has assigned water systems with 15 or more service connections the responsibility for completing their own drought planning efforts. In contrast, water systems with 14 or fewer connections and domestic wells owners often lack the organizational capacity to complete their own drought plans. The responsibility of drought planning for water suppliers of different sizes is illustrated in Figure 1-1. As shown on the right-hand side of the figure, SB 552 assigns the County responsibility to complete a Drought Plan for these smallest systems and domestic wells (also called Self-Supplied Communities or Rural Communities).

⁵ California Water Code §10609.70 (a)

Figure 1-1: Drought Planning Responsibility by Number of Service Connections



Human Right to Water

California is one of the first states in the nation to legislatively recognize the human right to water. Through the passage of AB 685 and the subsequent amendment to Section 106.3 of the Water Code, “every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.”⁶ Importantly, the human right to water extends to all communities, including rural and disadvantaged individuals. Implementation requires sustained engagement at the regional and state level. The SWRCB is making efforts to implement outreach programs and improve access to technical assistance providers which is fundamental to ensure the human right to water for all Californians. Many of the programs and actions documented in this Drought Plan also advance the State’s goal of protecting the human right to water.

1.2 DROUGHT PLANNING EFFORTS IN MADERA COUNTY

In Madera County, several local agencies play a role in facilitating drought preparedness. These agencies include the Water and Natural Resources Department, the Sheriff’s Office of Emergency Services (Sheriff’s OES), the Madera County Flood Control and Water Conservation Agency, the Madera Valley Water Company, and various Groundwater Sustainability Agencies (GSAs) formed under the Sustainable Groundwater Management Act (SGMA).⁷

⁶ State Water Resources Control Board. (2022). Human Right to Water Portal. https://www.waterboards.ca.gov/water_issues/programs/hr2w/

⁷ The County is the exclusive GSA for the portion of the Madera Subbasin and Chowchilla Subbasin in the undistricted land of the County. There are additional GSAs within the Madera Subbasin, including the Madera County GSA, City of Madera GSA, Madera Irrigation District, Root Creek Water District, Madera Water District, Gravelly Ford Water District, and New Stone Water District. Other GSAs in the Chowchilla Basin include Chowchilla Water District, Triangle T Water District and Merced County.

The following GSAs are located in Madera County subbasins:

- City of Madera GSA
- Madera County GSA (Chowchilla, Delta-Mendota, and Madera Subbasins)
- Madera Irrigation District GSA
- San Joaquin River Exchange Contractors Water Authority GSA
- Aliso Water District GSA
- Chowchilla Water District GSA
- Gravelly Ford Water District GSA
- Madera Water District GSA
- New Stone Water District GSA
- Root Creek Water District GSA
- Triangle T Water District GSA

Other County agencies, such as the Community & Economic Development Department and the Environmental Health Division (EHD), as well as a number of community-based organizations, have also played a key role in the County’s drought response. Starting during the historic 2012-2016 drought, Community Action Partnership of Madera County⁸ and Self-Help Enterprises⁹ continue to provide financial and emergency services to residents throughout the County.

While Madera County has elected to prepare this Drought Plan as a stand-alone document, there are substantial opportunities for synergy with other County planning documents and efforts. This Drought Plan advances goals of the County’s 2017 Local Hazard Mitigation Plan (LHMP),¹⁰ such as reducing “drought/water shortage risk and vulnerability in Madera County” and developing “a comprehensive, countywide water plan to provide for existing development, to foster preservation of economic base, and to guide future development opportunities.” The conclusions of this Drought Plan can also help guide future planning efforts, such as Groundwater Sustainability Plan (GSP) updates, LHMP updates, Integrated Regional Water Management Plan (IRWMP), and General Plan Updates.

⁸ <https://maderacap.org/>

⁹ <https://www.selfhelpenterprises.org/>

¹⁰ Madera County, & Foster Morrison, Madera County Local Hazard Mitigation Plan Update (2017).

1.3 STAKEHOLDER ENGAGEMENT

Stakeholder engagement during the development of this Drought Plan was conducted primarily through the Madera County Drought Workgroup¹¹, which includes major stakeholder organizations involved in drought-related issues in the County. During 2022 and 2023, presentations on the development of the SB 552 plan were given during the monthly recurring Drought Workgroup Meetings, as listed in Attachment C. Meetings of the Drought Workgroup continued on a monthly basis until late 2023 and shifted to quarterly in 2024 with topics centering on drought preparedness and resiliency. In addition, member organizations of the Drought Workgroup were encouraged to distribute meeting invitations and engagement materials with their membership (contact lists).

1.4 PLAN ORGANIZATION

The remainder of this Drought Plan is organized into the following sections:

Section 2 – Identification of Drought and Water Shortage Risk

Section 3 – Small System Consolidation Opportunities

Section 4 – Shortage Response Actions (Action Plan)

Section 5 – Conclusions and Recommendations

Definitions

Consistent with the definitions presented in DWR guidance literature and the California Water Code, terms used in this Drought Plan have the following meanings:

- Community Water System – A public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents of the area served by the system, as defined in Section 116275 of the Health and Safety Code (Water Code §10609.51 subd. (a)).
- Domestic well – A groundwater well used to supply water for the domestic needs of an individual residence or a water system that is not a public water system and that has no more than four service connections, as defined in Section 116681 of the Health and Safety Code (Water Code §10609.51 subd. (k)).
- Drought Risk Explorer – A map-based webtool developed by the Department of Water Resources to support drought resilience planning among rural communities.¹²
- Non-community non-transient water system – A public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year,

¹¹ Madera County established its Drought Workgroup in 2021, as required by California Water Code §10609.70 (a), which meets on a regular basis to coordinate on drought preparedness and response actions.

¹² Retrieved from:

https://tableau.cnra.ca.gov/t/DWR_IntegratedDataAnalysisBranch/views/DWRDroughtRiskExplorer-RuralCommunitiesMarch2021/Dashboard?%3AshowAppBanner=false&%3Adisplay_count=n&%3AshowVizHome=n&%3Aorigin=viz_share_link&%3AisGuestRedirectFromVizportal=y&%3Aembed=y

as defined in Section 116275 subd. (k) of the Health and Safety Code. An example of this includes a school (Water Code §10609.51 subd. (g)).

- **Public Water System** – A system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily for at least 60 days out of the year (Health and Safety Code §116275 subd. (h).)
- **Rural community** – A community with fewer than 15 service connections or regularly serving less than 25 individuals daily at least 60 days out of the year, including domestic wells (Water Code §10609.51 subd. (j)). In other words, rural community in this law covers all water systems or domestic wells for human consumption that are not a public water system.
- **Self-supplied community** – A community with fewer than 15 service connections. For the purposes of this Drought Plan, a self-supplied community has the same definition as a rural community.
- **Small Water System** – A community water system serving 15 to 2,999 service connections, inclusive, and that provides less than 3,000 acre-feet of water annually (Water Code §10609.51 subd. (k)).
- **State Small Water System** – A system for the provision of piped water to the public for human consumption that 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 as defined in Section 116275 (n) of the Health and Safety Code (Water Code §10609.51 subd. (m)). These systems are sometimes referred to as “State Smalls”.
- **Sustainable Groundwater Management Act** – A three-bill legislative package, passed in 2014, set forth a statewide framework to help protect groundwater resources over the long-term. Groundwater Sustainability Agencies (GSAs) are responsible for adopting Groundwater Sustainability Plans (GSPs) to avoid undesirable results and mitigate overdraft within 20 years.
- **Urban Water Supplier** – A supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers.

2 Identification of Drought and Water Shortage Risk for Self-Supplied Communities

In order for Madera County to prepare for droughts and water shortages effectively and proactively before they occur, it is crucial to evaluate which communities are most at risk and what factors contribute to that risk. The County's risk evaluation focuses specifically on Self-Supplied Communities,¹³ which consist of State Small Water Systems (14-5 service connections) and domestic wells and other privately supplied homes (4 or fewer connections). The Legislature has found that these Self-Supplied Communities are the most likely to rely on shallow domestic wells, the most susceptible to well failure when droughts occur or groundwater levels drop from consistent over pumping, and the least likely to have access to alternative water supplies.

The Department of Water Resources (DWR), through a collaboration with other State agencies and stakeholders,¹⁴ developed the Drought and Water Shortage Risk Explorer Tool for Self-Supplied Communities (Risk Explorer Tool) to assist counties in performing risk assessments. DWR also administers California's Groundwater Live (GWLIVE) web interface which provides additional information about current groundwater conditions and domestic well infrastructure. In addition, the SWRCB's Division of Drinking Water, Division of Financial Assistance, and Office of Public Participation work together to implement the Safe and Affordable Funding for Equity and Resilience (SAFER) program. The SAFER Mapping Tool illustrates the current failing Human Right to Water systems and the results of the Risk Assessment for state small water systems.

This section of the County's Drought Plan reviews the results of three tools (Risk Explorer Tool, GWLIVE, and SAFER), including a county-wide risk evaluation. The factors most predictive of future water shortage are considered. *Section 2* concludes with a discussion of the limitations of the tools and recommendations for incorporating the tools findings into the response action framework described in *Section 4* of this plan.

2.1 MADERA COUNTY HYDROLOGY

Madera County is located entirely within the San Joaquin River Watershed, which drains via the San Joaquin Valley to the San Francisco Bay/Sacramento–San Joaquin Delta (Bay-Delta). The geography of the County is dominated by the Sierra Nevada Mountains and Foothills in the east of the County and the flat, fertile farmland of the Central Valley in the western portion of the County. The vast majority of the County's population resides in the largely agricultural communities on the Valley floor or in the western foothills of the Sierra Nevada.

Supply of water resources in Madera County comes from three major sources, including groundwater, local streams and rivers, and imported surface water. Of these sources, groundwater is by far the most important source for Self-Supplied Communities, with a few communities also relying on direct surface water diversions from local streams.

¹³ Water Code §10609.51 defines a "Rural Community" as "a community with fewer than 15 service connections, or regularly serving less than 25 individuals daily at least 60 days out of the year." This Plan uses

¹⁴ County Drought Advisory Group (CDAG), the State Water Board, and the Office of Environmental Health Hazard Assessment

In the Valley floor portion of the County, large alluvial aquifers have historically yielded significant quantities of groundwater for agriculture, urban, and domestic uses. The County overlies all or portions of the Madera, Delta-Mendota, and Chowchilla Subbasins of the San Joaquin Valley Groundwater Basin (**Figure 2-1**). All three of these Subbasins¹⁵ have been classified under the Sustainable Groundwater Management Act (SGMA) as in critical overdraft,¹⁶ due to long term declines in groundwater levels driven by groundwater use that has exceeded average recharge for many decades. The aquifer thickness in these subbasins typically increases to the west, with the aquifers thinning on their eastern margins and ultimately pinching out at their contact with the bedrock foothills. Many of the Self-Supplied Communities at greatest risk of water shortage in Madera County are threatened by declining groundwater levels in these Subbasins, especially on the eastern edges of Subbasins where aquifers are thinner. The ongoing implementation of SGMA by the various Groundwater Sustainability Agencies (GSAs) will be an important factor effecting the risk to Self-Supplied Communities of future groundwater declines in the alluvial subbasins of Madera County.

¹⁵ The GSPs of the three subbasins underlying Madera County can be viewed online at the following locations:

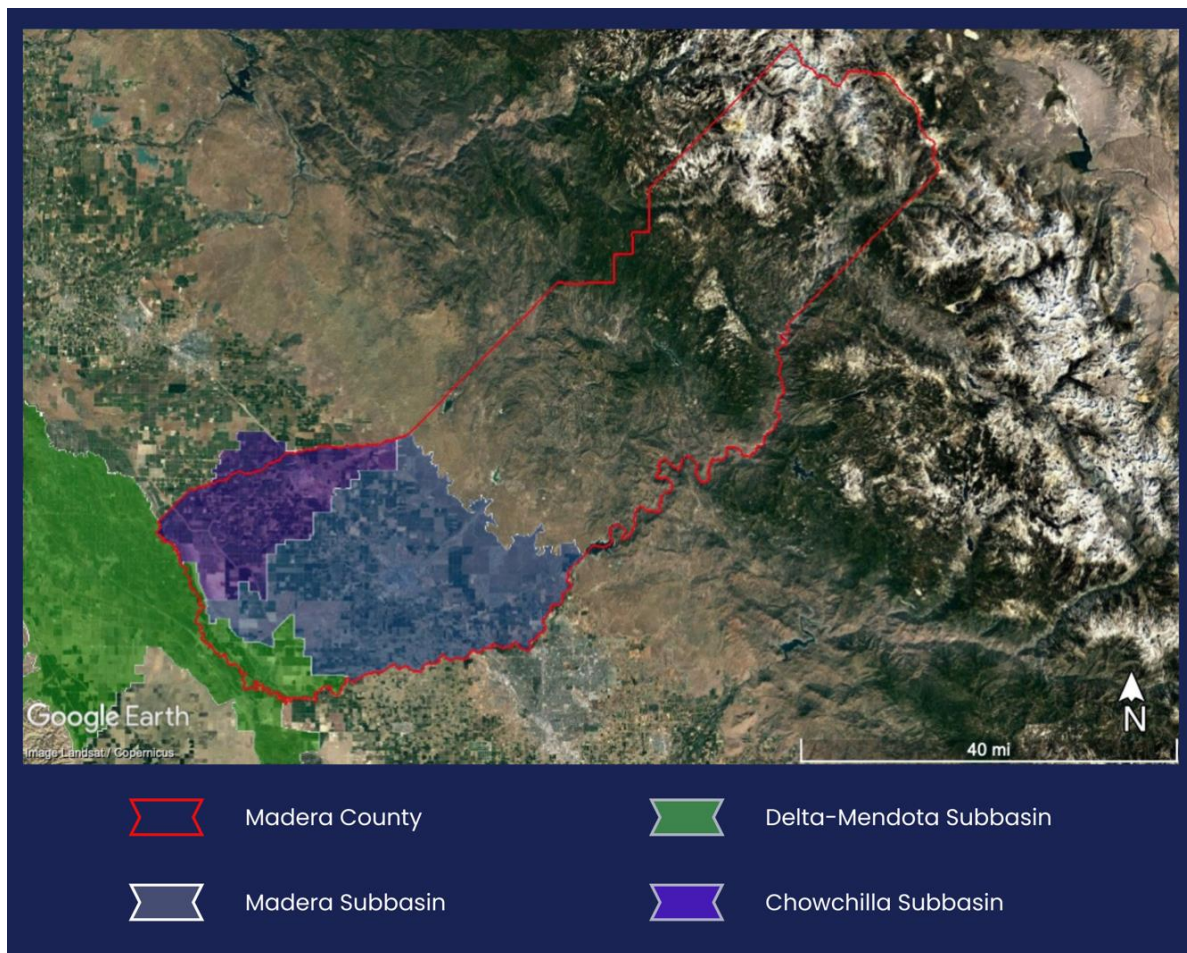
Madera Subbasin: <https://www.maderacountywater.com/madera-subbasin/>

Chowchilla Subbasin: <https://www.maderacountywater.com/chowchilla-subbasin/>

Delta-Mendota Subbasin: <https://www.maderacountywater.com/delta-mendota-subbasin/>

¹⁶ Department of Water Resources. (2022). *Basin Prioritization*. Retrieved from <https://water.ca.gov/programs/groundwater-management/basin-prioritization>

Figure 2-1: Groundwater Basins in Madera County



In the Sierra Nevada foothills, many communities and individuals rely upon wells drilled into fractured rock that the Department of Water Resources (DWR) does not recognize as being divided into distinct groundwater aquifers. As a result, SGMA does not apply to groundwater users in fractured rock areas. In fractured rock areas, groundwater is stored in the fractures, joints, bedding planes, and cavities of the rock mass, with water availability being largely dependent on the nature of the fractures and their interconnection. Most of the water systems in eastern portion of the County are individual and serve mostly untreated water for domestic purposes. Because the volume of water stored in fractured rock is typically much less than in alluvial aquifers, aquifers in the County's foothills region can be quickly impacted by droughts, which can result in rapid loss of productivity for domestic wells.

The majority of Madera County's local water resources ultimately originate as precipitation in the Sierra Nevada mountains, with high-elevation snowpack playing a particularly important role. According to California's Fourth Climate Change Assessment, climate change is already underway in the Sierra Nevada, affecting heat and precipitation extremes, with long-term warming trends, declining

snowpacks, and changes in streamflow timing.¹⁷ Over the coming decades, climate change will present new challenges to all Madera County water users.

2.2 DROUGHT AND WATER SHORTAGE RISK EXPLORER TOOL

To evaluate the relative risk of drought and water shortage vulnerability for Self-Supplied Community water systems, DWR collaborated with the Water Board and CDAG to develop a tool that used a common framework based on important risk indicators. The methodology used by the Risk Explorer Tool does not define thresholds whereby certain communities are “at risk” of drought and water shortage and others are not. Instead, according to the CDAG report, “the methodology inherently recognizes that all communities in California face some risk of drought and water shortage and thus provides a tool to calculate the relative risk of these suppliers and communities.”¹⁸ The primary benefit of the Risk Explorer Tool is to offer local and regionally specific information to assist with drought and water shortage planning.

The unit of analysis for the Risk Explorer Tool is the Census Block Group (the geographical unit used by the United States Census Bureau, typically between 600 and 3,000 people) with record of a domestic well installed within the last 50 years (1970-2019).¹⁹ Census Block Groups with zero population and those with no record of a domestic well within the last 50 years were excluded from the analysis. In Madera County, an estimated 36,667 households reside in the Census Block Groups evaluated by the Tool (but not all of those households are Self-Supplied, as defined by this report). 9,606 domestic wells have been recorded with DWR in Madera County over the last 50 years.²⁰ The Census Block Groups do not necessarily represent individual “communities” in the traditional sense of the word, but they do cover areas where population resides. The Risk Explorer Tool used this spatial unit for its analysis to allow DWR to access demographic information that is otherwise not available. Actual drought risk *within* each census block can vary substantially, because even close neighbors may rely on different water sources or be served by wells of different ages and depths. The Risk Explorer Tool is therefore useful for a broad overview of how risk varies across the County but should not be assumed to reflect the actual drought risk of any specific water system or domestic well.

2.2.1 Risk Indicators

The Risk Explorer Tool identifies 20 indicators for the Self-Supplied Community grouping. These indicators were created to cover three general categories of risk defined by the State Water Resources Control Board (SWRCB), CDAG, and other stakeholders. These components are: (1) the exposure of suppliers and communities to hazardous conditions and events, (2) the physical and social vulnerability

¹⁷ Dettinger, M., Alpert, H., Battles, J., Kusel, J., Safford, H., Fougères, D., Knight, C., Miller, C., Sawyer, S., (2018). Sierra Nevada Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-004. https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-004_SierraNevada_ADA.pdf


¹⁸ California Department of Water Resources Water Use Efficiency Branch. (2021). Small Water Systems and Rural Communities Drought and Water Shortage Contingency Planning and Risk Assessment, Part 2 – Drought and Water Shortage Vulnerability Assessment and Risk Scoring.

¹⁹ California Department of Water Resources Water Use Efficiency Branch. (2021).

²⁰ As of July 2022

of suppliers and communities to the exposure, and (3) recent history of shortage and drought impacts.²¹ From these categories, the Risk Explorer Tool drilled down to the individual indicators and separated them into five Risk Component (RC) groups, with each component broken into individual metrics (**Figure 2-2**).

Figure 2-2: Risk Indicators, Self-Supplied Communities

 DROUGHT AND WATER SHORTAGE RISK INDICATORS SELF-SUPPLIED COMMUNITIES				
Component 1: <i>Climate Change</i>	Component 2: <i>Exposure to Current Conditions and Events</i>	Component 3: <i>Physical Vulnerability</i>	Component 4: <i>Social Vulnerability</i>	Component 5: <i>Water Shortage Record</i>
<ul style="list-style-type: none"> • RC1a – Temperature Shift • RC1b – Wildfire Risk • RC1c – Saline Intrusion Risk 	<ul style="list-style-type: none"> • RC2a – Drought Early Warning 2019 • RC2b – Wildfire Risk • RC2c – Fractured Rock Area • RC2d – Subsidence Presence • RC2e – Salt Presence (basin) • RC2f – Overdrafted Basin • RC2g – Declining Water Levels • RC2h – Population Growth • RC2i – Water Quality Index • RC2j – Surrounding Irrigated Agriculture 	<ul style="list-style-type: none"> • RC3a – Well Depth Flag • RC3b – Well Depth Proportion 	(Aggregated as RC4) <ul style="list-style-type: none"> • Per capita income • Median household income • % below poverty level • % 65 and over • \$ under 17 • % under 5 • % mobile households • % households with no vehicles • % over 25, no HS diploma • % single parent • % civilian unemployed • % in group quarters • % Renters 	<ul style="list-style-type: none"> • RC5a – Reported Household Outages on Domestic Well • RC5b – Reported Household Outages on Private Well

"RC" = Risk Component

Brief descriptions of the risk indicators shown in **Figure 2-2** are listed below with the data source in parentheses.

Component 1 – Climate Change:

- **RC1a Temperature Shift** tracks projected increase in maximum temperature by mid-century, averaged across climate models. (DWR)
- **RC1b Wildfire Risk** projects severe or high-severe wildfire risk for each block group boundary. (UC Merced)

²¹ p. III, Small Water Systems and Rural Communities Drought and Water Shortage Contingency Planning and Risk Assessment - Part 2 – Drought and Water Shortage Vulnerability Assessment and Risk Scoring

- **RC1c Saline Intrusion Risk** identifies susceptibility to seawater intrusion as measured by 1 meter of sea level rise into coastal aquifers. (University of Wyoming/USGS)

Component 2 – Exposure to Current Conditions and Events

- **RC2a Drought Early Warning** tracks an annual early drought risk warning indicating less than 70% of average precipitation by Jan 31 of that water year. (PRISM OSU)
- **RC2b Wildfire Risk** models the current risk maximum for wildfire for each block group. (CalFire)
- **RC2c Fractured Rock Area** shows if the community is located in a fractured rock area. (DWR)
- **RC2d Subsidence Presence** documents a record of subsidence within the block group. (DWR)
- **RC2e Salt Presence (basin)** documents a record of salts and salt intrusion points in the basin. (DWR)
- **RC2f Overdrafted Basin** shows if the area is in a critically overdrafted basin. (DWR)
- **RC2g Declining Water Levels** identifies declining groundwater levels. (DWR)
- **RC2h Population Growth** uses census data to estimate population growth rate to determine projected population growth. (DWR)
- **RC2i Water Quality Index** indicates the likelihood that groundwater accessed by domestic wells may contain constituents above regulatory levels. (SWRCB)
- **RC2j Surrounding Irrigated Agriculture** identifies the presence of irrigated agriculture in the surrounding basin. (DWR)

Component 3 – Physical Vulnerability

- **RC3a Well Depth Flag** flags “relatively shallow” well depth if any portion of the groundwater units that intersect with the block group. (OSWCR-DWR)
- **RC3b Well Depth Proportion** identifies where max depth of domestic wells is 10% or more shallow than the max depth of public wells. (OSWCR-DWR)

Component 4 – Social Vulnerability

- **RC4** is a composite index of demographic indicators shown in **Figure 2-2**, from the American Community Survey 2012-2016 and 2010 US Census.

Component 5 – Water Shortage Record

- **RC5a Reported Household Outages on Domestic Well** indicates the presence of one or more households that have reported a domestic well outage in the block group. (DWR)
- **RC5b Reported Household Outages on Private Well** shows the proportion of households with reported outages in the block group using a 0-1 scalar metric. (DWR)

Some risk components have less implication than others in Madera County; for instance, because the County is located more than 70 miles inland, seawater intrusion is not a concern. And some risk components are more applicable in some parts of the County than in others. The geographic differences

in the County from east to west provide good examples of this. The eastern census block groups have high risk associated with RC2c-Fractured Rock Area, as they are located in the foothills and mountainous areas outside of the alluvial groundwater basin. Up at these higher elevations those communities would be less impacted by surrounding irrigated agriculture (RC2j) and subsidence (RC2d) than lower elevation Central Valley communities.

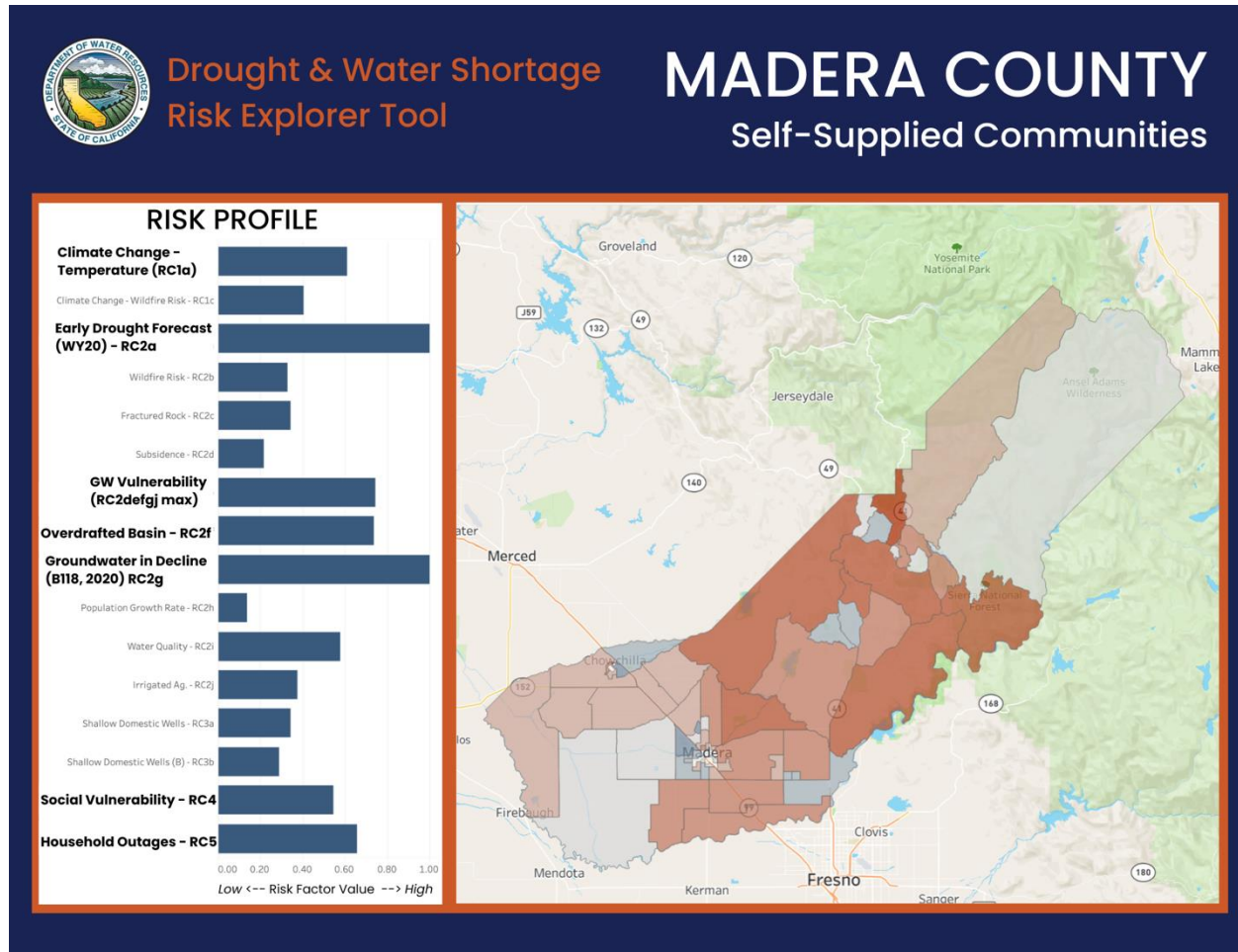
2.2.2 Analysis and Results

Section 2.2.2 provides more detailed analysis for the County as a whole, and specific census block groups in Madera County. The Risk Explorer Tool tracks the specific risks associated to these different geographic Self-Supplied communities within the County.

County-Wide Risk

As a whole, Madera County scores high in multiple risk component categories. Specifically, Groundwater Vulnerability risk is high due to multiple factors. Subsidence, declining groundwater levels, and critical overdraft in the basin contribute to the high RC2 score. The current ongoing drought is a major component of continued risk in the RC2 category. The RC4 score emphasizes some of the social vulnerability due to County demographic indicators shown in **Figure 2-2**. Reported household well outages (RC5) and risk of projected temperature increases due to climate change (RC1) are also significant factors.

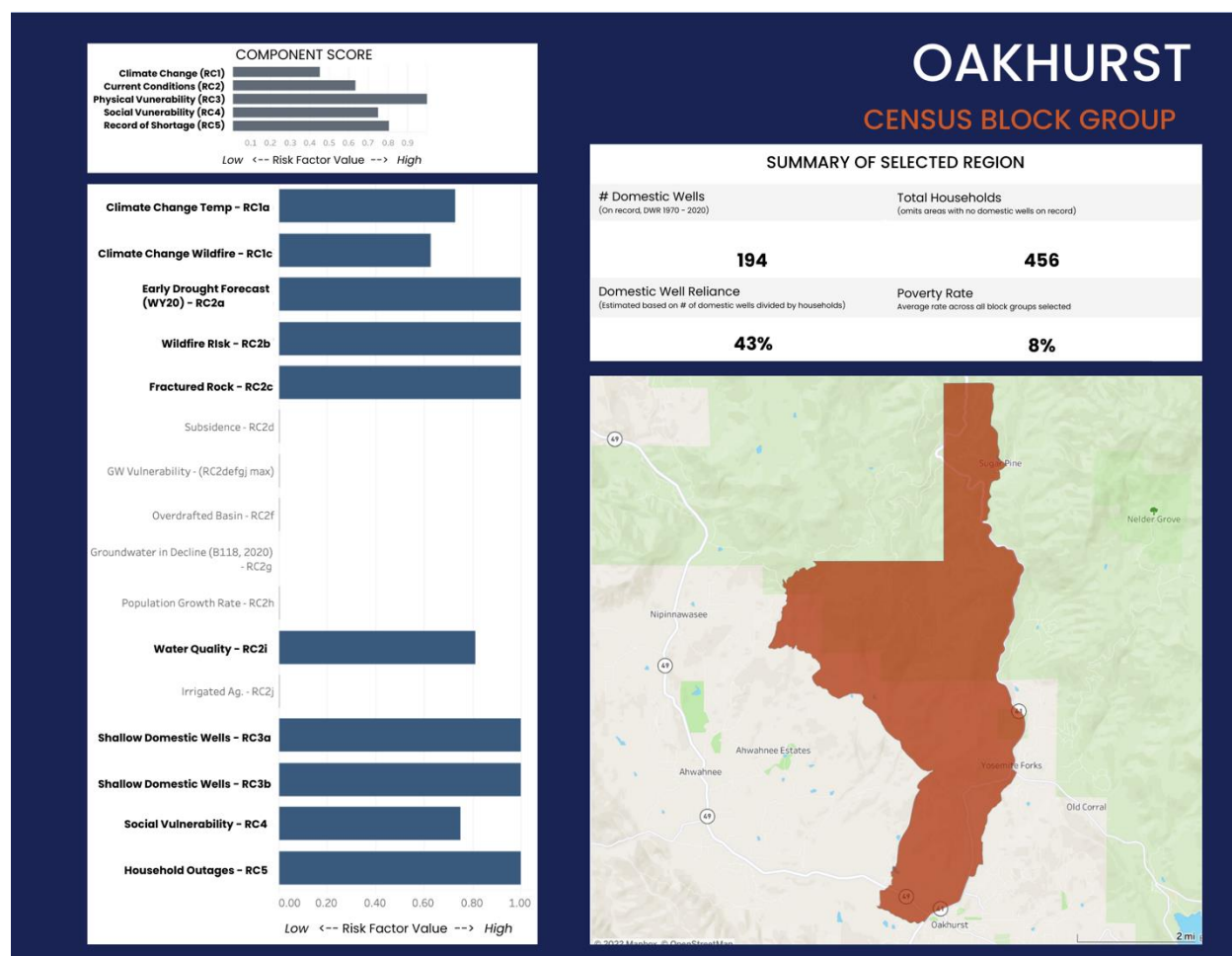
Figure 2-3: County-Wide Risk Assessment



Specific Area Risk

The following subsections will examine risk at specific locations and highlight the variability within the county.

Figure 2-3-A: Risk Focus Area 1: Oakhurst



The northern Oakhurst area, located in the Sierra Nevada foothills scores very high in several categories of risk. Drought and increased temperature due to climate change play a part, but physical vulnerability and the record of water shortage are largest factors in the overall census block group score.

The physical characteristics of note in this part of the County are wildfire risk, and the presence of shallow domestic wells. The eastern foothill wells can be less reliable when groundwater levels are depleted or in drought conditions. Most of the wells contributing to this dataset for RC3b are notably shallower than public wells in the area. RC3b is described as “max depth of domestic wells is 10% or more shallower than the max depth of public wells.” This area is outside alluvial basins, where fractured rock wells comprise most of the household and private water supply. These wells usually have lower yield and are less reliable because they rely on rock fissures, unknown underground fracture size, and unknown interconnectivity for recharge. They are also harder to monitor and therefore reliability is more uncertain. 43% of the households in this area rely on domestic wells, which adds to the risk score.

Figure 2-3-B: Risk Focus Area 2: Fairmead

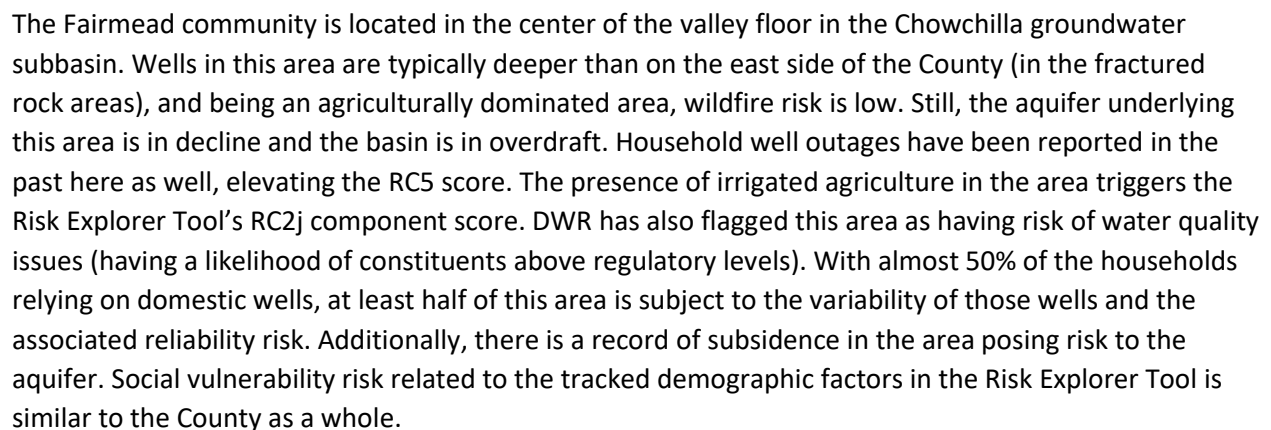
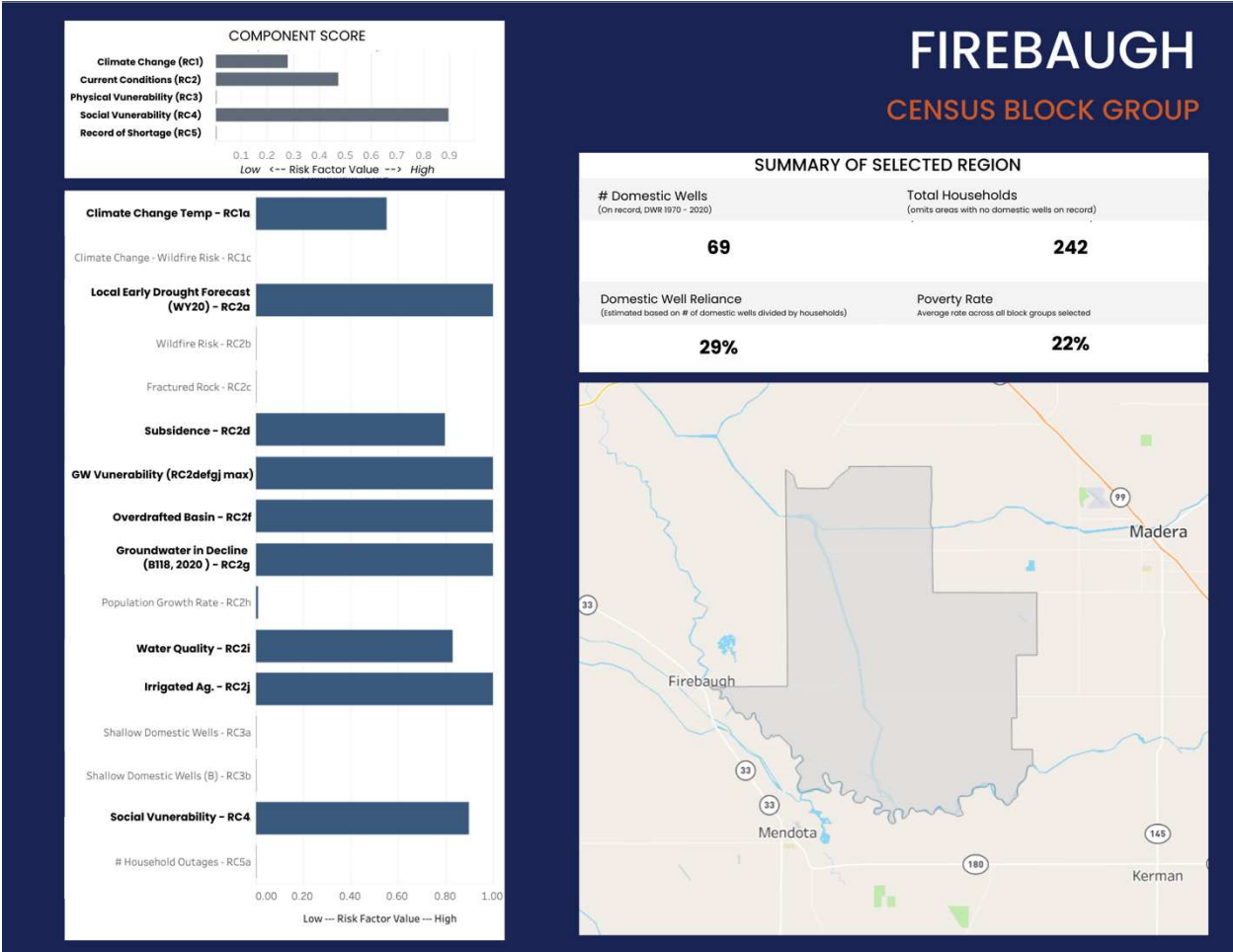


Figure 2-3-C: Risk Focus Area 3: Firebaugh



The Firebaugh block group²² is one of the largest census block groups in the County and shares its southern border with the San Joaquin River. Like the other valley floor communities in the County, wildfire risk and domestic well depth RC scores are low. Despite there being a record of basin overdraft and groundwater in decline, there have not been any reported household well outages. Similar to the other communities overlaying the western part of the alluvial basin, the depth of domestic wells is not considered a risk factor. Social vulnerability risk indicators are slightly higher in this block group, and subsidence has also been observed in the area. Despite these risk indicators, the aggregate RC score is low enough to categorize the risk for Firebaugh as low relative compared to the rest of the County.

2.2.3 Limitations of Analysis

The Risk Explorer Tool is useful for helping determine overall drought risk trends and vulnerabilities across broad block-level areas, but its effectiveness for providing risk evaluation at the household-level and incorporating specificity into its overall risk evaluation is limited. While the RC indicator model and methodology are comprehensive and the result of a large, coordinated effort of experts and a diverse

²² The Firebaugh block group is located in Madera County, near the Fresno County community of Firebaugh. The Firebaugh block group, as defined by the US census, does not contain the City of Firebaugh.

group of stakeholders, there is inherent variability within the units of analysis. The Tool is unable to comprehensively communicate risk through an aggregated score based on census block groups.

The variability between household wells within the same block group is hard to quantify. Water quality is specific to individual well locations, underlying geology, and proximity to potential contaminants and presence of salinity. For instance, a single property with multiple wells can have different water quality from well to well along with different productivity and risk. Importantly, household and private well data is only as accurate as the reporting and record keeping. Some households and communities may be averse to reporting the presence of a well or outages for a variety of reasons, from lack of trust in government institutions, to language barriers, or simply being unaware of reporting tools or requirements.

Examining the individual Risk Components from the Risk Explorer Tool, putting them into context using County-specific knowledge and engaging additional resources will complement the Risk Explorer Tool's data sets and maximize the effectiveness of the County's drought planning and response. Section 4 expands on these ideas through the proposed Action Plan.

2.3 CALIFORNIA'S GROUNDWATER LIVE: WELL INFRASTRUCTURE INFORMATION

DWR's GWLive²³ is another online resource that provides a suite of dashboards to assess the state's latest groundwater information on groundwater conditions, groundwater levels, well infrastructure, and land subsidence. The Well Infrastructure section of GWLive²⁴ includes dashboards to help identify the location of individual domestic wells, their susceptibility to going dry, and a record of well characteristics and reliability.

GWLive uses Geographic Information Systems (GIS) "story maps" for spatial analysis of California groundwater resources, based on data from Well Completion Reports (WCRs) to DWR's Online System of Well Completion Reports (OSWCR). These maps are valuable for determining well location, depth, age, and other defining characteristics, as well as assessing susceptibility and patterns of outages. GWLive can help the County evaluate future risk for Self-supplied communities with greater spatial detail than the Drought Risk Explorer Tool described in *Section 2.2*. The following sections (2.3.1 - 2.3.3) present information available through three GWLive tools²⁵ used for preparation of this Drought Plan: Domestic Wells, Reported Dry Wells, and Dry Domestic Well Susceptibility within Groundwater Basins.

2.3.1 Domestic Well Tools

The location of domestic wells, along with the details filed in the OSWCR, is useful to understand where wells are concentrated in the County and what communities rely on domestic and private wells. The Domestic Wells Tool²⁶ in GWLive pulls information from the state's Well Completion Reports, which have been required for every person who "digs, bores, or drills a water well" by California Water Code §

²³ <https://sgma.water.ca.gov/CalGWLive/>

²⁴ <https://sgma.water.ca.gov/CalGWLive/#wells>

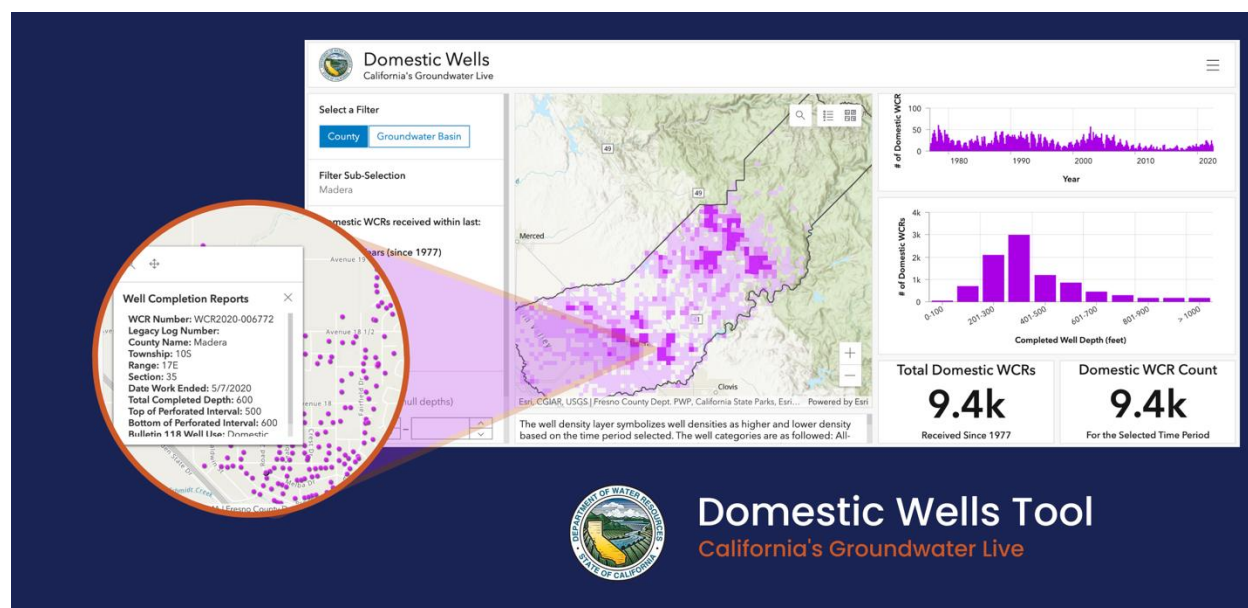
²⁵ All GWLive Well Infrastructure Dashboards can be accessed at:
<https://storymaps.arcgis.com/stories/f2b252d15a0d4e49887ba94ac17cc4bb>

²⁶ Accessed at: <https://www.arcgis.com/apps/dashboards/24a820bfd4a54859993fde22384f654f>

13751 since January 1997. Key pieces of information include total depth of the well, and depth of water in the well.

When zoomed out, the tool presets a well density layer that indicates the number of wells on file with the OSWCR to give a macro understanding of where domestic wells are concentrated. These densities are categorized into “high, medium, low” on the map according to the timeframe selected. The map allows zooming to view approximate locations of individual wells which can be clicked to display the OSWCR data for that individual well. Filters for number of well WCRs received by OSWCR in the past year and all time give the user an understanding of well drilling activity which could indicate new water needs or desire for improved groundwater access. Well depth filters are also available to display location and density of wells by depth. This allows for quick analysis of what individual wells could be more at risk due to declining groundwater conditions in certain locations. **Figure 2-3** shows the Domestic Wells Tool display with the well density layer indicating concentration of all wells that have been reported within the County since 1977.

Figure 2-4: Domestic Well Density Tool



2.3.2 Dry Well Reporting Tool

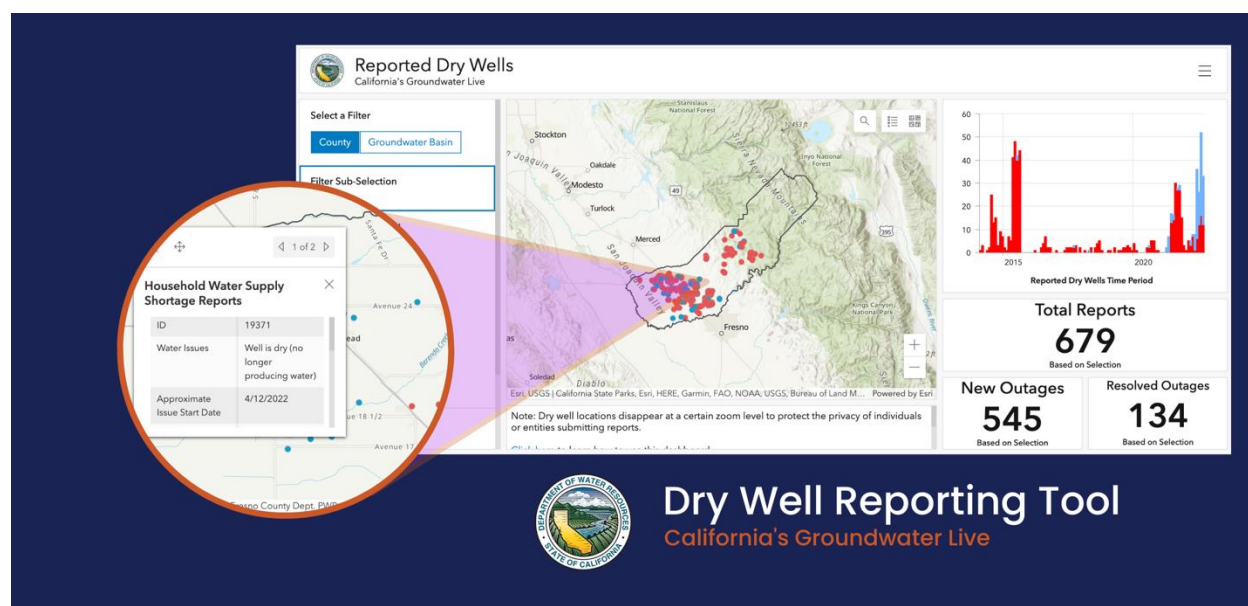
The GWLive Reported Dry Wells²⁷ tool is intended to inform state, county and local agencies of drought impacts on household water supplies. If households are experiencing issues with well production, they should be encouraged to complete the Dry Well Report Form. Data collected includes contact information of the household reporting the issue, water shortage issue and location, and well log data. This data is displayed in a map with specific location of reported outages. Filters allow users to select a time period within the last year or see all dry well reports from 2014 to present. The Report Type filter shows either reported outages, resolved outages, or both as plots on the map. Clicking on the individual

²⁷ Accessed at: <https://dwr.maps.arcgis.com/apps/dashboards/bd00ee8c357c449ca4ac5714bb95a81c>

report on the map shows the individual well detail that the reported issue, including the basin and subbasin name. Resolved Outage reports indicate that a well that reported an outage in the past was updated during the report time period selected as having started producing water again.

Using the Reported Dry Wells Tool to identify geographic and basin-specific trends can help risk assessment for nearby wells, especially when combined with data regarding well depth and reported depth of water in the well. Households are also given homeowner resources such as links to contact the County's Office of Emergency Services, well contractors, and County well permit application links in case of a need to refurbish or drill a new well. The Reported Dry Wells Tool is shown in **Figure 2-4**.

Figure 2-5: Dry Well Reporting Tool



2.3.3 Dry Domestic Well Susceptibility within Groundwater Basins Tool

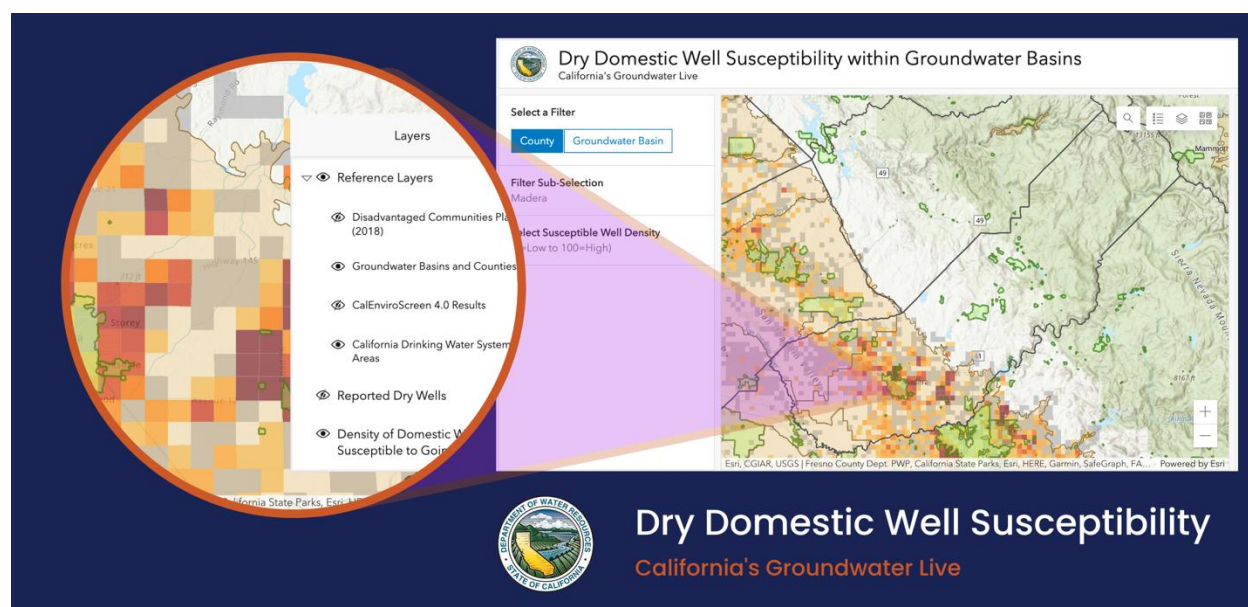
The Dry Domestic Well Susceptibility within Groundwater Basins Tool²⁸ identifies areas within groundwater basins that may be prone to groundwater shortages and domestic wells going dry. The map displays susceptibility per square mile based on analysis combining the latest information on domestic well locations, depths, and local groundwater level conditions. The dashboard identifies the density of "susceptible" domestic wells per square mile based on a combination of domestic well locations and depths, recent groundwater level measurements, and modeled future depth to water. If the modeled future depth to water falls below the dry well depth of a domestic well, the well is labelled susceptible. The map allows users to filter the map display by county and groundwater subbasin, with risk presented as a color-coded grid (with redder colors indicating higher risk). The interactive map also includes optional reference layers showing contributing risk factors for susceptibility such as: Disadvantaged Communities, CalEnviroScreen 4.0 Results, and California Drinking Water System areas.

²⁸ Accessed at: <https://dwr.maps.arcgis.com/apps/dashboards/f876cfa53ce3466c8b3778e7f4adb50e>

Risk assessment for the County can be best visualized by using the grid overlay. Each grid square is one square mile with colors representing density of wells susceptible to going dry; gray squares represent areas with wells not susceptible, tan squares show a low density of susceptible wells, and purple represents a high density of susceptible wells. This grid view can help the County anticipate where wells may go dry based on the historical conditions and applicable risk indicators. These density views can help inform the County’s decisions and action plans for drought preparedness and response. The tool is intended to be used for informational forecasting to help prepare for well outages before they occur.

Figure 2-5 shows the Madera County view, with the California Drinking Water System Areas layer (green outlines) enabled. Much of the County is outside of these drinking water system areas; and it is appropriate to draw attention to these self-supplied zones with high susceptibility that are without the resources of a centralized drinking water system. **Figure 2-5** zooms in on the grid and with the Reported Dry Well view enabled (dots), and the susceptibility detail data shown. This detail enables the user to understand how many wells are at risk, and whether previous reports have been made.

Figure 2-6: Dry Domestic Well Susceptibility within Groundwater Basins Tool



Because groundwater elevation monitoring is limited to the alluvial basins on the valley floor, users will notice the eastern part of the County does not have the grid overlay. Because of their underlying geology, fractured rock aquifers do not allow for comprehensive monitoring, and therefore dry well susceptibility in areas outside of the SGMA and CASGEM monitoring networks are not shown in the tool.

The County can also encourage Self-Supplied communities to use this tool to evaluate their own susceptibility, and to keep their Dry Well Reporting²⁹ submissions current, which will allow greater accuracy in the Dry Well Susceptibility tool.

²⁹ Accessed at: <https://mydrywell.water.ca.gov/report/>

2.4 SAFE AND AFFORDABLE FUNDING FOR EQUITY AND RESILIENCE (SAFER) DRINKING WATER NEEDS ASSESSMENT DASHBOARD

The SWRCB has implemented the SAFER program which provides a set of dashboards, funding sources, and regulatory authorities designed to assist Californians who currently lack safe and affordable drinking water as quickly as possible.³⁰ This is done through the identification of public water systems and domestic and private wells that are considered “at-risk” of failing. Therefore, the SWRCB can proactively target these areas through technical and financial assistance.³¹

According to the SAFER Drinking Water Needs Assessment Dashboard³², the Failing systems are identified based on Monitoring and Reporting Violations, Primary Maximum Contaminant Level (MCL) Violations, Secondary MCL Violations, Treatment Technique Violations, or E. coli Violations. When a water system fails to conduct regular monitoring, fails to address MCL violations, or does not follow the required treatment techniques to reduce risk from contaminants, the system is considered failing.

In accordance with federal regulations, public water systems are required to sample water sources to determine compliance with drinking water standards. In the County, all well drilling activities require a permit from Madera County Environmental Health Division (EHD). However, after initial well construction, only State Small Water Systems (5-14 service connections) are required to regularly monitor and report water quality data to the Madera County Environmental Health Division (EHD). EHD does not have any ongoing regulatory oversight authority over domestic wells and self-supplied residences, so EHD cannot monitor water quality data for of these wells.

The water systems on the Drinking Water Needs Assessment Dashboard Map are organized by different risk categories including Failing, At-Risk, Potentially At-Risk, Not At- Risk, and Not Assessed. For state small water systems, the risk status is based on aquifer risk reflecting the drinking water quality. Furthermore, the database search can be filtered by number of service connections and population within a county or city. The map display is useful to visually see the identified service connections with the current SAFER status.

Using the SWRCB online database tools will be helpful in determining individual facilities and communities that are at-risk and failing. Based on the SAFER mapping tool results, **Figure 2-6** below shows the list of water systems identified as small (0-20 service connections) with the associated risk status as of August 2024.³³ There are roughly 6,000 residents that rely upon a small water system for their potable water supply in the County.³⁴ Out of the small water systems identified, 7 systems are

³⁰ State Water Resources Control Board. (2022). *About the SAFER Program*. SAFER Drinking Water. <https://www.waterboards.ca.gov/safer/background.html>

³¹ Association of California Water Agencies. (n.d.). SAFER Webinar: Identifying “At-Risk” Public Water Systems and Wells. <https://www.acwa.com/events/safer-webinar-identifying-at-risk-public-water-systems-and-wells/>

³² Accessed at: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/2022.html

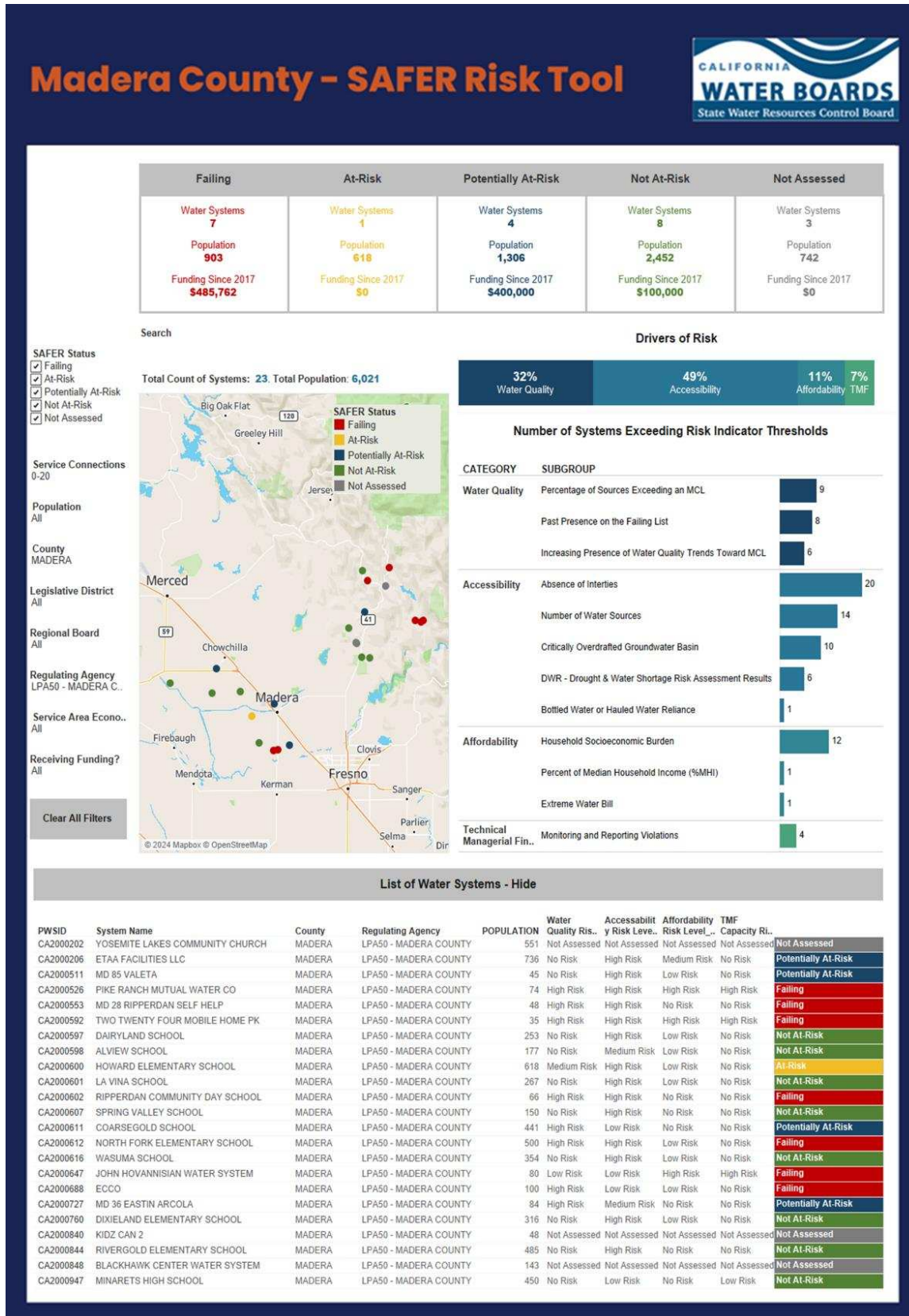
³³ The SAFER tool is maintained by the State Water Resources Control Board and may be updated periodically.

³⁴ State Water Resources Control Board. (2024). SAFER Status Tool. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html

considered failing, one (1) system is at-risk, and four (4) systems are potentially at-risk.³⁵ Recognizing what the weaknesses are in a specific water system can help create clarity for future action. Every failing system identified within the County resulted from a water quality or accessibility risk category. While the water quality challenges documented by the SAFER tool are not necessarily caused by drought, water systems that are currently struggling with water quality may be at heightened risk of water shortage during droughts, when alternative water supplies are least available. The SAFER tool therefore provides additional useful context when evaluating drought risk in the County.

³⁵ In 2022, the SAFER tool indicated that roughly 7,700 residents relied upon small water systems for their potable water supply in the County and identified three (3) additional small water systems when compared to the 2024 data. Out of the small water systems identified in 2022, the SAFER tool indicated that nine (9) systems were considered failing and five (5) systems were at-risk of failing.

Figure 2-7: SAFER Status of Small Water Systems in Madera County



2.5 COMMUNITY KNOWLEDGE & STAKEHOLDER INPUT

Stakeholders in the County were given the opportunity to comment on the draft contents of Section 2 of this Drought Plan during the Friday, September 16, 2022 meeting of the Madera County Drought Work Group.

During the meeting, one major theme that emerged in multiple comments was the different challenges facing Valley Floor and Foothill communities. In the foothills, lack of broadband access and less reliable electricity service due to Public Safety Power Shutoffs (PSPS) may prevent constituents from accessing internet resources, including information on how to report dry wells. Foothill communities also face groundwater quality issues, some of which originate from naturally occurring contaminants such as arsenic and uranium that are found in fractured rock aquifers. In contrast, Stakeholders noted that many of the Valley Floor communities face risks associated with long term groundwater declines that are not simply caused by a single dry year. Valley Floor communities may also be more likely to speak a language other than English.

Throughout the County, the age and maintenance status of domestic wells was identified as a major factor causing well outages. Many wells have not been regularly serviced and maintained, which makes the individuals and communities that rely on these wells more vulnerable to outages. Well installation date was suggested as another factor that may be useful for predicting future outages.

There was general agreement among Stakeholders present at the meeting that Community-Based Organizations (CBOs) such as Self-Help Enterprises (SHE) are key to effective Drought Response Actions. Even in areas of the County that lack broadband internet, SHE is able to submit well outage reports on behalf of residents and can offer services in both English and Spanish.

2.6 RISK SUMMARY AND CONCLUSIONS

The analysis presented in *Section 2* indicates Madera County faces a variety of risks related to drought and water shortage. The Drought Risk Explorer Tool highlights multiple intersecting risk factors facing communities, including long term groundwater declines, climate change, and social vulnerability. In particular, the risks faced by communities in the Valley Floor and Sierra Nevada Foothills regions of the County are quite different. Throughout the County, declining groundwater levels, history of well failure, dry domestic well susceptibility, and are among the key indicators of drought and water shortage risk. Domestic wells drilled into fractured rock also face heightened risk.

DWR's GWLive Dashboards provide additional detail on drought risks to domestic wells in the County. There is a high degree of domestic well reliance, including some wells that are relatively old or shallow. The County has experienced increases in the number of domestic well outages during recent droughts, with those outages often concentrated in specific communities. Many of these same communities may be highly susceptible to future domestic well outages, because well depths are relatively shallow compared to underlying groundwater levels.

The SAFER Tool focuses on drivers of risk such as water quality and accessibility indicators that may not be directly related to drought risk, but the water systems that are currently struggling in these categories may be at heightened risk of water shortage during droughts, when alternative water supplies are least available.

The Drought Risk Explorer Tool, California GWLive datasets, SAFER Tool, and stakeholder feedback indicate the County has a complex combination of drought risks, and the severity of these risks manifests differently in the Valley Floor and Foothill regions of the County. Climate change will continue to present new challenges to drought response. A coordinated effort is paramount to address these vulnerabilities and risk factors for all communities, as detailed in the Shortage Response Actions presented in *Section 4*.

3 Small System Consolidation Opportunities

Senate Bill 552 requires the County to consider Water System Consolidation,³⁶ which is the joining of two or more water systems in a manner to improve the reliable supply or quality of drinking water for at least one of the systems. Typically, consolidation involves a smaller water system being absorbed into a larger system, extending drinking water infrastructure or the extension of water services to households on domestic wells and communities that are not connected to publicly regulated systems.³⁷ However, because of the rural nature of most of Madera County, there may be limited opportunities to achieve consolidation of small water systems.

In 2015, the California State Legislature passed Senate Bill 88 which authorized the SWRCB to facilitate the consolidation of severely underperforming water systems.³⁸ For water systems that the SWRCB has not designated as severely underperforming, consolidation remains voluntary. The County does not have the authority or desire to compel mandatory consolidation but may support voluntary consolidation where appropriate.

Consolidation can offer many benefits in improved system resiliency and customer affordability, but the process to achieve successful consolidation is complex. A key challenge for small water systems is high costs of providing water; a larger water system can achieve lower costs for drinking water per individual by spreading capital, maintenance, and operational costs across a larger pool of ratepayers.³⁹ Service rates can be significantly higher for small systems due to outdated infrastructure and deferred maintenance. Furthermore, consolidation can promote responsible economic growth within communities and reduce the risk of adverse health impacts on customers.⁴⁰

This section of the Drought Plan provides an overview of consolidation types, implementation approaches, and a discussion of the communities within the County that have already pursued consolidation. This section concludes with recommendations and next steps to guide the County's implementation of consolidation support.

3.1 TYPES OF SYSTEM CONSOLIDATIONS

Consolidation can involve a spectrum of collaborative efforts that merge aspects of two or more water systems. Consolidation can occur at a managerial level, such as merging and sharing of operations like administration and billing. Consolidation can also be considered at the physical level, which involves the

³⁶ §10609.70 of the California Water Code

³⁷ Lai, L., (2017). *Adopting County Policies Which Limit Public Water System Sprawl and Promote Small System Consolidation*. University of California, Los Angeles, Luskin School of Public Affairs. https://innovation.luskin.ucla.edu/wp-content/uploads/2019/03/Adopting_County_Policies_which_Limit_Public_Water_System_Sprawl_and_Promote_Small_System_Consolidation.pdf

³⁸ Lai, L., (2017).

³⁹ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018). *Learning from California's Experience with Small Water System Consolidations*. Wheeler Water Institute Center for Law, Energy & the Environment University of California, Berkeley, School of Law. https://www.law.berkeley.edu/wp-content/uploads/2018/05/SmallWaterSystemConsolidation_2018-05-02.pdf

⁴⁰ Lai, L., (2017).

merging of the physical water system infrastructure, including distribution pipelines and water treatment facilities.

3.1.1 Managerial Consolidations

Managerial Consolidation involves the technical, managerial, and financial (TMF) components where systems combine billing, equipment sharing, and merging staff or consultants into one system.⁴¹ A managerial consolidation can be better suited for two or more systems within 30 miles or less of each other. Because managerial consolidations require the merging of staff and human resources into one system, a consideration of commute time is important. It is suggested that a commute greater than one-hour results in reduced productivity and efficiency.⁴²

Smaller systems are less likely to have the TMF necessary to ensure a drinking water system is compliant with state and federal requirements. Rural systems servicing disadvantaged communities, especially when they are largely or entirely reliant on groundwater, may struggle to provide and maintain clean and reliable drinking water. Furthermore, prolonged insufficient TMF can result in a cycle of instability for the system. Hiring experienced staff and conducting rate studies are critical in determining the real costs of providing water and managing long term system assets. A small system may not fully know the condition of their assets and may run the risk of system failure because they are unable to maintain or replace them.⁴³ Small water systems facing TMF challenges may be good candidates for managerial consolidations, which can allow the consolidated system to achieve economies of scale in its staff and equipment without the cost of constructing new physical infrastructure.

3.1.2 Physical Consolidation

Physical consolidation involves the merging, sharing, or expansion of the physical water system infrastructure, including distribution pipelines and water treatment facilities. The best candidates for physical consolidation are systems or private well communities that are within three miles or less due to potentially high development costs to connect pipelines and other infrastructure needs.⁴⁴

3.1.3 Regionalization

Regionalization is consolidation on a larger scale, when two or more water systems or private well communities form into a single system. It can be used when a large geographic area, such as a watershed, an entire county, or several local water systems or communities form into a combined system. This route is considerably more legally complex, but the overall goals and outcomes are functionally similar. The process of regionalization could result in water partnerships such as formal agreements and joint ventures that may not require the degree of infrastructure integration associated with physical consolidation.⁴⁵

⁴¹ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

⁴² Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

⁴³ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

⁴⁴ Porter, K., Bostic, D., & Shimabuku, M., (2020). *Building Resilience and Addressing Inequities in Small, Underperforming Drinking Water Systems*. Pacific Institute. <https://pacinst.org/building-resilience-addressing-inequities-in-small-underperforming-drinking-water-systems/>

⁴⁵ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

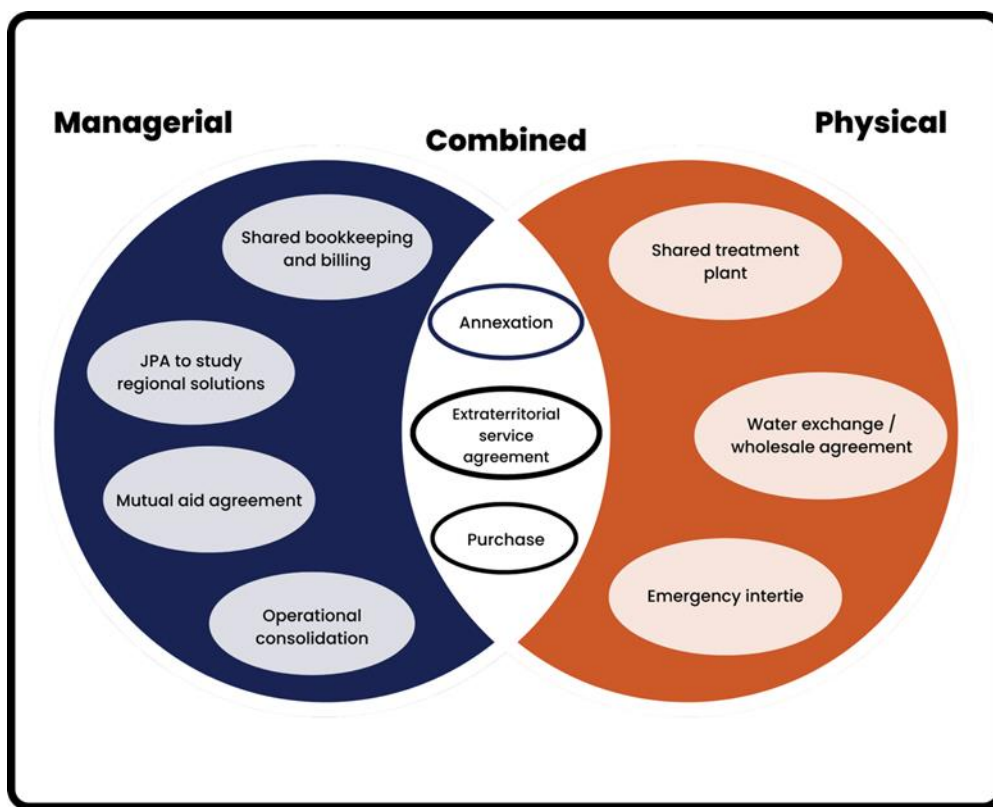
3.2 ACCOMPLISHING CONSOLIDATIONS

There is an array of institutional arrangements and structures to implement consolidation. It should be emphasized that consolidation possibilities can be a continuous process that does not need to be over-categorized.⁴⁶ Remaining open to potential possibilities of combinations and options for participation is important when seeking a solution.

Institutional Arrangements and Structures to Implement Consolidation

Figure 3-1 below illustrates the combined relationship options between physical and managerial consolidation, such as annexation of unincorporated areas into cities, extraterritorial service agreements, and purchases. There has also been success from the managerial consolidation structures through Joint Powers Agreements (JPAs) and mutual aid agreements; as well as shared bookkeeping and billing or shared operations staff. Furthermore, physical options of water exchanges or wholesale agreements, emergency interties (or interconnection), and shared treatment plants create solutions for at risk communities without access to water.⁴⁷

Figure 3-1: Merging Aspects of Two or More Water Systems⁴⁸



⁴⁶ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

⁴⁷ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

⁴⁸ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

Funding Sources

Financial incentives and additional support for small systems can reduce inequities and challenges when considering consolidation opportunities. Because consolidation can result in short-term rate shock and long-term rate increases, funding is crucial to achieve progress and successful consolidation efforts. Funding and grant opportunities may be available for consolidation purposes through the DWR and the SWRCB Drinking Water State Revolving Fund for financing consolidation projects. Also, the SWRCB opened a Regional Funding Solicitation⁴⁹ for eligible partner entities to receive funding for regional programs related to drought or contamination issues with small water systems. The eligible project types to receive funding include assessments such as community outreach or domestic well testing as well as interim solutions to deliver bottled and hauled water, provide tanks, and POU/POE systems. Long-term programs such as well repairs or replacements, and limited scale consolidations are eligible. Applications are submitted using the SWRCB's Financial Assistance Application Submittal Tool (FAAST). Additional funding may be also available through the Integrated Regional Water Management (IRWM) grant program, but the future of the IRWM program is uncertain at this time. Ultimately, the availability of outside funding support will affect the feasibility of most small water system consolidations.

Outreach Strategies and Accessible Information

Providing accessible information is one strategy for implementing consolidation promotion, by offering learning opportunities that are tailored to small water systems. The information presented can include a variety of water system topics, such as the financial and health benefits from consolidation and the threats small systems face. The information would promote the overall goals of small water system consolidation with curricula and materials that are accessible to participants from various County communities. The County may continue to inform residents of the drought resources available⁵⁰ and provide information on nonprofits like Self Help Enterprises (SHE) for water storage tank deliveries, bottled water programs, water quality testing, and well assessments.

Direct Support

Agencies within Madera County and the San Joaquin Valley continue to directly support the communities impacted by drought with solutions such as interim water hauling and bottled water services. NGOs such as SHE have provided technical assistance and emergency solutions throughout Madera County. All of these services are subject to funding and availability.

Limitations and Challenges to Consolidation

Consolidation can be challenging when the customers of the subsumed system are reluctant to give up the independent autonomy of their system. There is an array of retained autonomy that comes from the spectrum of institutional arrangements, identified in **Figure 3-2** below, when considering consolidation. Depending on the arrangement, local control can differ. A realistic approach could start with a managerial option which can provide savings, the opportunity to build partnerships, and further develop relationships before fully moving towards a physical consolidation or regionalization approach.

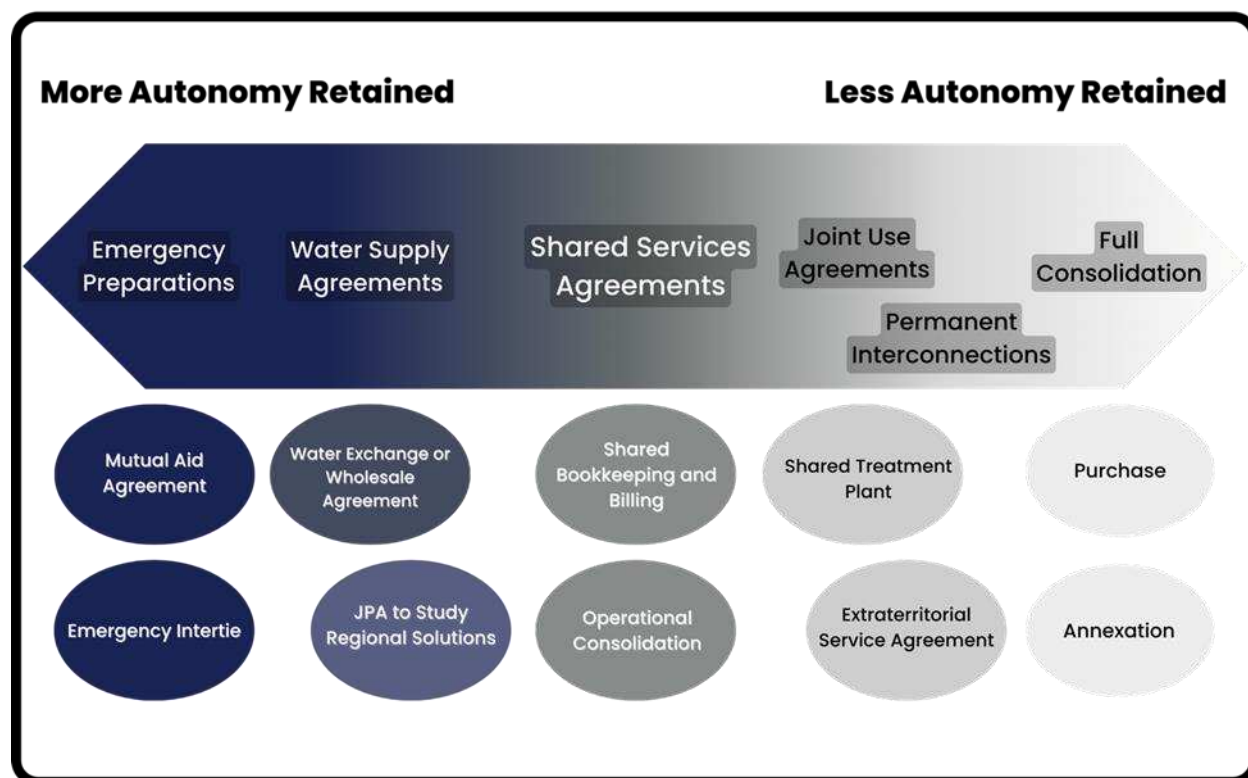
⁴⁹ Accessed at: https://www.waterboards.ca.gov/safer/funding_solicitation.html

⁵⁰ Information for Madera County available at: <https://www.maderacountywater.com/drought/>

However, funding mechanisms may be contingent upon the levels of consolidation. It is important to understand these tradeoffs when communities consider consolidation of their water system.

Consequently, a receiving system and its residents may resist consolidation efforts due to a reluctance to take on the debt, tax liability, or non-compliance penalties accrued by the small water system. These concerns highlight the necessity of accurate information on costs and benefits, local water security, and improved economies of scale for all systems involved in the consolidation.

Figure 3-2: Variation in Retained Autonomy of Small Water Systems for Institutional Arrangements⁵¹



3.3 OPPORTUNITIES FOR CONSOLIDATION

In 2020, Hillview Water Company, which had approximately 1,500 service connections in the Oakhurst, Raymond, and Coarsegold areas, was acquired by California American Water through managerial and voluntary consolidations.⁵² The County will focus its efforts on further identifying the communities susceptible to dry wells to promote and facilitate the managerial and/or physical consolidation processes. The Drinking Water System Outreach Tool⁵³ is an additional database which records

⁵¹ Nylen, N.G., Pannu, C., & Kiparsky, M., (2018).

⁵² State Water Resources Control Board. (n.d.). Drinking Water System Outreach Tool.

<https://gispublic.waterboards.ca.gov/portal/apps/webappviewer/index.html?id=70d27423735e45d6b037b7fbaea9a6a6>

⁵³ Accessed at:

<https://gispublic.waterboards.ca.gov/portal/apps/webappviewer/index.html?id=70d27423735e45d6b037b7fbaea9a6a6>

completed consolidation projects. This database may be helpful in determining future consolidation possibilities.

3.4 CONCLUSIONS AND NEXT STEPS

To support and navigate the coming challenges that drought will create on small water systems, the County (in accordance with department directives)) will continue to encourage water systems to take proactive steps to ensure resiliency, prepare for emergency situations, and respond to consolidation efforts. The County may assist with planning outreach and educational opportunities, and implement support strategies to provide interim and permanent solutions to assure water availability for communities.

4 Shortage Response Actions (Action Plan)

The County is not a large water purveyor directly responsible for managing water supplies or planning to ensure water supply reliability. The County does own and operate a small community water system. In addition, Maintenance Districts and Special Districts provide other legal and fiduciary responsibilities to assist with the general wellbeing of its residents – including the availability and reliability of water for human use and consumption. Before and during drought events, the County of Madera can take actions that improve the County’s preparedness for drought, reduce the risk of water shortages, and coordinate response actions to relieve drought impacts. SB 552 requires the County to provide emergency and interim drinking water solutions and consider domestic well drinking water mitigation programs. The focus of this Shortage Response Actions Plan (Action Plan) is on self-supplied communities (also called “rural communities”), which are supplied by water systems with 14 or fewer service connections, and domestic wells.

Section 4 – Shortage Response Actions of this Drought Plan is intended to be an “action ready” plan which can be used by County staff to coordinate actions before and during droughts. The Action Plan presented in Section 4 is organized in stages of increasing severity.

4.1 PRIMARY RISK FACTORS

As described in greater detail in Section 2 of this Drought Plan, the County has taken steps to assess potential drought and water shortage risk. The following risk factors represent the most serious threat to the reliability of water supplies for Rural Communities.

Declining groundwater levels

Over recent decades, groundwater subbasins within the County have experienced declining groundwater levels. Groundwater declines often accelerate during droughts and may not fully recover during normal or wet hydrologic periods. The GSPs for each of the three subbasins underlying the County have identified actions that should correct these declines and return groundwater levels to sustainability.

History of Well Failure

According to California Groundwater Live, there have been 658 dry wells reported in the County from 2014 to 2022. Of these, 100 have been resolved. This is likely an undercount, with more wells going dry than are reported to the State. The majority of recent well failures have occurred during the summer and fall months of severe drought years such as 2015 and 2021.

Dry Domestic Well Susceptibility

DWR has provided a tool on its GWLive portal that compares current groundwater level conditions to available information on domestic well locations and depths. According to this tool, the County contains many areas with a high dry domestic well susceptibility, including some areas above the 90th percentile of risk. Domestic wells that are relatively shallow compared to groundwater levels are at greater risk of going dry.

Domestic Wells in Fractured Rock Aquifers

In the eastern portion of the County in the Sierra Nevada foothills, domestic wells rely on groundwater drawn from fractured-rock aquifers rather than alluvial groundwater basins. The geology of fractured-rock aquifers is typically not well understood, and the total volume of water held in storage is less than alluvial aquifers, which makes the reliability of domestic wells in these areas difficult to assess. In many cases, groundwater availability in fractured rock areas may be more immediately impacted by the current year's hydrology than in areas with larger, deeper alluvial basins. Poor water quality is also a risk in these areas.

Social Vulnerability

Communities and individuals vary not only in their exposure to drought risks, but also in their ability to cope with impacts when water shortages occur. In particular, factors such as income, English fluency, age, education, and whether residences are rented or owner-occupied can all affect an individual's ability to access support and resources during water shortages. Based on DWR's risk tools, the County contains many areas which measure highly on one or more of these social vulnerability metrics, including specifically in areas which have a high degree of Dry Domestic Well Susceptibility. Furthermore, many areas also lack reliable broadband connectivity, especially in remote areas of the Sierra Nevada and Foothills, which adds challenges for the County to communicate risks and learn about outages.

4.2 TRACKING PROTOCOLS

Through the risk assessment and stakeholder engagement processes described in Section 2 of this Drought Plan, a number of key metrics were identified that can be used to measure drought and water shortage severity and trigger the response actions identified below. All the tracking protocols identified in this Drought Plan will be monitored on a regular, ongoing basis. The framework of tracking protocols and response actions is summarized in **Figure 4-1**.

Figure 4-1: Tracking Protocols and Response Actions Framework

Drought Stage	TRACKING MEASURE			Response Actions
	Groundwater Decline	Dry Wells Reports	Current Year Hydrology	
0	Less than 15 feet	Less than 4 reports	More than 80% of average San Joaquin River runoff	Baseline Actions
1	15 – 30 feet	5 – 10 reports	50 – 80% of average San Joaquin River runoff	Moderate Actions
2	More than 30 feet	More than 11 reports	Less than 50% of average San Joaquin River runoff	Severe Actions

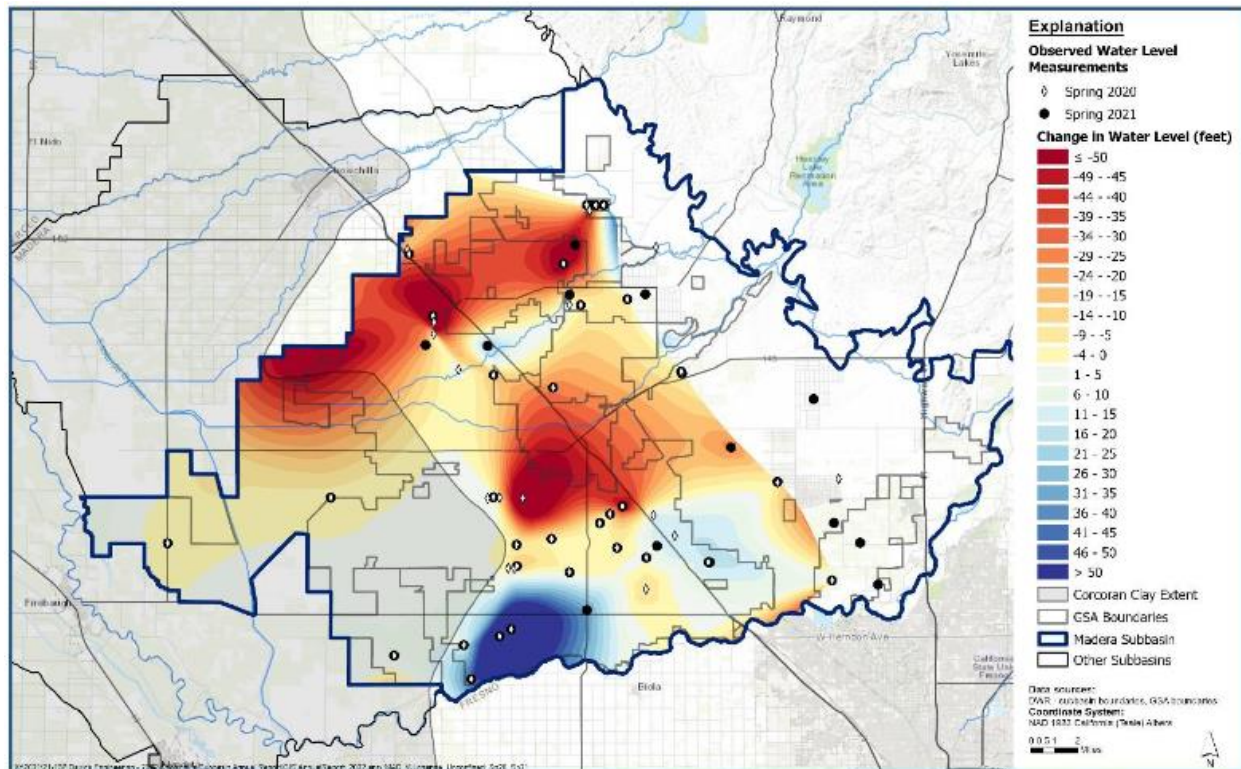
If a particular risk metric is found to be above a staged threshold, the County will activate the corresponding response action. If the tracking protocols described below indicate that a particular region within the County is experiencing the greatest risk of drought, response actions will be concentrated in that highest risk area. More information on the geographic focus of tracking indicators and response actions is presented in Section 4.2.4.

4.2.1 Groundwater level change from previous year in alluvial groundwater basins

Assessing current groundwater levels relative to the previous year’s conditions is of fundamental importance in predicting the risk of water shortage for self-supplied communities. If groundwater levels drop below the elevation generally accessed by domestic wells, there is significant risk to those wells running dry. Groundwater Sustainability Agencies (GSAs) within the County are assumed to be the organizations with the most accurate and up-to-date information on groundwater levels within their respective basins and will be key partners with the County in monitoring efforts. Each year by April 1, GSAs are required by SGMA to release their Annual Reports. In Madera County, the vast majority of groundwater users in alluvial basins are within the areas covered by either the Madera Subbasin Annual Report or the Chowchilla Subbasin Annual Report. In both subbasins’ Annual Reports, change in groundwater storage is presented in Section 6. An example of the Change in Groundwater Level Map this Drought Plan anticipates using is included as **Figure 4-2**, below.⁵⁴

⁵⁴ This image appears as Figure 6-1 in the Madera Subbasin April 2022 Annual Report. That report is available at: <https://www.maderacountywater.com/wp-content/uploads/2022/04/Madera-GSP-Annual-Report-WY2021-Final.pdf>

Figure 4-2: Example Groundwater Level Change Map



Change in Groundwater Level in the Upper Aquifer/Undifferentiated Unconfined Zone – Spring 2020 through Spring 2021.

It is assumed that most domestic wells access groundwater in the Upper/ Unconfined or Undifferentiated Aquifer.⁵⁵ County Staff can review maps depicting Change in Groundwater Level in each Annual Report to assess where in the County domestic wells may be at risk.

Stage 0 – Long Term Resiliency Actions

Groundwater levels in alluvial groundwater basins have increased, remained stable, or declined less than 15 feet since the previous year.

Stage 1 – Moderate Drought

Groundwater levels in alluvial groundwater basins have declined 15 to 30 feet from the previous year.

Stage 2 – Severe Drought

Groundwater levels in alluvial groundwater basins have declined more than 30 feet from the previous year.

⁵⁵ The Upper/ Unconfined or Undifferentiated Aquifer lies above the Corcoran Clay layer, a horizontally continuous aquitard found in the western portion of the San Joaquin valley generally 200–800 feet beneath the surface. Where present, the Corcoran Clay separates the groundwater subbasins into distinct upper (unconfined) and confined (lower) aquifers.

4.2.2 Dry Well Reports

Even outside times of drought, the County has historically experienced and will continue to experience a small number of Dry Wells Reports each year. Well age, lack of maintenance, and equipment failure can all cause wells to stop producing regardless of current drought conditions. However, recent history has shown that the number of dry well reports has spiked substantially during droughts, with serious water supply disruptions for the communities that rely on domestic wells. The State maintains a Dry Well Reporting System to gather information on well outages and connect individuals and communities with available aid and resources. The County will monitor the State's Reported Dry Well portal, and other information as available, and will trigger drought response actions if an uptick in the number of outages is detected. Effective communication with constituents, so County residents know how to report well outages, will also be an import strategy to ensure that Dry Well Reports remain an accurate indicator of drought impacts.

Stage 0 – Long Term Resiliency Actions

4 or fewer dry well reports are received in the County each month.

Stage 1 – Moderate Drought

5 – 10 dry well reports are received in the County each month.

Stage 2 – Severe Drought

11 or more dry well reports are received in the County each month.

4.2.3 Current Year Hydrology from Bulletin 120

The complex geology of fractured rock aquifers makes it impractical for the County to perform the regional-scale surveillance of groundwater conditions in the manner described above in Section 4.2.1 for alluvial groundwater basins. In addition, no other agencies, such as GSAs, exist in fractured rock areas that could share the burden of groundwater condition surveillance. It is assumed that fractured rock aquifers respond more readily to the current year's hydrology than alluvial aquifers, which are more affected by long-term multi-year trends. As the best readily available proxy of the risk of well failure in fractured rock aquifer areas, the County will monitor DWR's Bulletin 120 report each winter and spring. Specifically, runoff in the San Joaquin River watershed is assumed to be a good predictor of groundwater recharge (and thus well reliability for the upcoming year) in fractured-rock aquifer areas of Madera County. Bulletin 120 is prepared annually starting in February each year and is updated monthly from February through May.

Stage 0 – Long Term Resiliency Actions

Most recent Bulletin 120 Forecast of April through July Unimpaired Runoff in percent of historical average for the San Joaquin River is 80 percent or greater.

Stage 1 – Moderate Drought

Most recent Bulletin 120 Forecast of April through July Unimpaired Runoff in percent of historical average for the San Joaquin River is 50 – 80 percent.

Stage 2 – Severe Drought

Most recent Bulletin 120 Forecast of April through July Unimpaired Runoff in percent of historical average for the San Joaquin River is less than 50 percent.

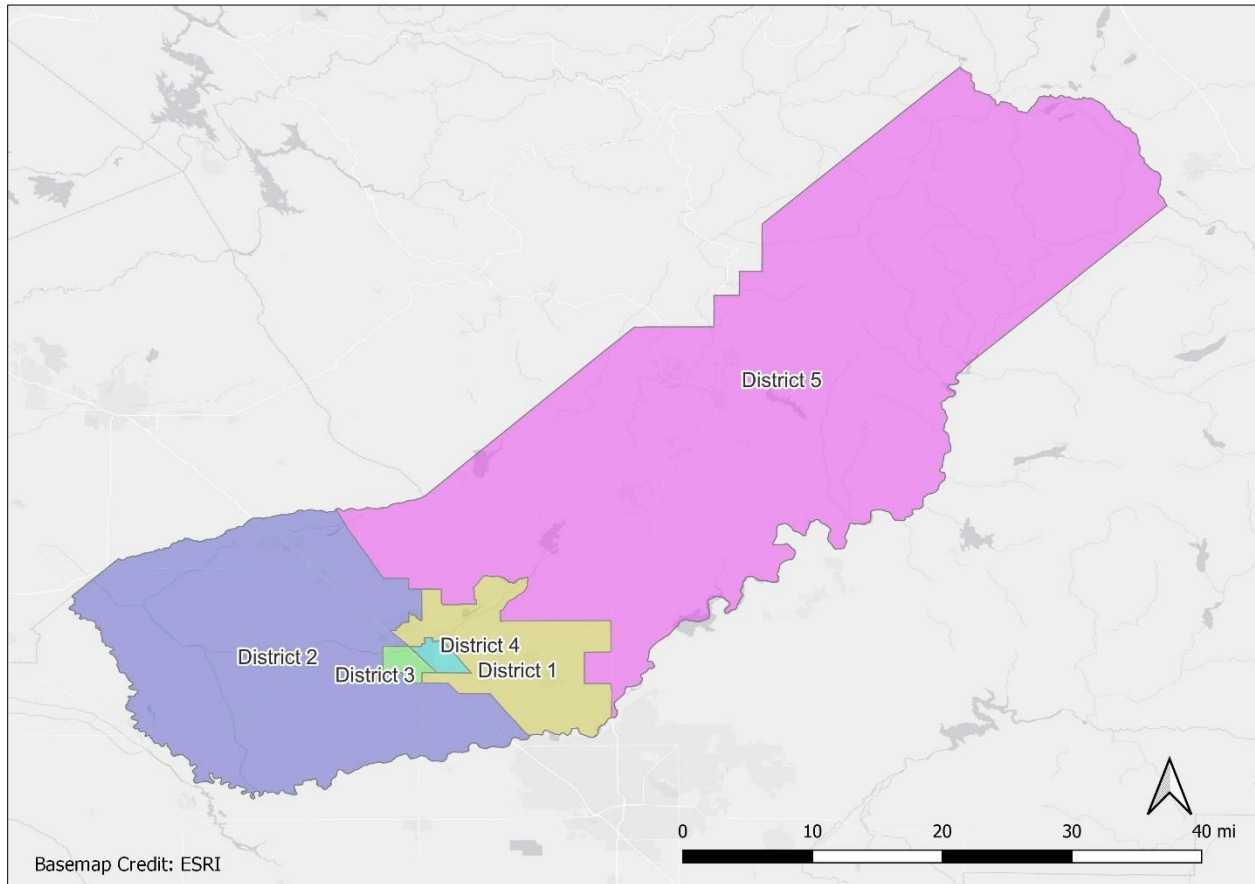
4.2.4 Geographic Focus Criteria

Monitoring protocols and response actions will be most effective if they allow the County to focus attention and resources on the areas with the greatest immediate risk of water shortage. The Drought Plan can attempt to narrow the geographic scope of its response actions in various ways. To preserve the operational flexibility of the Drought Plan and allow for situational judgement in the future, no single method for geographic focus is prescribed. Three potential options to help the County focus response actions are presented below, which may be refined or amended as the Drought Plan is implemented.

Option 1 – Madera County Board of Supervisor Districts

Madera County is divided into five Board of Supervisor districts of roughly equal population. The five districts correspond to district regions of the County, including the immediate vicinity around the City of Madera, the valley floor both east and west of Highway 99, and the Sierra Nevada Foothills and Mountains (see **Figure 4-3**). Focusing response actions within Board of Supervisor Districts would allow the County to use existing contact lists to help facilitate constituent communications.

Figure 4-3: Madera County Board of Supervisor Districts



Option 2 – Census Block Groups

Census Block Groups (the geographical unit used by the United States Census Bureau, typically between 600 and 3,000 people) are another readily available geographic unit that can be used to focus Drought Response Actions. Advantages of this approach include fairly high geographic specificity and ability to access the demographic data of each census block. **Figure 2-3** in Section 2 presents a snapshot of Census Block Groups in Madera County.

Option 3 – Set Radius Around Flagged Criteria Using GIS

Using GIS, it is simple to take a particular flagged risk criteria (such as the locations of dry wells, or areas with groundwater declines greater than a given threshold) and draw a radius around those areas. The resulting radius would then be used to help concentrate response actions in the high-risk area. The advantage of this approach is the high degree of geographic specificity, but disadvantages include greater County staff effort.

4.3 RESPONSE STRATEGIES

This section of the Drought Plan describes the response strategies the County can pursue to prepare for drought and provide interim and long-term solutions to water shortages. While SB 552 assigns new responsibilities to the County, the law does not directly provide new funds for the County to implement

its Drought Response Strategies. Therefore, many of the strategies described below focus on proactive surveillance of drought threats and coordination with partner organizations.

4.3.1 Stage 0 – Long Term Resiliency Actions

Drought preparedness is most effective when certain adaptive actions become an engrained way of life – not a reactive approach only implemented during emergencies. The shortage response actions are consistent with that philosophy and includes many response actions the County will pursue even when there is not a current drought. The Long-Term Resiliency Actions presented below form the foundation upon which the Emergency Response Actions listed in Section 4.3.2 and 4.3.3 build.

Monitoring and tracking protocols

The County will use the monitoring and tracking protocols described in the Section 4.2 of this Drought Plan to evaluate current drought and water shortage conditions in the County. The tracking protocols described in the prior subsection will be evaluated on at least an annual basis each spring and may be monitored more often during times of drought. The County Department of Water and Natural Resources is anticipated to be the lead based on budget availability and staff.

Coordination with GSA(s)

The County is the exclusive GSA for the portion of the Madera Subbasin and Chowchilla Subbasin in the undistricted land of the County. There are additional multiple GSAs within the Madera Subbasin, including the Madera County GSA, City of Madera GSA, Madera Irrigation District, Root Creek Water District, Madera Water District, Gravelly Ford Water District, New Stone Water District.⁵⁶ Other GSAs in the Chowchilla Basin include Chowchilla Water District, Triangle T Water District and Merced County.⁵⁷ Throughout the County, GSAs are assumed to be the organizations with the most accurate and up-to-date data regarding groundwater conditions within their respective subbasins. GSAs are also responsible for developing and implementing domestic well mitigation plans without their jurisdictions. Cross-agency coordination will involve regular communication, collaboration on areas of overlapping responsibility, and technical support and joint pursuit of grant funding where appropriate.

Constituent outreach and education

The goal of constituent education and outreach is that residents of the County who rely on domestic wells know what resources are available to assist them in preparing for and responding to drought. While this Drought Plan identifies key topics for education and outreach, it is anticipated that the development of a full Community Engagement Plan will be part of a future effort. Outreach will include several topics, which include but are not limited to:

- Long term maintenance of wells, which is crucial to well performance even when not challenged by acute drought. The GSAs and partner organizations such as Self-Help Enterprises may be able to provide assistance to disadvantaged well owners that need their domestic well evaluated or tested.

⁵⁶ Accessed at: <https://www.maderacountywater.com/madera-subbasin/>

⁵⁷ Accessed at: <https://www.maderacountywater.com/chowchilla-subbasin/>

- Reporting of outages, through the California Dry Well Reporting System. Partner organizations such as Self-Help Enterprises have historically assisted constituents with dry wells in navigating the reporting process and submitting accurate data.
- Process to request interim drinking water solutions such as bottled or tanked water.
- Tenant Rights regarding legally inhabitable residences. California Law requires dwellings to have “Plumbing facilities in good working order, including hot and cold running water, connected to a sewage disposal system.”⁵⁸ Many rental dwelling units in the County rely on domestic wells for water supply, and it is important for tenants to know their legal rights regarding a reliable water supply in a rented dwelling unit.

The County will make reasonable efforts to provide outreach materials in multiple languages and in appropriate formats. Communication materials, once developed, will be made available on the County’s Department of Water and Natural Resources website⁵⁹ and distributed through other venues, as identified, and deemed appropriate.

Encourage voluntary consolidations of Small Water Systems

While the County does not have the authority or desire to compel water system consolidations in most cases, the County recognizes the potential improvements in water service reliability that consolidation can provide (see Section 3). The County (in accordance with department directives) will work with small water systems to encourage voluntary mutual aid agreements, interties, or consolidations where appropriate and desired by all water systems involved.

Consider updating well permit and land use policies

Under its authority in well permitting and land use planning, the County has authority over installation of new wells and future residential development in its jurisdiction. The County may choose to review its existing policies and update them where appropriate to improve the resilience of future developments or to expand protection of domestic wells through more rigorous well construction standards (e.g. requiring protective minimum depths for well setting). The Community and Economic Development (CED) Division may review and update existing policies, such as Madera County Code Titles 13 and 14, covering water well permitting, but recommendations and modifications are outside the scope of this Drought Plan.

4.3.2 Stage 1 – Emergency Drought Response Actions

When the County determines that a drought or water shortage is occurring using the tracking protocols described above, the County can begin to implement emergency drought response measures. While these Actions are intended to address acute water shortages for Rural Communities, the County is limited to expanding outreach, facilitating access to State or federal funding, and helping constituents plan and prepare to be more resilient during future droughts. The County lacks the authority and the funding to resolve all impacts that may be experienced by Rural Communities and domestic well owners

⁵⁸ Civ. Code § 1941.1.

⁵⁹ Accessed at: <https://www.maderacountywater.com/>

during drought events. Rather, the emergency actions described below are intended to provide short-term assistance and information within the authority vesting in the County.

Initiate actions to access additional funding

While SB 552 adds new responsibilities for counties, the legislation does not provide a new funding source for counties to implement new programs.

The County has a Drought Budget of \$50,000 to \$80,000 annually, and has received a DWR grant of \$125,000 to assist with the implementation of the response actions identified in this Plan. However, for the Drought Plan to be most effective, additional funding sources will need to be accessed during emergencies. Potential funding sources include: FEMA Individual Assistance, FEMA Hazard Mitigation Funding, FEMA Building Resilient Infrastructure and Communities, IRWM grants, State Revolving Funds, other State and Federal Grant Funds, and State Small Water System reserve funds where applicable. Parallel to the efforts of the County, GSAs and CBO partners (e.g. Self-Help Enterprises) should also apply for additional emergency funding. When a drought emergency level has been triggered, the County will increase coordination with these other parties to assure all funding opportunities are vetted and pursued accordingly.

Implement drinking water solutions through partners

The County has historically obtained grant funding for emergency drinking water solutions, but these grants have included the requirements that the County partner with CBOs to deliver emergency services. Drinking water solutions have not historically been delivered directly to constituents by County staff, and it is anticipated that inter-organizational partnerships will continue to be necessary in the future. When the County determines that emergency drinking water solutions are needed, the County will notify its partner organizations (e.g. Self-Help Enterprises) to trigger pre-defined arrangements regarding responsibilities and coordination. Emergency drinking water solutions may include:

- Bottled water delivery
- Water tank placement and filling
- Well testing and repair

Targeted outreach to effected constituents

Using the tracking protocols and geographic focus criteria considered earlier in this Section, the County may identify particular constituents most at risk during a drought or water shortage. The County can then initiate targeted outreach to those particular communities and individuals. Communication materials may be multilingual and include information to inform stakeholders of heightened drought risk in their area and suggest voluntary demand reduction actions. It will be important to inform affected communities how to report dry wells, access emergency water supplies, and proactively request domestic well condition reports from stakeholders.

Emergency proclamation and declaration

Having an emergency proclamation in place at the County level can be helpful for raising public awareness of drought, placing restrictions and water conservation. A local emergency proclamation is

also a pre-requisite for obtaining a State Emergency Declaration,⁶⁰ which can, at the Governor's approval, can release additional funding for emergency response actions. An emergency proclamation can be declared by the Sheriff as the Director of Emergency Services. This proclamation would then have to be ratified by the County Board of Supervisors within seven days.

Consider extending well permit review timeline

The County has broad authority over the authorization of new well permits, including domestic, agricultural, and public water supply wells. The permitting process for review and approval currently takes 3-7 business days upon obtaining relevant documentation. Once approved, permits are issued and active for a period of 180 days (6 months). If needed, contractors can request a permit extension for an additional 60 days. In the case that a contractor lets a permit lapse, the permit can be renewed for an additional fee of 50% of the permitting cost.

SGMA requires all groundwater basins designated as high- or medium-priority to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans. Existing law authorizes a GSA to request of the County, and requires the County to consider, that the County forward permit requests for the construction of new groundwater wells, the enlarging of existing wells, and the reactivation of abandoned groundwater wells to the GSA before permit approval.⁶¹

During drought emergencies, it may be appropriate for the County to consider extending the well permit review timeline, to allow for ample time to forward all permit requests for the construction of new groundwater wells, the enlarging of existing groundwater wells, and the reactivation of abandoned groundwater wells to the GSA for review before permit approval.

Encourage voluntary demand reductions

While the County generally does not have the authority to mandate demand reductions⁶², the County can use its public communication pathways to encourage voluntary demand reduction efforts throughout all water using sectors. Voluntary demand reductions may be useful in reducing the pressure on limited water supplies such as shared groundwater resources.

Increase frequency of monitoring in identified high risk areas

Pursuant to Chapter 13 of the Madera County Code, the "permittee shall install a water flow meter and water level measuring device for each new water well and each replacement water well serving the parcel to measure groundwater usage and levels on the parcel... the permittee shall read and record the reading for the water flow meter. This data shall be provided to the water and natural resources department yearly (by November 15)."⁶³ The risk tracking protocols identified by Section 4.2 of this Drought Plan should be monitored more frequently during times of heightened drought risk (e.g. monthly versus annually), particularly in the specific geographic areas the County determines to be at highest risk. The County can continue to follow-up and assess drought risk, and reduce the frequency of monitoring when it determines that conditions have improved.

⁶⁰ Cal OES. (2022). *Proclamation Process*. Retrieved from <https://www.caloes.ca.gov/office-of-the-director/operations/recovery-directorate/interagency-recovery-coordination/proclamation-process/>

⁶¹ Authority of groundwater sustainability agency, Section 10726.4(b).

⁶² Maintenance Districts owned and operated by the County can mandate demand reductions.

⁶³ Madera County Code, Section 13.101.050, Reporting requirements.

4.3.3 Stage 2 – Additional Emergency Drought Response Actions

If the County (in accordance with department directives) assesses that drought conditions have continued to worsen, the County may pursue additional emergency drought response actions beyond those described above in Section 4.3.2.

Seek State Emergency Proclamation and Federal Emergency/Disaster Declaration

If not already in place, the County should seek a Gubernatorial State of Emergency Proclamation,⁶⁴ which can release additional funding for emergency response actions. Once the Governor has issued an Emergency Proclamation, the County may request that the Governor also seek a Presidential Declaration of an Emergency or Presidential Declaration of a Major Disaster. Federal-level declarations can release funding through FEMA that can support emergency response actions as well as long-term recovery efforts post-disaster. State and Federal proclamations and declarations should be pursued in accordance with the County's adopted Local Hazard Mitigation Plan.

Evaluate enforcement of renters' rights

Working with County Departments and the Board of Supervisors, the County may evaluate enforcement of renters' rights that may require landlords or property managers to address health and safety concerns, especially where rental properties have lost a domestic well and do not have access to drinking water. California Law requires dwellings to have "Plumbing facilities in good working order, including hot and cold running water, connected to a sewage disposal system." Madera County Environmental Health Division (EHD) is the designated Local Primacy Agency for enforcement of the state drinking water requirements with respect to small public water systems. The County may evaluate whether it is appropriate to deem certain rental dwelling units uninhabitable, even as a temporary determination until a water supply condition is rectified.

Consider temporary pause on new and replacement agricultural well permits

The County Board of Supervisors may, at its own discretion, consider a temporary pause on the issuance of new agricultural well permits, the enlarging of existing agricultural wells, and the reactivation of abandoned agricultural wells until drought conditions improve. Such a pause, if adopted, would continue to allow for replacement of existing domestic wells that have failed due to drought.

Implement mutual aid agreements as necessary

The County may facilitate the implementation of mutual aid agreements between public water systems and State Small Water Systems, as appropriate, to provide additional support and water supplies to struggling systems.

4.4 IMPLEMENTING THE ACTION PLAN

SB 552 requires that this Drought Plan provide "an analysis of the steps necessary to implement the plan" and "an analysis of local, state, and federal funding sources available to implement the plan."⁶⁵ Consistent with these requirements, the following section presents the County's anticipated

⁶⁴ Cal OES (2022)

⁶⁵ Water Code §10609.70 (b)

implementation staffing structure. As the County implements the Drought Plan, certain aspects may be adjusted based on operational judgement and experience.

4.4.1 County Department Responsibilities

The implementation of the Drought Plan will rely on coordination between multiple departments within the County as well as outside organizations.

County Department of Water and Natural Resources

Based on the availability of staff and funding, the Department of Water and Natural Resources (DWNR) will be responsible for ongoing monitoring of the Plan's tracking protocols, constituent communication, and coordination with other departments and organizations. At this time, DWNR has not yet obtained a new funding source to support new programs but will continue to coordinate with its partners to provide long and short-term drinking water solutions. DWNR may also collaborate with other County agencies to facilitate voluntary consolidations.

County Sheriff's Office of Emergency Services

The County Sheriff's Office of Emergency Services (Sheriff's OES) will be the lead agency within the County for this Drought Plan's Implementation of the Emergency Response Actions presented in Section 4.3.2 and 4.3.3.

County Environmental Health Division

Environmental Health Division (EHD) will continue to protect and promote the health and welfare of County residents and visitors by providing environmental health services through various programs including regulating small water systems, state small water systems, and the permitting of water wells.

Local Groundwater Sustainability Agencies

Local GSAs are already responsible under the requirements of SGMA for monitoring groundwater conditions in the subbasins within their jurisdiction and avoiding undesirable results. Additionally, GSAs are including Domestic Well Mitigation Plans in their GSPs. This Drought Plan anticipates that GSAs will be the primary agencies within the County responsible for ongoing monitoring and funding domestic well mitigation.⁶⁶ The County DWNR will coordinate data sharing between the County and GSAs.

California Department of Water Resources

DWR will support the implementation of this Drought Plan by maintaining its data portals (such as California's Groundwater Live and Dry Well Reporting Tool) and administering grants and other funding sources the County will access to support its continuing implementation.

Community Based Organization partners (e.g. Self-Help Enterprises)

Community Based Organization (CBO) partners are a critical piece of this Drought Plan, as it is anticipated that these partner organizations will be the direct providers of Drinking Water Solutions to

⁶⁶ Many GSAs' Domestic Well Mitigation Programs contain eligibility criteria, which may include the age of the affected well or its depth relative to minimum thresholds established by the applicable GSP. These criteria will limit which domestic wells are eligible for mitigation by the GSAs.

constituents, funded by grants awarded to the County. While Self-Help Enterprises (SHE) has historically been the key provider of bottled and tanked water in the County, this Drought Plan is intended to be flexible and not reliant on any specific CBO. The County's CBO partner will be responsible for delivery of emergency water; assisting constituents with well maintenance, testing, and reporting; and leveraging existing community relationships to assist the County in constituent outreach and education.

4.4.2 Financial Needs and Funding Sources

SB 552 requires that each county's Drought Plan consider an analysis of local, state, and federal funding sources available to implement the plan,⁶⁷ but SB 552 does not directly provide any new funding to help counties fulfill the law's requirements. Access to reliable funding is considered a major factor that will affect the long-term success and reach of the response strategies presented above.

Long-term funding strategies

The Department of Water and Natural Resources has been identified as the lead County department for the implementation and coordination of this Drought Plan, with assistance from the Sheriff's Office of Emergency Services (Sheriff's OES). It is anticipated that core functions of this Drought Plan, such as the staff time required to monitor tracking protocols and coordinate with partner agencies, will be supported by each department's available funding sources. Water and Natural Resources may also obtain additional funding through grants.

Currently, many emergency response actions are performed by community-based organization (CBO) partners (e.g. Self-Help Enterprises). These services are funded by grants administered by the SWRCB or by California DWR, including through the Safe and Affordable Drinking Water Fund (SADW Fund), the Safe and Affordable Funding for Equity and Resilience (SAFER), and the Small Community Drought Relief programs. It is assumed a similar funding structure will continue in the future, with grants from the State supporting the direct emergency response actions provided by CBO partners.

Groundwater Sustainability Agencies (GSAs) are discussing including Domestic Well Mitigation Programs in their GSPs as a mechanism to mitigate for groundwater overdraft conditions. GSAs are also empowered to charge fees to landowners within their jurisdiction in order to support the GSAs' programs, including domestic well mitigation. This Drought Plan anticipates that GSAs will shoulder the primary responsibility of funding Domestic Well Mitigation Programs in the portions of the County overlying groundwater basins regulated by SGMA.

For Small Water Systems in the County, the most sustainable funding source will continue to be the revenue generated by these systems' own customers through water rates. As discussed in Section 3 of this Drought Plan, technical, managerial, and financial (TMF) capacity remains a challenge for many of these small systems, but TMF is critical to long-term system reliability. Ultimately, changes to some of these small water systems' rate structures may be needed.

The County can consider providing information about technical assistance (TA) for small water systems interested in improving their finances and building reserve funding, but the County cannot and will not assume responsibility for funding these systems directly. The SWRCB's Office of Sustainable Water Solutions administers the TA program. Assistance Requests are submitted through the Division of

⁶⁷ Water Code § 10609.70 (b)(5)

Financial Assistance and TA is provided through TA Providers which are CBOs. Currently, Self-Help Enterprises is the TA Provider within the County.

Additional funding through grants

In addition to the long-term funding strategies listed above, there are a number of opportunities for various parties, including but not limited to the County, to apply for and obtain grant funding to support additional programs. A few of the currently available funding sources are identified below, but this Drought Plan encourages the County take advantage of other funding opportunities as they arise.

- SWRCB SAFER program – The Safe and Affordable Funding for Equity and Resilience (SAFER) program can fund key water actions, such as testing domestic well equipment, GIS database management, public outreach, creation of web resources, well inspection, and Point of Use/Point of Entry (POU/POE) treatment systems. SAFER grants can be applied for by the County, CBO partners, GSAs, and Water Systems.
- FEMA Assistance – the Federal Emergency Management Agency (FEMA) is a source of funding for victims of a natural hazard, be it an individual property owner or a water system. The County will not be the recipient of FEMA funds on behalf of the victims but can help provide information and recommendations to them about FEMA processes. FEMA assistance comes in a variety of forms, including Individual Assistance (after a disaster), the Hazard Mitigation Funding program, and the Building Resilient Infrastructure and Communities program.
- LandFlex – LandFlex is a new program offered by DWR to provide incentives to farmers to limit unsustainable groundwater pumping, leaving more water in the ground for drinking water wells. Groundwater Sustainability Agencies (GSAs) are the local government agencies that will be responsible for identifying vulnerable communities, applying for grant funding, and distributing the funding to participating farmers.⁶⁸
- Department of Conservation Multi-benefit Land Repurposing Program (MLRP) - The MLRP provides funding to landowners to fallow land and undertake habitat or other restoration activities. This program will increase regional capacity to repurpose agricultural land to reduce reliance on groundwater while providing community health, economic wellbeing, water supply, habitat, and climate benefits. The MLRP builds on the Voluntary Land Repurposing Program (VLRP) that is being developed in the Madera County GSA by repurposing lands in a way that maximizes co-benefits, including reducing flood risk or improving habitat.⁶⁹
- IRWM - The Integrated Regional Water Management (IRWM) program is a voluntary statewide planning and implementation program designed to incentivize regional collaboration among multiple water agencies towards the implementation of multi-benefit projects. In November of 2022, The California Department of Water Resources (DWR) released Funding Award recommendations for the current round of funding. The deadline for the current funding cycle is February 1, 2023. It is possible new funding will become available for additional application cycles through the IRWM program in the future.

⁶⁸ The Madera County GSA was awarded \$9.3 million through the LandFlex program in February 2023.

⁶⁹ The Madera County GSA received \$10 million in funding from the Department of Conservation.

5 Conclusions and Recommendations

This Drought Plan was prepared to fulfill the requirements of Senate Bill 552 (Drought Planning for Small Water Suppliers and Rural Communities, SB 552) and to prepare the County of Madera (“County”) for future droughts and water shortages. The Plan explores the Risk Factors (Section 2) that affect water supply reliability in the County. Voluntary water system consolidation can be one of the best methods available for decreasing risk exposure for small systems long term (Section 3). Other Response Actions that the County can pursue to mitigate drought risks and respond to shortages are presented as an Action Plan with tiered levels of response tied to increasing drought severity (Section 4).

The County has experienced serious droughts in the recent past, and many of the Response Actions presented in this Drought Plan are continuations of programs the County already has in place. One major benefit of this Drought Plan, beyond its role meeting the requirements of SB 552, is to document and formalize the County’s drought response strategy so the County is more prepared for future droughts. This Plan concludes with recommendations for immediate near-term actions, opportunities for improvement of the Plan, and commentary on the long-term vision for drought preparedness in the County.

5.1 IMMEDIATE NEAR-TERM ACTIONS

For this Drought Plan to be most effective, there are a number of actions the County can take in the immediate near term to enhance its preparedness for future drought. Those actions are as follows:

Coordination between departments within County and with outside organizations

Because the responsibility for this Drought Plan is spread across multiple County departments and outside organizations (Section 4.4.1), communication and coordination are crucial. The County should ensure that it has current contact information for all points of contact at the agencies listed in Section 4.4.1 and maintain such a list as an attachment to this Drought Plan. The existing structure of the Madera County Drought Workgroup can be leveraged to advance this coordination. Any agencies that do not regularly attend the monthly Drought Workgroup meetings should be encouraged to attend.

Begin Long-Term Resiliency Actions

When the Drought Plan is finalized, County staff may begin to conduct the Drought Plan’s Long-Term Resiliency Actions (Section 4.3.1). These Actions include monitoring and tracking protocols, coordination with GSAs, constituent outreach and education, encouraging voluntary water system consolidations, and considering updating well permit and land use regulations.

Pursue new funding sources

As discussed in Section 4.4.2, reliable funding is a key factor that will affect the implementation of this Drought Plan. Once complete, the County can consider applying for grants to obtain additional funding (or encourage its agency partners to apply). Potential funding sources include SWRCB’s SAFER program, FEMA Hazard Mitigation and Building Resilient Infrastructure and Communities programs, LandFlex, and IRWM. Other funding sources, beyond those identified by this Plan, should be considered and pursued when appropriate.

5.2 OPPORTUNITIES FOR IMPROVEMENT AND LONG-TERM VISION

This Drought Plan is intended to function as a living document and should be revisited and revised periodically (e.g., bi-annually) after completion of this initial plan. Certain risk indicators, tracking protocols, thresholds, or response actions may require adjustment as conditions in the County evolve and Staff gain experience using the Drought Plan. As the Plan is implemented, the County may identify further opportunities for improvement.

One specific opportunity for future improvement involves the documentation of institutional knowledge. The County has recently experienced severe droughts that have caused serious water supply challenges for Rural Communities, and the County has been forced to find emergency solutions. As a result, many County staff members have built up valuable institutional knowledge which is a major asset when responding to future droughts. This Drought Plan should consider adding, as an addendum, documentation of staff institutional knowledge. This could take several forms, including transcribed interviews, survey results, or one-page fact sheets on specific topics. Key topics that should be documented include lessons learned, effective communication strategies, and operational challenges that could potentially be fixed.

Ultimately, drought and water supply challenges are an unavoidable hazard in Madera County and California more broadly, and these hazards may intensify in the future due to climate change. The goal of this Plan is to improve communities' resilience to drought, but even if this Drought Plan is successful, drought hazards will continue to occur. This Drought Plan is most effective as part of a larger framework, including Groundwater Sustainability Plans (GSPs) and the County's Local Hazard Mitigation Plan (LHMP). Taken together, these plans can reduce County communities' exposure to risk and prepare the County to respond proactively and effectively when challenges occur.

**BEFORE THE
BOARD OF SUPERVISORS FOR THE
COUNTY OF MADERA**

In the Matter of

CALIFORNIA SENATE BILL 552

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)
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Resolution No.: 2021 - 158

**RESOLUTION ESTABLISHING COUNTY
OF MADERA'S ALTERNATIVE PROCESS
FOR SENATE BILL 552**

WHEREAS, on September 23, 2021, Senate Bill 552 ("SB 552") was signed into law by the Governor of the State of California, which added Section 10609.70 to the Water Code, requiring a county to establish either (1) a standing drought and water shortage task force to facilitate drought and water shortage preparedness for state small water systems and domestic wells within the county's jurisdiction, or (2) an alternative process that facilitates drought and water shortage preparedness for state small water systems and domestic wells within the county's jurisdiction, as provided; and

WHEREAS, SB 552 states that the "alternative process shall provide opportunities for coordinating and communicating with the state and other local governments, community-based organizations, local water suppliers, and local residents on a regular basis and during drought or water shortage emergencies;" and

WHEREAS, the Department of Water and Natural Resources for the County of Madera ("County") currently coordinates with different departments within the County as well as non-governmental organizations (NGO's), cities, irrigation districts, water districts, resource conservation districts ("RCDs"), and state and federal agencies with respect to addressing the effects of the current drought in California; and

WHEREAS, for the “alternative process” under SB 552, the Department of Water and Natural Resources shall coordinate and communicate with the state and other local governments, community-based organizations, local water suppliers, and local residents on a monthly basis during drought or water shortage emergencies, so as to facilitate drought and water shortage preparedness for state small water systems and domestic wells within the County’s jurisdiction.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors for the County of Madera as follows:

1. The above Recitals are hereby incorporated by reference and are made a substantive part of this Resolution.
2. The Director of the County Department of Water and Natural Resources (“Department Director”) is hereby authorized and directed to take all measures in furtherance of, and consistent with, this Resolution.

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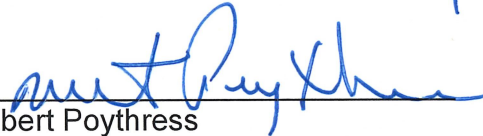
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The foregoing Resolution was adopted this 7th day of December, 2021, by
the following vote:

Supervisor Frazier voted:	<u>YES</u>
Supervisor Rogers voted:	<u>YES</u>
Supervisor Poythress voted:	<u>YES</u>
Supervisor Gonzalez voted:	<u>YES</u>
Supervisor Wheeler voted:	<u>YES</u>


Robert Poythress
Chairman, Board of Supervisors

ATTEST:


Clerk, Board of Supervisors

Approved as to Legal Form:
COUNTY COUNSEL

Michael R.
By Linden

Digitally signed by: Michael R.
Linden
DN: CN = Michael R. Linden
email = mlinden@lozanosmith.
com C = US O = LOZANO SMITH
Date: 2021.12.02 13:57:39 -08'00'

Attachment B**Contact List - External Stakeholders****Madera County Drought Workgroup**

Name	Organization/ Agency
Adriana Becerra	Self-Help Enterprises
Alex Davis	Coarsegold Resource Conservation District
Amy Siliznoff	Madera/Chowchilla Resource Conservation District
Ana Ibanez	Community Action Partnership of Madera County (CAPMC)
Andrea Uribe	Leadership Counsel of Justice and Accountability
Angela Islas	Civic Well
Armando Ortiz	Self-Help Enterprises
Aysha Massell	Sustainable Conservation
Barbara Nelson	Fairmead Community and Friends
Becky Horn	Water Wise
Carson Gordon	Self-Help Enterprises
Christina Beckstead	Madera County Farm Bureau
Christina Garcia	Self-Help Enterprises
Christine Thomas	Self-Help Enterprises
Colin Mckellar	NOAA-Hanford
David de la Cruz	Self-Help Enterprises
Eddie Ocampo	Self-Help Enterprises
Elaine Moore	Fairmead Community and Friends
Emily McCague	Self-Help Enterprises
Felix Castro	NOAA-Hanford
Jack Rice	Western Resource Strategies LLC
Jacob Roberson	Madera Regional Water Management Group
Jasmine Rivera	Self-Help Enterprises
Jon Cottingham	Coarsegold Resource Conservation District
Joseph Choperena	Sustainable Conservation
Josue Medellin-Azuara	UC Merced, Water Systems Management Lab
Juan Cano	Self-Help Enterprises
Julie Konno	Coarsegold Resource Conservation District
Keith Helmuth	City of Madera
Kent Stahl	Self-Help Enterprises
Lacey McBride	Merced County
Laura Ramos	California Water Institute, Fresno State
Leticia Casillas	Leadership Counsel of Justice and Accountability
Madeline Harris	Leadership Counsel of Justice and Accountability
Mark Hutson	Landowner/Farmer-Madera County
Mary Stalter	North Fork Rancheria of Mono Indians
Melissa Looney	Self-Help Enterprises
Nicole Winn	Self-Help Enterprises
Noah Lopez	Western Resource Strategies LLC
Paul Provenzano	Member of the Public- Madera Ranchos
Sarge Green	Center for Irrigation Technology, Fresno State
Sonia Sanchez	Self-Help Enterprises
Stephanie Mercado	Self-Help Enterprises
Sue Ruiz	Self-Help Enterprises
Tamy McVay	Self-Help Enterprises
Thania Bejarano	Self-Help Enterprises
Travis Wentworth	Self-Help Enterprises
Vickie Ortiz	Fairmead Community and Friends

Attachment B**Contact List - Internal Stakeholders****Madera County Drought Workgroup**

Name	Organization/ Agency
Aleta Allen	Madera County Water and Natural Resources
Allison Medley	Madera County Water and Natural Resources
Dexter Marr	Madera County Environmental Health
Emily Garcia	Madera County Water and Natural Resources
Jacinta Cabral	Madera County Water and Natural Resources
Jeannie Habben	Madera County Water and Natural Resources
Jenny Nunez-Rodriguez	Madera County Water and Natural Resources
Joseph Wilder	Madera County Sheriff's Office -Sheriff's OES
Juan Witrigo	IT Madera County
Karla Estupinian	Chief of Staff to Leticia Gonzalez
Kevin Sischo	Madera County Water and Natural Resources
Kim Witten	Madera County Water and Natural Resources
Leticia Tapia	Madera County Water and Natural Resources
Matt Skolnik	Chief of Staff to Supervisor David Rogers
Melissa DaSilva	Chief of Staff to Supervisor Brett Frazier
Mika Flores	Chief of Staff to Supervisor Jordan Whamhoff
Monica Roath	Madera County Environmental Health
Nick Salinas	Chief of Staff to Supervisor Robert Poythress
Robert Macaulay	Chief of Staff to Tom Wheeler
Rusty Lantsberger	Madera County Ag Commissioner
Samuel Cunningham	Madera County Water and Natural Resources
Stephanie Anagnoson	Madera County Water and Natural Resources
Tukta Phetasa	Madera County Water and Natural Resources

Attachment B
Drought Plan Development Participation
Madera County Drought Workgroup

Name	Organization/ Agency
Brandon Tomlinson	Chowchilla Water District
Dina Nolan	Madera Irrigation District
Don Roberts	Gravelly Ford Water District
Roy Catania	Aliso Water District GSA

Attachment B
Drought Plan Development Participation
Madera County Drought Workgroup

Name	Organization/ Agency
Aaron Button	State Water Resources Control Board
Abigail Solis	Office of Governor Gavin Newsom- Central CA Director of External Affairs
Adriana Renteria	State Water Resources Control Board
Benjamin Brezing	California Department of Water Resources
Caroline Hackett	State Water Resources Control Board
Emily Houlihan	State Water Resources Control Board
Jeffrey Albrecht	State Water Resources Control Board
Julie Ekstrom	California Department of Water Resources
Kristyn Abhold	State Water Resources Control Board
Maria Herrera	Office of Governor Gavin Newsom- Past Central CA Director of External Affairs
Natalie Stork	State Water Resources Control Board
Shane Edmunds	California Department of Water Resources
Steve Doe	California Department of Water Resources
Steven Springhorn	California Department of Water Resources

Attachment C

Madera County Drought Workgroup Meetings

Pre SB 552 Plan Meetings:

1. **June 25, 2021** – Discussion of Goals and Purpose, Status of the Drought and Resources
Presenters: Madera County Water and Natural Resources and Self- Help Enterprises
2. **July 20, 2021** – Drought Resources
Presenters: Self-Help and the Madera County Farm Bureau
3. **November 3, 2021** – What Homebuyers and Realtors Should Know About Private Drinking Wells
Presenter: Steven Wilson, Program Director – PrivateWellClass.org.
4. **December 3, 2021** – SB 552 Discussion and the CA Partnership for the San Joaquin Valley Water Work Group
Presenters: Madera County Water and Natural Resources staff and Laura Ramos from the CA Water Institute (Fresno State)
5. **January 21, 2022** – Water Emergency Services and Drought Tools
Presenters: Melissa Looney from Self-Help Enterprises and Madera County Water and Natural Resources Staff
6. **February 18, 2022** – Overview of the CA DWR and Presentation of Tools from DWR
Presenters: Steven Springhorn and DWR Staff
7. **March 18, 2022** – Drought Update
Presenter: Colin McKellar – NOAA Hanford
8. **June 17, 2022** – Irrigation and Advanced Pumping
Presenters: Sarge Green – California Water Institute (Fresno State)
9. **July 15, 2022** – Economic Impacts of the Drought to the CA Agriculture
Presenter: Josue Medellin-Azuara – UC Merced
10. **August 19, 2022** – Announcement of Plan Preparation and Invitation to Engage in Plan Development
Presenter: Frank Lyles and Greg Young – Zanjero Group
11. **September 16, 2022** – Stakeholder listening session regarding Risk Factors and Tracking Protocols
Presenters: Frank Lyles and Greg Young – Zanjero Group
12. **October 21, 2022** – Stakeholder listening session regarding Response Actions
Presenters: Frank Lyles and Greg Young – Zanjero Group
13. **November 18, 2022** – Private Wells Maintenance and Resources
Presenters: Laura Ramos and Cordie Qualle – California Water Institute (Fresno State)
14. **January 20, 2023** – Presentation of Draft Drought Plan to the Drought Workgroup
Presenters: Frank Lyles and Greg Young – Zanjero Group
15. **January 23, 2023** – Presentation of Draft Drought Plan to the Regional Water Management Group

Drought Workgroup Meetings Subsequent to SB 552 Plan Development

16. **February 17, 2023** – Water Testing
Presenter: Si Noon Hong – Madera County Public Health Department
17. **March 17, 2023** – Water Emergency Services

Presenter: Self-Help Enterprises Staff

18. **April 21, 2023** – Atmospheric River, Drought and Flood

Presenters: NOAA Hanford Staff

19. **May 1, 2023 – May 31, 2023** – Open comment period for Public Review Draft of Drought Plan

20. **May 19, 2023** – Presentation of Draft Drought Plan to the Drought Workgroup

Presenters: Frank Lyles and Greg Young – Zanjero Group

21. **August 18, 2023** – Wildfire and Wells

Presenters: Monica Roath and Dexter Marr, Madera County Environmental Health Division

22. **November 17, 2023** – Drought Update and Water Emergency Services

Presenters: NOAA Hanford and Self-Help Enterprises

23. **March 8, 2024** – Health Impacts from the Drought in the San Joaquin Valley

Presenters: Central California Public Health Consortium

24. **June 21, 2024** – Natural Climate Solutions for Building Water and Watershed Resilience in CA

Presenter: Safeeq Khan, UC Merced

25. **September 27, 2024** – Drought Conditions and El Nino/ La Nina Updates

Presenter: Felix Castro, NOAA Hanford

26. **November 12, 2024** – Presentation of Final Drought Plan to County Board of Supervisors